

**Washington Department of Natural Resources
Forest Practices
Compliance Monitoring Program**



**Standard Sample Field Protocols
Western and Eastern Washington
2024**

Edited for 2024 by Compliance Monitoring staff:

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Overview

This document serves as instructions and as reference for the Compliance Monitoring sample preparation and field data collection, describing field protocols for the Compliance Monitoring Program (CMP). This revision succeeds previous versions of “Compliance Monitoring Protocols - Western and Eastern Washington” beginning in 2007. This document complements the Forest Practices Compliance Monitoring Program Design providing those detailed protocols be conducted on selected segments of Forest Practices Applications (FPAs). Protocols for sample selection are contained in the Compliance Monitoring Program Design document. Protocols for pre-field season FPA screening are contained in the *2024 FPA Screening Instructions* document.

The following pages contain guidance on how to conduct Compliance Monitoring field reviews in a repeatable manner to promote consistency in sampling. However, it is understood that modifications may be made to the protocols as local site conditions warrant.

The core review team that shall be present on any Compliance Monitoring field visit consists of a DNR Forest Practices representative and at least one other representative from either the Department of Ecology (ECY), a tribe, or a second DNR Forest Practices representative working within a separate chain of command from the first. For example, a field review may be considered valid when two members of the review team consist of the DNR Compliance Monitoring Field Coordinator and a local DNR Forest Practices Forester. Another example may include the presence of the Compliance Monitoring Program Manager and a tribal biologist.

The [Compliance Monitoring SharePoint webpage](#) provides information for participants pertaining to FPA scheduling, segment selections, field forms, other relevant resources, and topics regarding Compliance Monitoring field reviews. Please contact the Compliance Monitoring Program Field Coordinator to gain access to the SharePoint page.

Participant Responsibilities for Compliance Monitoring Field Reviews

Responsibilities of participants for Compliance Monitoring field reviews vary by agency/affiliation as detailed below.

DNR Forest Practices Division Compliance Monitoring Program Staff

- The CMFC will coordinate all field reviews with the DNR Region Compliance Monitoring liaison. Weeks for fieldwork within each DNR region will be chosen at the Compliance Monitoring Annual Field Kick-off Meeting.
- The CMFC will post all field dates, FPA numbers, and segment selections on the Compliance Monitoring SharePoint webpage. The goal is to provide at least two weeks' notice on the SharePoint site; however, in some circumstances, less than two weeks' notice may be given. The CMFC will notify region liaison via phone call, voicemail message, or email in the event a field review is rescheduled or substantially changed with less than two weeks of notice. The region liaison is responsible for ensuring the updated information reaches all affected participants.
- The CMFC will distribute to other participants any pertinent information given to them by the DNR region liaison. This is usually accomplished by inclusion in the schedule or calendar information on the SharePoint webpage.
- The CMFC will try to minimize travel by encouraging applications near each other to be reviewed within the same day/week when possible.
- CMP staff, typically the CMFC, will be the DNR lead on all field reviews for which they are present.

DNR Forest Practices Staff and Region Liaison

- Region Forest Practices (FP) field staff or the DNR region liaison will contact all landowners and field participants (ECY, DNR staff, and affected tribes) to set up a field review date, as well as determine meeting time and location, and other logistical support as needed. Liaisons will relay any changes or cancellations regarding site visits to all field participants.
- Region liaison will check, or ask the approving Forest Practices Forester (FPF) to check the office FPA paper file and the FPA jacket to gather all information on the FPA such as Informal Conference Notes (ICNs), Water Type Modification Forms (WTMFs), protocol surveys, forester log notes, emails, etc. It is preferable that this information be emailed to the CMFC at least one week before the field review.
- If the region liaison cannot attend, they will arrange for another representative from the region to attend in their place.
- While the FPF is not required to attend, their presence is encouraged to help clarify elements of the FPA. The approving FPF may participate with the on-site data collection but may not participate in making compliance determinations for the review.
- A member of DNR Region Forest Practices staff may act as the DNR lead for a field review when CMP staff are not present. The approving forester for an FPA may not lead its field review.

DNR Lead for Field Review

The DNR lead has the final determination in all decisions made in the field after having considered all input from stakeholders. The DNR lead for field reviews is the Compliance Monitoring Field Coordinator (CMFC) or Program Manager (CMPM), or DNR Region Forest Practices Compliance Monitoring liaison when neither the CMFC nor CMPM are present. Region staff may not lead field reviews for FPAs of which they were the approving forester.

- DNR lead ensures protocols are followed, or that departures from protocols are properly documented after all input from stakeholders has been received and considered.
- DNR lead will read form questions aloud before making final compliance determinations.
- DNR lead will bring the appropriate field forms for the prescriptions selected for review.

Department of Ecology, Department of Fish and Wildlife, and Tribal Personnel

- Maintain availability for scheduled field reviews. Check SharePoint calendar for scheduled field review days.
 - If agency representative is unable to attend a scheduled field day, the representative should seek a substitute attendee from their respective agency if possible, and communicate that to the CMFC, CMPM, or region liaison. This includes absences for annual or sick leave, trainings, or meetings, even if these are on the calendar in advance of scheduling a field review.
 - Field review will take place as long as the DNR and a representative from ECY, tribe, or additional DNR representative from a separate chain of command from the first are present.
- If necessary, ask the CMFC or CMPM for additional information about an individual FPA under review. They will be the point of contact for receiving information regarding ICNs, WTMFs, etc. Place all requests for additional information through them.
- Come prepared with necessary field gear. It is expected that all attendees will have the required personal protective equipment (hard hat, high visibility vest, and caulk boots), as well as the necessary field equipment (diameter tape, laser rangefinder, clinometer, permanent markers, field notebook, etc.). CMP staff may have some extra equipment available for use during the field review.
- Participate in field measurements following the protocols and instructions from DNR lead.
 - Concerns over conduct of fieldwork will be brought to the attention of the DNR lead as soon as possible.
 - If an agency representative has concerns that are not properly addressed by the DNR lead, contact the CMPM. The CMPM should initiate an Agency Caucus meeting (refer to “Decisions” under *General Field Procedure Information* below for more information). If the CMPM’s answer, or the answer resulting from the Agency Caucus meeting is not satisfactory, follow the process below:
 - Provide a detailed written description of the nature of the dispute, including basis for disagreement with the DNR lead’s position on the matter, to the Assistant Division Manager – Operations (ADM-Ops). Division will take the lead in providing a response to the concerned party

in writing within five business days of receipt. The individual(s) bringing the dispute may then elect to either accept the division answer, request a meeting with the ADM-Ops and accept the answer/outcome of this meeting, or pursue other means of resolution. The party initiating this process should do so following their chain of command in order to elevate the dispute to the ADM-Ops.

- Provide copies of all field notes recorded during the review to the CMFC for inclusion into the file. This will be done by the first available office day after the review has taken place.

General Expectations – All Participants

- Always consider your own safety, as well as the safety of others on the team during field reviews. Look up, down, and around. Be mindful of weather conditions, footing on steep slopes, and blowdown. Practice safe driving habits, especially when following in a convoy. Speak up if you are uncomfortable with a field assignment, and the DNR lead will take action to mitigate the issue.
- Demonstrate professional behavior at all times. It is vital to be respectful, especially while listening to or offering dissenting opinions. Be courteous toward landowners and treat them with respect. Professional relationships will be maintained by all participants during field reviews.
- Read and be familiar with the protocols. Additional training during field reviews is always available and questions are encouraged.
- Be familiar with FPAs selected for review. Conduct a thorough office review of the FPA prior to field visit.
- Request clarification or further information from Compliance Monitoring staff if needed.
- Be mentally and physically prepared for fieldwork.
- Be flexible. FPAs will be dropped, schedules will change, people will get sick, and emergencies will arise. Although DNR CMP staff work to mitigate these issues, we occasionally may not be successful.

Standard Sample Prescriptions

The following are the **standard sample** prescriptions* assessed in Compliance Monitoring:

- No Inner Zone Harvest (NIZH)
- Desired Future Condition Option 1 (DFC1)
- Desired Future Condition Option 2 (DFC2)
- Np streams
- Ns streams
- Non-Forested Wetlands (Type A & B Wetlands)
- Forested Wetlands
- Roads (new construction, abandonment, and culvert installation/replacement)
- Haul Routes

**Note: Standard sample prescriptions are subject to change and will be updated as needed.*

Periodic Samples

A periodic sample is of a prescription or activity outside of the annually assessed standard sample prescriptions listed above. These might occur infrequently or have different rule elements than the prescriptions included in the standard sample. They might also involve situations in which historical results from the standard sample have indicated rules that warrant closer scrutiny. Though the “Participant Responsibilities for Compliance Monitoring Field Reviews” and “General Field Procedure Information” sections may apply to these samples, additional protocols may be needed to account for differences between standard sample prescriptions and periodic sample prescriptions. Please review individual periodic sample protocols for specific information regarding sampling methodology.

General Field Procedure Information

- DNR leads all field reviews. Refer to *DNR Lead for Field Review* section above for more detail.
- DNR staff and other agencies involved in a review are never allowed to trespass on adjacent landowner property, even with permission from the adjacent landowner. If review of a particular segment is hindered because of this, it should be dropped, and the next random segment selected. If no additional segments are available, the prescription will be dropped from the review and a replacement will be selected for review from a different FPA. Participants may leave the FPA boundary if the land outside the FPA is owned by the same entity.
- DNR lead, after considering input from ECY and tribal representative(s), has the final decision in accepting any documentation, allowing any departures from protocols, making the compliant/deviation determination, and deviation severity rating.
- Prior to beginning field measurements, DNR lead shall conduct, and all present shall participate in, a pre-review briefing.
 - DNR lead will brief participants on prescriptions for review and the operational tactics surrounding the data collection.
 - DNR lead will assign work roles to participants, keeping in mind the need to reduce potential positional bias and taking any physical limitations (or preferences, when possible) into account. Landowners in attendance are welcome, but not required, to participate in measurement activities.

Field Discussions and Decisions

Discussions

- When facilitating discussions regarding specific Forest Practices rules, bankfull width (BFW) determinations, wetlands, or other topics associated with FPA review:
 - All field participants will be included in the discussion.
 - The DNR lead will facilitate discussions whereby all participants are allowed and encouraged to voice their opinions.

- Discussion will be kept to approximately 15 minutes to keep the process moving. DNR lead will make final decision.
- WTMFs, ICNs, protocol surveys, other supporting documentation, and stream typing.
 - If documentation supporting a stream typing decision is submitted with an application or provided to the DNR lead before or during the review, the CMP will not challenge stream typing, provided that the survey or Inter-Disciplinary (ID) team referenced in the documentation was conducted on or after March 20, 2000.
 - If supporting documentation is not submitted before or during the review, the initial compliance determination will be made based on physical characteristics of the stream (refer to Appendix B for more information). Compliance determination will be changed if the documentation is provided shortly after the field visit. In this case, written comments should outline the current compliance determination, and how that may change after submission and review of proper documentation.
 - Fish observed in a stream identified as non-fish need to be confirmed by at least two members from the field team.
 - If fish are observed in a water segment that is classified as non-fish, the water segment will be considered not compliant for typing and all other rule questions will become not applicable (N/A). Record this type of information on the field form for inclusion in the file.
 - i. In this scenario for Np streams, the “typing” rule question (question one on Np form) becomes not compliant and all subsequent rule questions on the Np form are N/A. The team will then assess the rest of the stream segment for FPA compliance with the Np prescription.
 - ii. In this scenario for Ns streams the “typing” rule question (question one on the Ns form) becomes not compliant and the subsequent rule question is N/A. Question two will be assessed for FPA compliance with the Ns prescription, if applicable.
 - iii. If fish are observed or have the physical capability to inhabit a selected Type A, Type B, or forested wetland via a connected Type F or S stream, the “typing” question (question one on non-forested and forested wetlands forms) becomes not compliant and the subsequent rule questions become N/A. The wetland prescriptions will then be assessed for FPA compliance.
 - If a landowner is claiming a type N stream on an FPA and the same stream is identified as type F on the DNR hydro layer, physical criteria or protocol survey and completed water type worksheet must be included with the FPA for the landowner to be compliant with the Forest Practices water typing rules.

Decisions

- Every effort must be made to make compliance determinations in the field. If compliance calls or ratings are to be changed based on new information that comes to light after the field teams have signed off on the results, the new information will be presented to the field review participants so they can review the change and provide their concurrence or non-concurrence (dissenting opinion). The change will be documented on the field form.

- Decisions that cannot be immediately made in the field must be documented, including the plan for a final determination to be made after additional information has been gathered and evaluated.
- Representatives from DNR, ECY, WDFW, and affected tribes should sign the field form. If any party holds a dissenting opinion, they should either write their own opinion or initial next to the CMFC's transcription of their opinion, but still sign the form at the appropriate line. If no dissenting opinion is written, signing on the appropriate line will indicate agreement with the decisions included in the form.
- Dissenting participants should bring the issues to their respective representatives at the stakeholder/policy level for any further discussion or action that might be needed.
- Overprotection of a resource (site classes reported higher than mapped, stream size reported larger than observed, higher order typing, etc.) will be considered compliant.
- DNR lead shall present all issues regarding rules or specific interpretations to the CMPM for clarification within the Forest Practices Division.
 - CMPM will promptly reply to the field team with results of consultation. Basis for decision(s) will be included in the reply.
- The dispute resolution process will include CMP Agency Caucus meetings. Members of this Caucus include:
 - Compliance Monitoring Program Manager
 - Compliance Monitoring Field Coordinator
 - Supervisors or managers of ECY, WDFW and other field staff
 - ECY, WDFW, and tribal field representatives

Recording Necessary Field Review Data

- Documentation for field assessments will consist of:
 - Field notes templates (Appendix D) or notes from field books. These are the documentation to support answers on the field form.
 - Field forms. These are composed of a series of questions derived from Washington Administrative Code (WAC) language related to specific rules that govern the prescriptions under review.
 - Answers to questions on the field forms are based on field notes.
 - The forms detail compliance results for the individual rules within a prescription. Compliance with the FPA is also evaluated, when relevant.
 - Field forms should also be used to record notes if there is disagreement, or if additional information is needed to determine compliance. If additional information is needed, potential outcomes dependent on acquisition of such materials should be denoted in comment areas.

Field Sample Selection

- In most cases, segments are randomly selected by CMP staff prior to the field visit. However, some information is provided here for situations in which pre-selected segments need to be dropped or changed during the site visit due to on-the-ground conditions that were not apparent during office review.

- Safety overrides all other considerations when measuring an RMZ, WMZ, ELZ, road, or haul route. If proper measurements cannot be completed safely, and a determination of compliance cannot be made, the segment should be dropped and another selected. Also, when weather conditions are unsafe for fieldwork (high wind, etc.) the team will discontinue work until it is safe to resume work. Everyone has Stop Work Authority for unsafe conditions.
- Only one of each different prescription type will be reviewed on each FPA. For example, if an FPA has two DFC1 harvests, only one will be chosen at random.
 - The CMP typically uses a spreadsheet that generates random numbers to determine which segment to review. If the spreadsheet results are not available, any random, unbiased selection method may be used.
 - Both sides of a double-sided Type S or F RMZ will be reviewed, unless one or both sides are treated as separate DFC segments by the applicant. Both sides of an Np RMZ or ELZ, or an Ns ELZ will be reviewed, as long as both sides were harvested under the FPA selected for review.
- Landowner segment identifiers are used when provided on the FPA. For stream segments or water bodies without designators, such as non-numbered Np or Ns streams, DNR CMP staff will assign identifiers to the segments. Identifiers will begin in the upper-left-hand side of the FPA and proceed as if reading lines of text. After all segments have been identified, the random number generator spreadsheet will be used to determine the segment chosen. DNR CMP staff will ensure that participants know what segment has been chosen by posting segment selections on the SharePoint site.
- In the event a segment is dropped, review the next randomly chosen segment on the selected FPA. If none are available, select from a new FPA. A segment should be dropped if it is wholly or partially off the applicant's property in such a way that it affects the team's ability to review the resource (except for instances when either all or part of the RMZ lies within a public road Right-of-Way), it is unsafe to review, or the prescriptions listed are not complete or non-existent (i.e., if the FPA was mis-screened or no stream channels exist in the vicinity of a stream marked on the FPA map that was selected for review).
- In general, the entire length of the selected segment must be surveyed. This may include several branches of an Np stream system.

Compliance Determinations

This section summarizes the determinations that the DNR lead makes and records during field reviews, and categories of information that the CMP will biennially report to the Forest Practices Board.

The CMP utilizes average compliance for a prescription among FPAs rather than the proportion of completely compliant FPAs. Each FPA is viewed as a cluster of rule applications, and they will be grouped according to riparian prescription or road activity. Single rules within each prescription or activity will be a simple binomial proportion; the rule is either compliant or a deviation.

Thus, a prescription form may have nine total rules, of which the reviewed segment has seven

applicable rules, and six of those rules are implemented properly. In this scenario, the average compliance for that prescription is 86 percent (six compliant rules / seven total applicable rules = 86 percent).

Most form questions are assessed for both FPA compliance and Rule compliance, except for site characteristics (such as site class, water type, dominant tree species), which are only assessed for rule compliance. A separate determination of compliance will be made for the applicant's FPA documentation (FPA compliance) as well as compliance with rule requirements (Rule compliance). A determination of deviation from compliance for a site characteristic may result in the remainder of the rule questions becoming not applicable, but FPA compliance will still be assessed for any remaining applicable questions based on the FPA information. For example, a resource may have been identified as a Type A wetland on the FPA, and compliance monitoring review finds that the resource is a Type F water. In this situation, the water type would be not compliant, all the remaining rule questions would be not applicable, and the resource would then be assessed for FPA compliance as if it were a Type A wetland as identified on the FPA.

The opposite may occur as well; an applicant may be compliant with the rules, but not compliant with the terms of their application. For example, a landowner may designate an entire Np stream as no-harvest on their FPA in exceedance of the rules, but if harvest did occur on part of the stream where it was allowed by rule, the relevant question would be compliant for the rule and not compliant with the FPA documentation.

It is understood that Forest Practices Foresters have limited time and must often prioritize portions of an FPA to review before approval. For Forest Practices Foresters, it is often impractical to look at all aspects of a particular FPA, especially when many FPAs require attention simultaneously. FPA or rule compliance determinations by the CMP are not intended to reflect on or be an audit of DNR regulatory staff. Compliance Monitoring data collection is based on a statewide study design. No inferential statistical analysis or conclusions can be made for population subsets (i.e., DNR Regions, individual Forest Practice Foresters, individual landowners, etc.). Attempts to interpret data in this manner are to be avoided.

A compliance determination will be made for each individual rule that makes up a prescription or activity. If a rule is determined to be **compliant**, it meets the minimum protection standard identified in the rule (for rule compliance) or adheres to the terms of the approved FPA (for FPA compliance).

The **deviation from compliance** determination means that an individual rule was not properly implemented and did not meet protection standards. As with the compliance determination, this will be made on each individual rule that makes up a prescription or activity. If an activity is determined to have deviated from rule, it either did not meet the protection standard identified in the rule (for rule deviations) or did not follow the terms of the FPA (for FPA deviations).

Common examples are:

- Outer Zone leave tree count not met
- RMZs were harvested where no harvest was allowed or where no harvest was designated per the FPA information

- Water crossing structure is inadequate (e.g., under-sized) for stream protection standards

Reasons for Deviation

The deviation reason assessment is a determination made by the field team as to a potential cause of deviation. It is important to note that these deviation reasons entail professional judgment. There are three deviation categories — Layout, Operational, and Administrative. It is acceptable for more than one category to be chosen for each instance of compliance deviation. The following guidelines are used to assist professional judgment when deducing the cause of deviation in the field:

- **Layout** — The arrangement of the harvest unit did not meet the specifications of the rule. Examples include:
 - A stream meander is unaccounted for in the layout of an RMZ; boundary markings are too close to the stream BFW to meet required buffer width.
 - A road cross drain is located or oriented in such a way as to cause sediment delivery to a typed water.
- **Operational** — The timber harvest and related activities process did not follow the correctly marked layout of the harvest unit or associated activity. Examples include:
 - Designated leave trees harvested within a no-cut Inner Zone.
 - A necessary relief culvert listed on the FPA or road plan was not installed during road construction.
- **Administrative** — Information or data provided on the Forest Practices Application and associated documents deviates from the conditions observed on the ground. In some cases, the resource may have been properly protected despite the incorrect information on the FPA. Examples include:
 - An incorrect site class is recorded on an FPA.
 - Incomplete shade documentation.
 - Incorrect overstory species entered into Desired Future Condition program.

Deviation Severity Ratings

As indicated in the introductory portion of this section, a “deviation from compliance” determination is reported in absolute terms, but qualitative information derived from professional judgment in the field is also reported to the Forest Practices Board. After considering several ways to structure a system of reporting “deviation from compliance” determinations DNR, with input from WDFW, developed the following categories for field personnel to use professional judgment in reporting their findings. These ratings will be applied to each rule within a prescription that is found to deviate from requirements excluding site characteristic rules (i.e., water type, site class, and dominant overstory tree species). The following ratings include examples of degrees of impact to aid in rating deviations from compliance, and reference tables are included in Appendix D. Final decisions on deviation rating lie with the DNR lead who will use input from field participants and professional judgment, taking into consideration site-specific factors, to make their determination.

Deviation from Compliance - Low – Minor deviation from requirements of rule. This is generally used when the impact of the rule deviation is likely to be insignificant or small over the short- to medium-term (e.g., 1-2 improperly harvested trees in the Core Zone, up to 5 improperly harvested trees in the Inner/Outer Zones, or up to 10 yards of sediment delivery).

Deviation from Compliance - Moderate – Moderate deviation from requirements of rule. This is generally used when the impact of the rule deviation is likely to be moderate over the short- to medium-term (e.g., 3-7 improperly harvested trees in the Core Zone, 6-10 improperly harvested trees in the Inner/Outer Zones, or up to 11-20 yards of sediment delivery).

Deviation from Compliance - High – Major deviation from requirements of rule. This is generally used when the impact of the rule deviation is likely to be high over the short-term (e.g., over 7 improperly harvested trees in the Core Zone, over 10 improperly harvested trees in the Inner/Outer Zones, or over 20 yards of sediment delivery).

It is important to note that these professional judgment deviation ratings should not be used to excuse activities that violate the rules or approved FPAs. This process helps to add perspective in evaluating the environmental risk associated with the deviation statistics.

Implementing this system requires the following assumptions:

- All participants realize that this process relies on professional judgment and acknowledge that this process is not meant to represent any effectiveness determination.
- This is an educated assessment of the level of the deviation as it relates to the resource, not a surrogate for effectiveness monitoring.

Fish-Bearing Waters

There are a variety of management options available for harvest adjacent to Type S or F water. The three options assessed by CMP are:

- No Inner Zone Harvest (NIZH)
- Desired Future Condition 1 (DFC1)
- Desired Future Condition 2 (DFC2)

These prescription types use RMZs consisting of a 50-foot no-cut Core Zone, an Inner Zone, and an Outer Zone. A 50-foot Core Zone is standard on all three prescription types, while Inner and Outer Zone widths can vary based on average stream width, site class, and selected harvest strategy (Figures 1, 2, 4, and 7).



Figure 1: Type F and S water RMZ Layout

The following sections on NIZH, DFC1, and DFC2 (pages 12-27) outline the field data collection procedures for each of these prescriptions.

No Inner Zone Harvest (NIZH)

Note: Some rule requirements differ for NIZH between western and eastern WA. Use the correct form for your location. These instructions have separate Westside and Eastside Outer Zone procedures.

The field team will work to determine compliance regarding the seven rules for this prescription listed on the field form. Questions #2 (Site Class not underrepresented) and #6 (shade documentation) are administrative checks performed in advance of the field visit. Question #6 is never applicable for eastern WA NIZH because of the core plus inner zone minimum widths.

NIZH RMZ buffer widths depend on average stream size, site class, and location (Eastern or Western WA) (Figure 2). The team will move as a unit, establishing either 50- or 100-foot stations (Appendix A) as they go. They will check for cut stumps within the Core Zone and Inner Zone and tally all Outer Zone leave trees (OZLT) that meet diameter requirements.

Personnel Layout:

- At BFW/Edge of CMZ-
 - ***1-2 Participants***
 - Responsible for setting up stations with string box and flagging, determining actual stream width using BFW measurements (Appendix A), ensuring the Inner/Outer Zone personnel are perpendicular to the stream direction, and visibly placing the retractable reflector at the edge of the nearest side of BFW/CMZ to help personnel at other positions to lay out the Inner and Outer Zone stations.
- At 50-foot Core Zone Outer Edge-
 - ***1 Participant (OPTIONAL)***
 - Responsible for flagging the 50-foot Core Zone at each appropriate station, looking for cut stumps within the Core and Inner Zones, and helping personnel on the Inner/Outer Zone line establish the appropriate buffer distance and angle to the stream. This position is optional, as there should be no harvest within the Inner Zone. If topography is steep, the zone has low visibility due to brush, or the stream is loud, this position could be necessary for communication purposes.
- At Inner/Outer Zone Edge-
 - ***2 Participants***
 - **Person 1-** Responsible for flagging Inner/Outer Zone edge, helping personnel at the outer edge of the Outer Zone establish their distance and position, and taking horizontal distance measurements between stations (parallel to stream) with Person 2 to calculate actual RMZ length. Checks for stumps within the Inner Zone.
 - **Person 2-** Remains one station behind to take horizontal distance shots up to Person 1 with the laser rangefinder. Assists with looking for stumps within the Inner Zone and counting Outer Zone leave trees.
- Outer edge of Outer Zone-
 - ***1 Participant***

- Responsible for flagging the outer edge of the Outer Zone at the appropriate distance and angle to the stream. If no additional staff are present, this person is also responsible for counting the Outer Zone leave trees (potentially with help from one of the personnel at the Outer/Inner Zone edge) and recording all field data for the team. It may not always be necessary to measure and flag the outer edge of the Outer Zone if all leave trees are clearly inside the zone width.

Core and Inner Zones:

- Between every two stations, determine if trees were harvested within the no-harvest buffer. Between appropriate stations, record in the field notes:
 - Number of trees cut. If too many trees to reasonably count were harvested within the no-harvest area, record approximate number.
 - Approximate stump diameter, when appropriate.
 - Measured or estimated distance of each stump from BFW. This includes trees cut within the 5 percent measurement error tolerance.
 - If there are questions about distance, measure from BFW directly to the center of the stump. This extra measuring will help compensate for sinuosity, bank erosion, etc. along the continuous RMZ width.
 - For line trees, count every other tree as in, just as in standard property line compensation for line trees.
- Trees cut consistently within the 5 percent measurement error tolerance (refer to “Error Tolerance” section below) would result in a deviation from compliance. “Consistently” means over 50 percent of the trees within the 5 percent band were removed.
- Compliance or deviation from compliance will be based on rule requirements. Deviation ratings will be based on professional judgment, taking into consideration site-specific conditions on the ground.

Outer Zone:

Outer Zone leave tree requirements vary by location (westside vs. eastside) and are detailed below.

Western Washington

- 20 leave trees per acre are required in the Outer Zone. One Outer Zone leave tree strategy must be selected: either dispersal or clumping. A third option of LWD placement is available to landowners who voluntarily implement such a plan. CMZ exchanges may also be allowed on a basal area-for-basal area basis. Refer to relevant bullets below for more detail on each strategy.
- **Standard OZLT Strategies:**
 - Determine from the FPA (Question 25, RMZ harvest codes) if leave trees are dispersed or clumped. Trees must be conifer species to count toward the leave tree tally, except for within sensitive features when the clumping strategy is selected. Hardwoods and conifers less than 12 inches DBH must be clumped on a sensitive feature as defined in WAC 222-30-021(1)(c)(ii) and must be representative of overstory canopy species in or around the sensitive feature to count as leave trees.

- Tally between stations the Outer Zone conifer leave trees 12 inches DBH or larger if no sensitive features are present. If sensitive features are present and the clumping OZLT strategy was selected, tally hardwoods and conifers 8 inches DBH or larger when clumped on said sensitive feature(s).
 - If blowdown 12.0 inches DBH (or 8.0 inches DBH for clumping on sensitive features) or larger is reasonably expected to have fallen since the FPA was approved, include in tally. Trees cut for safety reasons and left on site should also be counted if they meet diameter requirements. Ensure stump/root ball is in the Outer Zone.
 - After completion of measurements, calculate acreage of Outer Zone and determine required number of Outer Zone leave trees.
- **CMZ Exchanges:**
 - Tally 100 percent of the CMZ trees; conifer tally trees must be at least 6 inches DBH and hardwood tally trees must be at least 10 inches DBH.
 - Conifer in the CMZ at least 6 inches DBH will offset conifer in the Outer Zone at a 1:1 ratio.
 - Hardwood in the CMZ at least 10 inches DBH will offset hardwood in the Outer Zone at a 1:1 ratio.
 - Hardwood in the CMZ at least 10 inches DBH will offset conifer in the Outer Zone at a 3:1 ratio.
 - The CMZ exchanges above are by basal area (BA), not stem count.
- **LWD Placement Strategy Exchanges:**
 - Outer Zone leave trees may be reduced by up to 50 percent with a large woody debris (LWD) placement strategy. Strategy must be included in FPA documentation, and Outer Zone leave trees may not be reduced to less than 10 TPA.

Eastern Washington

- Verify the habitat type. This determines Outer Zone leave tree requirements.
 - Ponderosa pine habitat type – Leave 10 dominant or co-dominant trees per acre (TPA).
 - Mixed conifer habitat type – Leave 15 dominant or co-dominant TPA.
 - High elevation habitat type – Follow stand requirements for Western WA RMZs.
- Tally 100 percent of the dominant and co-dominant Outer Zone trees and add up the total numbers to compare with required leave trees.
- After completion of measurements, calculate acreage of Outer Zone and determine required number of Outer Zone leave trees.
- **LWD Placement Strategy Exchanges:**
 - Outer Zone leave trees may be reduced by up to 50 percent with a large woody debris (LWD) placement strategy. Strategy must be included in FPA documentation, and Outer Zone leave trees may not be reduced to less than 50 percent of the required leave trees by habitat type.

Error Tolerance:

A 5 percent measurement error tolerance will apply to all zone widths within the RMZ. Stumps within the 5 percent error tolerance (measured from the center of the stump) will be considered compliant. Outer or Inner Zone leave trees that fall within the 5 percent error tolerance may count toward either zone, however they cannot count toward both zones (i.e., these trees may count as an Inner *or* Outer Zone leave tree, not an Inner *and* Outer Zone leave tree). The 5 percent error tolerance does not apply to **number** of stumps cut within a no-harvest zone, but only to measured distance of buffer widths/lengths.

4a No Inner Zone Harvest



WESTERN WASHINGTON

SF TYPE 'S' OR 'F' WESTERN WASHINGTON RMZ REQUIREMENTS



TYPES 'S' AND 'F' ARE FISH HABITAT STREAMS

Site Class	Total RMZ Width	Core Zone Width ¹	Inner Zone Width ²		Outer Zone Width ³	
			Stream ≤ 10'	Stream > 10'	Stream ≤ 10'	Stream > 10'
I	200'	50'	83'	100'	67'	50'
II	170'	50'	63'	78'	57'	42'
III	140'	50'	43'	55'	47'	35'
IV	110'	50'	23'	33'	37'	27'
V	90'	50'	10'	18'	30'	22'

No Harvest



EASTERN WASHINGTON

SF TYPE 'S' OR 'F' EASTERN WASHINGTON RMZ REQUIREMENTS



TYPES 'S' AND 'F' ARE FISH HABITAT STREAMS

Bankfull width less than or equal to 15 feet

Site Class	Total RMZ Width	Core Zone Width ¹	Inner Zone Width ²	Outer Zone Width ³
I	130'	30'	45'	55'
II	110'	30'	45'	35'
III	90'	30'	45'	15'
IV	75'	30'	45'	0'
V	75'	30'	45'	0'

No Harvest

¹ Measured from outer edge of bankfull width (BFW) or outer edge of Channel Migration Zone (CMZ), whichever is greater.

² Measured from outer edge of Core Zone.

³ Measured from outer edge of Inner Zone.

Bankfull width greater than 15 feet

Site Class	Total RMZ Width	Core Zone Width ¹	Inner Zone Width ²	Outer Zone Width ³
I	130'	30'	70'	30'
II	110'	30'	70'	10'
III	100'	30'	70'	0'
IV	100'	30'	70'	0'
V	100'	30'	70'	0'

No Harvest

Figure 2: NIZH RMZ Requirements

DFC1 (Thinning from Below)

Note: Inner Zone harvest strategies (DFC1 and DFC2) are evaluated in Western WA only by current Compliance Monitoring standard sample.

The field team will work to determine compliance regarding the nine rules for this prescription listed on the field form. Questions #2 (Site Class not underrepresented), and #7 (shade documentation) are administrative checks performed in advance of the field visit.

DFC1 RMZ buffer widths depend on average stream size and site class (Figure 4). Both will be referenced in the FPA and listed on the DFC summary sheet attached to the FPA. The DFC printout will include runs for both DFC1 and DFC2 for each segment, so ensure that the pages specifically for DFC1 and for the correct segment are used for the review. Zone widths will be outlined on the DFC worksheet for the selected segment (refer to Figure 6).

The team will move as a unit, establishing either 50- or 100-foot stations (Appendix A) as they go. They will check for cut stumps within the Core Zone, measure the diameter of leave trees within the Inner Zone, and tally all Outer Zone leave trees (OZLT) that meet diameter requirements. The team will also assess if the dominant tree species is consistent with the species listed on the DFC worksheet.

Personnel Layout:

- At BFW/Edge of CMZ-
 - **1-2 Participants**
 - Responsible for setting up stations with string box and flagging, determining actual stream width using BFW measurements (Appendix A), ensuring the Inner/Outer Zone personnel are perpendicular to the stream direction, and visibly placing the retractable reflector at the edge of the nearest side of BFW/CMZ to help personnel at other positions to lay out the Inner and Outer Zone stations.
- At 50-foot Core Zone Outer Edge-
 - **1 Participant**
 - Responsible for flagging the 50-foot Core Zone at each appropriate station, looking for cut stumps within the Core Zone, and helping personnel on the Inner/Outer Zone line establish the appropriate buffer distance and angle to the stream.
- At Inner/Outer Zone Edge-
 - **2 Participants**
 - **Person 1-** Responsible for flagging Inner/Outer Zone edge, helping personnel at the outer edge of the Outer Zone establish their distance and position, and taking horizontal distance measurements between stations (parallel to stream) with Person 2 to calculate actual RMZ length.
 - **Person 2-** Remains one station behind to take horizontal distance shots up to Person 2 with the laser rangefinder. Assists with measuring trees in Inner Zone and tallying trees in Outer Zone.
- Outer edge of Outer Zone-

- **1 Participant**
 - Responsible for flagging the outer edge of the Outer Zone at the appropriate distance and angle to the stream. If no additional staff are present, this person is also responsible for counting the Outer Zone leave trees (potentially with help from one of the personnel at the Outer/Inner Zone edge) and recording all field data for the team. It may not always be necessary to measure and flag the outer edge of the Outer Zone if all leave trees are clearly inside the zone width.
- Additional Personnel
 - Any additional personnel can assist with measuring DBH of Inner Zone trees, tallying Outer Zone trees, or scribing field data.

Core Zone:

- Between every two stations, determine if trees were harvested within the no-harvest buffer. Between appropriate stations, record in the field notes:
 - Number of trees cut. If too many trees to reasonably count were harvested within the no-harvest area, record approximate number.
 - Approximate stump diameter, when appropriate.
 - Measured or estimated distance from BFW. This includes trees cut within the 5 percent measurement error tolerance.
 - If there are questions about distance, measure from BFW directly to the center of the stump. This extra measuring will help compensate for sinuosity, bank erosion, etc. along the continuous RMZ width.
 - For line trees, count every other tree as in, just as in standard property line compensation for line trees.
- Trees cut consistently within the 5 percent measurement error tolerance (refer to “Error Tolerance” section below) would result in a deviation from compliance. “Consistently” means over 50 percent of the trees within the 5 percent band were removed.
- Compliance or deviation from compliance will be based on rule requirements. Deviation ratings will be based on professional judgment, taking into consideration site-specific conditions on the ground.

Inner Zone Tree Counting:

- Tally Inner Zone trees by 2-inch diameter classes (Figure 3) at breast height (DBH) starting one size class below the smallest size class of required leave trees (refer to the selected FPA’s DFC printout for the required leave tree size classes), and then continue DBH measurements for all subsequent required leave trees. Starting tree tally measurements with the size class below the smallest required DBH size class helps in the event of a discrepancy between reported and observed stream length, stream size, or dominant tree species, requiring that a DFC calculation be re-run with the corrected input to determine compliance with rules.
- Include blowdown and snags reasonably expected to have been standing at time of harvest in the tally. Trees cut for safety reasons and left on site should also be counted if they fall within the diameter classes of required leave trees.
- Excess larger diameter class trees may be used to substitute for insufficient smaller diameter class leave trees.

- Tree diameters are measured with a diameter tape in units of tenths of inches.
- Core Zone trees are not to be measured or tallied.
- While cruising the Inner Zone, also check for stumps that appear larger than the thinning strategy allowed.
 - CMP cannot determine exactly what the DBH would have been from a stump. However, using professional judgment, the team can reasonably estimate if the tree stump was obviously larger than the thinning strategy allowed.
- For line trees, count every other tree as in, just as in standard property line compensation for line trees.

Outer Zone:

- 20 leave trees per acre are required in the Outer Zone. One Outer Zone leave tree strategy must be selected: either dispersal or clumping. A third option of LWD placement is available to landowners who voluntarily implement such a plan. CMZ exchanges may also be allowed on a basal area-for-basal area basis. Refer to relevant bullets below for more detail on each strategy.
- **Standard OZLT Strategies:**
 - Determine from the FPA (Question 25, RMZ harvest codes) if leave trees are dispersed or clumped. Trees must be conifer species to count toward the leave tree tally, except for within sensitive features when the clumping strategy is selected. Hardwoods and conifers less than 12 inches DBH must be clumped on a sensitive feature as defined in WAC 222-30-021(1)(c)(ii) and be representative of overstory canopy species in or around the sensitive feature to count as leave trees.
 - Tally between stations the Outer Zone conifer leave trees 12 inches DBH or larger if no sensitive features are present. If sensitive features are present and the clumping OZLT strategy was selected, tally hardwoods and conifers 8 inches DBH or larger when clumped on said sensitive feature(s).
 - Include blowdown and snags reasonably expected to have been standing at time of harvest in the tally. Trees cut for safety reasons and left on site should also be counted if they fall within the diameter classes of required leave trees. Check location of stump/root ball to ensure it is tallied into the correct zone when counting downed trees.
- After completion of measurements, calculate acreage of Outer Zone, and determine required number of Outer Zone leave trees.
- **CMZ Exchanges:**
 - Tally 100 percent of the CMZ trees; conifer tally trees must be at least 6 inches DBH and hardwood tally trees must be at least 10 inches DBH.
 - Conifer in the CMZ at least 6 inches DBH will offset conifer in the Outer Zone at a 1:1 ratio.
 - Hardwood in the CMZ at least 10 inches DBH will offset hardwood in the Outer Zone at a 1:1 ratio.
 - Hardwood in the CMZ at least 10 inches DBH will offset conifer in the Outer Zone at a 3:1 ratio.
 - The CMZ exchanges above are by basal area (BA), not stem count.
- **LWD Placement Strategy Exchanges:**

- Outer Zone leave trees may be reduced by up to 50 percent with a large woody debris (LWD) placement strategy. Strategy must be included in FPA documentation, and Outer Zone leave trees may not be reduced to less than 10 TPA.

A dot grid system is recommended for use in field notes for any prescriptions which require trees of various size classes or in different upland zones to be tallied. Refer to the “References” section of Appendix D for an example of the dot grid system.

Error Tolerance:

A 5 percent measurement error tolerance will apply to all zone widths within the RMZ. Stumps within the 5 percent error tolerance (measured from the center of the stump) will be considered compliant. Outer or Inner Zone leave trees that fall within the 5 percent error tolerance may count toward either zone, however they cannot count toward both zones (i.e., these trees may count as an Inner *or* Outer Zone leave tree, not an Inner *and* Outer Zone leave tree). The 5 percent error tolerance does not apply to **number** of stumps cut within a no-harvest zone, but only to measured distance of buffer widths/lengths.

<i>Two-Inch Diameter Classes</i>										
<i>Class</i>	<i>12”</i>	<i>14”</i>	<i>16”</i>	<i>18”</i>	<i>20”</i>	<i>22”</i>	<i>24”</i>	<i>26”</i>	<i>28”</i>	<i>30”</i>
<i>Range</i>	<i>11.0-12.9</i>	<i>13.0-14.9</i>	<i>15.0-16.9</i>	<i>17.0-18.9</i>	<i>19.0-20.9</i>	<i>21.0-22.9</i>	<i>23.0-24.9</i>	<i>25.0-26.9</i>	<i>27.0-28.9</i>	<i>29.0-30.9</i>

Figure 3: Two-Inch Diameter Class Ranges

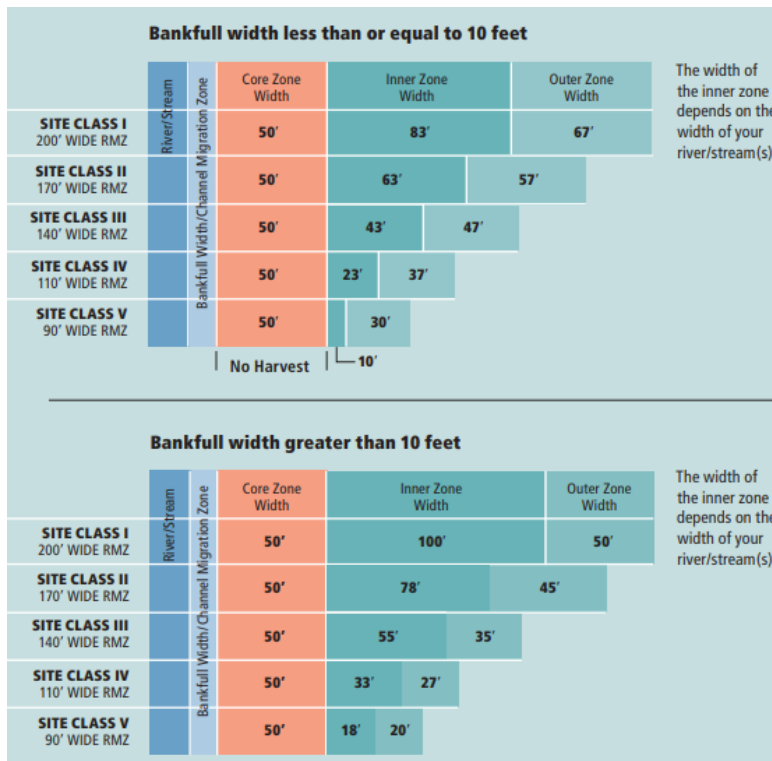


Figure 4: DFC1 Buffer Widths

LEAVE TREE REQUIREMENTS
Option 1 | Thinning from Below Canopy

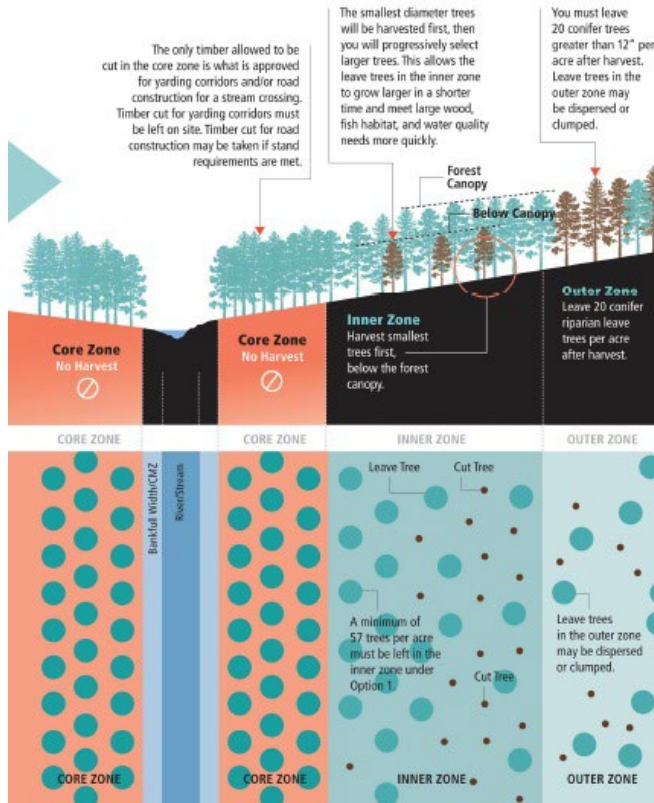


Figure 5: DFC1 RMZ Harvest Strategy

Inner Zone post-thinning Statistics

Trees / Acre: 58.73
 Basal Area / Acre: 85.72
 Percent Conifer: 100
 Required Basal Area of Thinned Inner Zone at age 140 must be at least 248.28 Sq. Ft / Acre at age 140.
 Projected Basal Area of Thinned Inner Zone at age 140 will be at least 267.45 Sq. Ft / Acre at age 140.

The inner zone for Option 1 is from 50 to 93 feet.

Inner Zone Stand Table

DBH	Conifers: Can Be Cut	Required Leave Trees	Hardwood: Can Cut All	Required Leave Trees	Conifer BA Cut	Conifer BA Leave
6	16	0	0	0	3.14	0
8	13	0	0	0	4.54	0
10	17	0	0	0	9.27	0
12	41	0	0	0	32.2	0
14	24	3	0	0	25.66	3.21
16	0	22	0	0	0	30.72
18	0	6	0	0	0	10.6
20	0	1	0	0	0	2.18
				Totals	74.81	46.71

Option 1 Outer Zone Width: 47
 Option 1 Outer Zone Acres: 0.6

Figure 6: DFC Worksheet Example

DFC2 (Leaving Trees Closest to the Water)

Note: DFC2 is not permitted for Eastern WA due to the minimum floor (100 feet) constraint.

The field team will work to determine compliance regarding the eight rules for this prescription listed on the field form. Question #2 (Site Class not underrepresented) is an administrative check performed in advance of the field visit.

DFC2 RMZ buffer widths depend on average stream size and site class and DFC2 is not always allowed as an option for some streams due to width and site class combinations (Figure 7). Both will be referenced in the FPA and listed on the DFC summary sheet attached to the FPA. The DFC printout will include runs for both DFC1 and DFC2 for each segment, so ensure that the page(s) specifically for DFC2 and for the correct segment are used for the review. Zone widths will be outlined on the DFC worksheet for the selected segment (Figure 9). Inner Zones in the DFC2 prescription are split into a no-cut extension (Inner Zone floor) closer to the stream (adjacent to the Core Zone) and a partially harvestable Inner Zone strip between the no-cut extension and the Outer Zone.

The team will move as a unit, establishing either 50- or 100-foot stations (Appendix A) as they go. They will check for cut stumps within the Core Zone and no-cut Inner Zone floor, measure the diameter of leave trees within the harvestable portion of the Inner Zone, and tally all Outer Zone leave trees (OZLT) that meet diameter requirements. The team will also assess if the dominant tree species is consistent with the species listed on the DFC worksheet.

Personnel Layout:

- At BFW/Edge of CMZ-
 - ***1-2 Participants***
 - Responsible for setting up stations with string box and flagging, determining actual stream width using BFW measurements (Appendix A), ensuring the Inner/Outer Zone personnel are perpendicular to the stream direction, and visibly placing the retractable reflector at the edge of the nearest side of BFW/CMZ to help personnel at other positions to lay out the Inner and Outer Zone stations.
- At 50-foot Core Zone Outer Edge-
 - ***1 Participant (OPTIONAL)***
 - Responsible for flagging the 50-foot Core Zone at each appropriate station, looking for cut stumps within the Core and Inner Zones, and helping personnel on the Inner/Outer Zone line establish the appropriate buffer distance and angle to the stream. This position is optional, as there should be no harvest within the no-cut Inner Zone extension. If topography is steep, the zone has low visibility due to brush, or the stream is loud, this position could be necessary for communication purposes.
- At Outer Edge of No-Cut Inner Zone-
 - ***1 Participant***
 - Responsible for flagging the edge of the no-cut zone at each appropriate station, looking for cut stumps within the no-cut zone, and helping

personnel on the Inner/Outer Zone line establish the appropriate buffer distance and angle to the stream.

- At Inner/Outer Zone Edge-
 - **2 Participants**
 - **Person 1-** Responsible for flagging Inner/Outer Zone edge, helping personnel at the outer edge of the Outer Zone establish their distance and position, and taking horizontal distance measurements between stations (parallel to stream) with Person 2 to calculate actual RMZ length.
 - **Person 2-** Remains one station behind to take horizontal distance shots up to Person 1 with the laser rangefinder. Assists with measuring trees in the outer managed portion of the Inner Zone and tallying trees in the Outer Zone.
- Outer edge of Outer Zone-
 - **1 Participant**
 - Responsible for flagging the outer edge of the Outer Zone at the appropriate distance and angle to the stream. If no additional staff are present, this person is also responsible for counting the Outer Zone leave trees (potentially with help from one of the personnel at the Outer/Inner Zone edge) and recording all field data for the team. It may not always be necessary to measure and flag the outer edge of the Outer Zone if all leave trees are clearly inside the zone width.
- Additional Personnel
 - Any additional personnel can assist with measuring DBH of Inner Zone trees, tallying Outer Zone trees, or scribing field data.

Core/No-Cut Inner Zone:

- Between every two stations, determine if trees were harvested within the no-harvest buffer. Between appropriate stations, record in the field notes:
 - Number of trees cut. If too many trees to reasonably count were harvested within the no-harvest area, record approximate number. Differentiate between harvest that occurred in the Core Zone versus the no-cut Inner Zone.
 - Approximate stump diameter, when appropriate.
 - Measured or estimated distance from BFW. This includes trees cut within the 5 percent measurement error tolerance.
 - If there are questions about distance, measure from BFW directly to the center of the stump. This extra measuring will help compensate for sinuosity, bank erosion, etc. along the continuous RMZ width.
 - For line trees, count every other tree as in, just as in standard property line compensation for line trees.
- Trees cut consistently within the 5 percent measurement error tolerance (refer to “Error Tolerance” section below) would result in a deviation from compliance. “Consistently” means over 50 percent of the trees within the 5 percent band were removed.
- Compliance or deviation from compliance will be based on rule requirements. Deviation ratings will be based on professional judgment, taking into consideration site-specific conditions on the ground.

Outer Portion of Inner Zone:

- Tally any stumps in the “floor zone,” the no-harvest portion of the Inner Zone.
- Tally required leave trees in the outer portion of the Inner Zone.
 - Leave trees must be conifer measuring 12 inches DBH or larger. This means a tree that falls into the 12-inch diameter *class* (11.0-12.9 inches) measuring 11.0” to 11.9” would not count as a leave tree for the DFC2 prescription.
 - Include blowdown and snags reasonably expected to have been standing at time of harvest in the tally. Trees cut for safety reasons and left on site should also be counted if they fall within the diameter classes of required leave trees. Check location of stump/root ball to ensure it is tallied into the correct zone when counting downed trees.
 - Excess larger diameter class trees may be used to substitute for insufficient smaller diameter class leave trees.
 - Tree diameters are measured with a diameter tape in units of tenths of inches.
 - DFC2 is not allowed when average BFW exceeds 10 feet on Site Class III ground. When these conditions are encountered, the field team is to determine compliance for any relevant rule questions and may still conduct FPA compliance for the DFC2 prescription.
- Stream-adjacent parallel roads and DFC2
 - A stream-adjacent parallel road may be an issue for a DFC2 harvest if the basal area components of the stand requirement cannot be met within the sum of the areas of the Inner and Core Zones.
 - An estimation must be made of the approximate basal area that would have been present in the Inner and Core Zones if the road was not present in the Core/Inner Zone.
 - Trees containing basal area equal to the amount determined above shall be left elsewhere in the Inner or Outer Zone or, if the zones contain insufficient riparian leave trees, substitute riparian leave trees will be left within the RMZ of other Type S or F Streams in the same unit. Refer to WAC 222-30-021(1)(b)(ii)(B)(II)(iii).
 - Refer to WAC 222-16-010 for the definition of stream-adjacent parallel roads.

Outer Zone:

- The total number of OZLT required for a segment is calculated by the DFC program based on the input (Figure 9). One Outer Zone leave tree strategy must be selected: either dispersal or clumping. A third option of LWD placement is available to landowners who voluntarily implement such a plan. CMZ exchanges may also be allowed on a basal area-for-basal area basis. Refer to relevant bullets below for more detail on each strategy.
- **Standard OZLT Strategies:**
 - Determine from the FPA (Question 25, RMZ harvest codes) if leave trees are dispersed or clumped. Trees must be conifer species to count toward the leave tree tally, except for within sensitive features when the clumping strategy is selected. Hardwoods and conifers less than 12 inches DBH must be clumped on a sensitive feature as defined in WAC 222-30-021(1)(c)(ii) and be representative of overstory canopy species in or around the sensitive feature to count as leave trees.

- Tally between stations the Outer Zone conifer leave trees 12 inches DBH or larger if no sensitive features are present. If sensitive features are present and the clumping OZLT strategy was selected, tally hardwoods and conifers 8 inches DBH or larger when clumped on said sensitive feature(s).
 - If blowdown 12.0 inches DBH (or 8.0 inches DBH for clumping on sensitive features) or larger is reasonably expected to have fallen since the FPA was approved, include in tally. Trees cut for safety reasons and left on site should also be counted if they meet diameter requirements. Ensure stump/root ball is in the Outer Zone for downed trees.
 - After completion of measurements, calculate acreage of Outer Zone, and determine required number of Outer Zone leave trees.
- Check for basal area exchanges associated with DFC2 prescriptions. These will be listed on the DFC2 attachment and appropriate RMZ codes must be included in the associated FPA tables.
- **CMZ Exchanges:**
 - Tally 100 percent of the CMZ trees; conifer tally trees must be at least 6 inches DBH and hardwood tally trees must be at least 10 inches DBH.
 - Conifer in the CMZ at least 6 inches DBH will offset conifer in the Outer Zone at a 1:1 ratio.
 - Hardwood in the CMZ at least 10 inches DBH will offset hardwood in the Outer Zone at a 1:1 ratio.
 - Hardwood in the CMZ at least 10 inches DBH will offset conifer in the Outer Zone at a 3:1 ratio.
 - The CMZ exchanges above are by basal area (BA), not stem count.
- **LWD Placement Strategy Exchanges:**
 - Outer Zone leave trees may be reduced by up to 50 percent with a large woody debris (LWD) placement strategy. Strategy must be included in FPA documentation, and Outer Zone leave trees may not be reduced to less than 10 TPA.

A dot grid system is recommended for use in field notes for any prescriptions which require trees of various size classes or in different upland zones to be tallied. Refer to the “References” section of Appendix D for an example of the dot grid system.

Error Tolerance:

A 5 percent measurement error tolerance will apply to all zone widths within the RMZ. Stumps within the 5 percent error tolerance (measured from the center of the stump) will be considered compliant. Outer or Inner Zone leave trees that fall within the 5 percent error tolerance may count toward either zone, however they cannot count toward both zones (i.e., these trees may count as an Inner *or* Outer Zone leave tree, not an Inner *and* Outer Zone leave tree). The 5 percent error tolerance does not apply to **number** of stumps cut within a no-harvest zone, but only to measured distance of buffer widths/lengths.

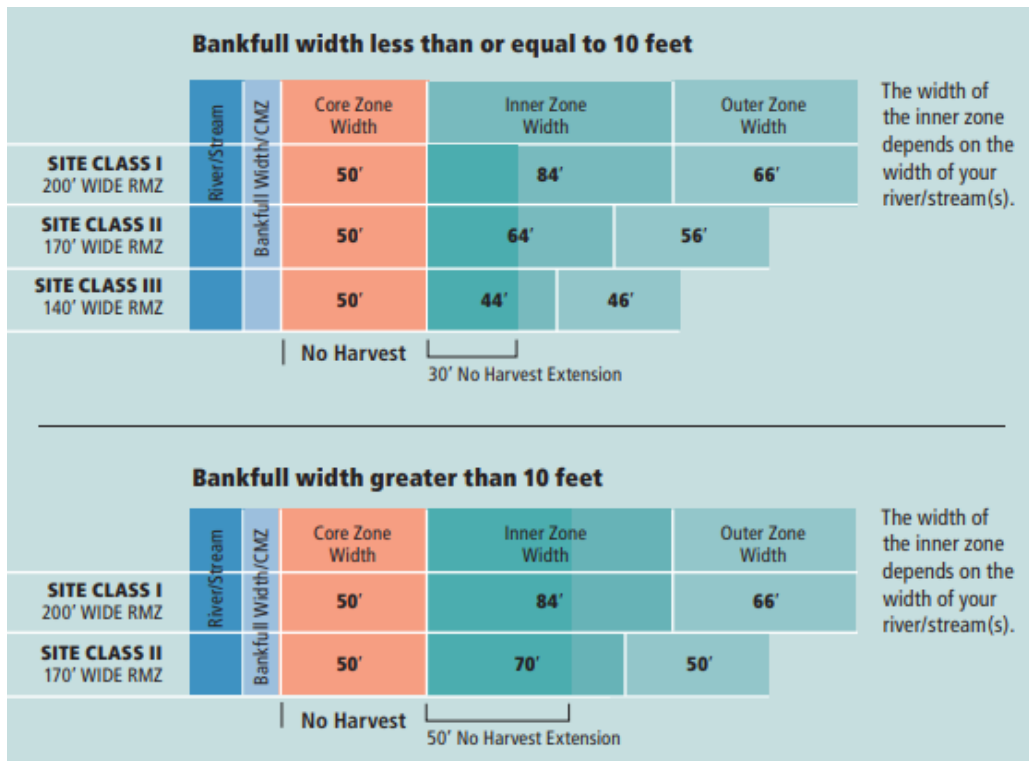


Figure 7: DFC2 Buffer Widths

LEAVE TREE REQUIREMENTS

WESTERN WASHINGTON

Option 2 | Leaving Trees Closest to Water

SF TYPE 'S' OR 'F' WESTERN WASHINGTON

TYPES 'S' AND 'F' ARE FISH HABITAT STREAMS

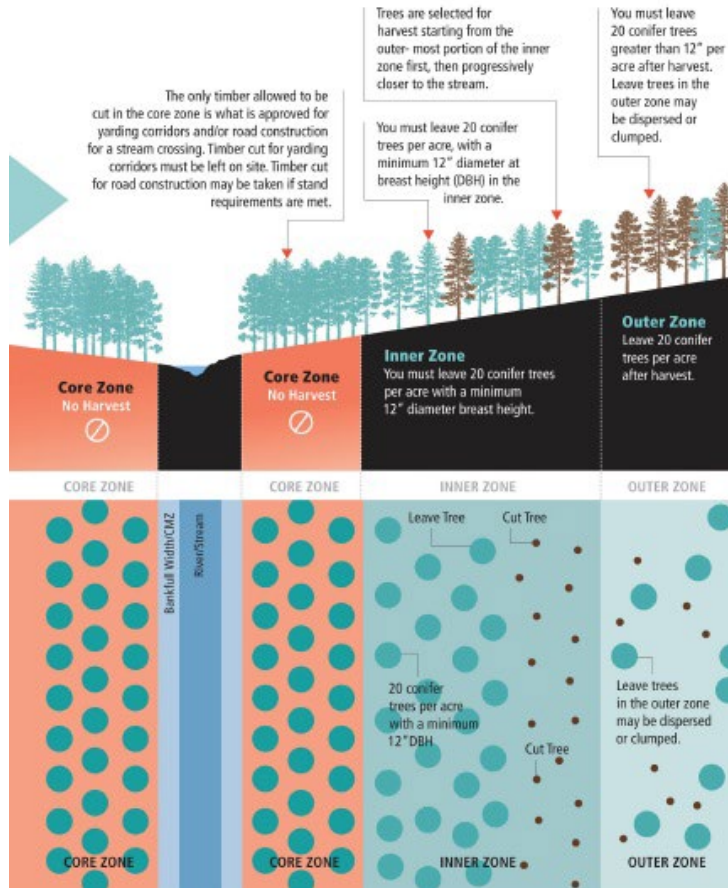


Figure 8: DFC2 RMZ Harvest Strategy

Inner Zone Floor: 50 to 81 feet, no harvesting allowed.

ClearCut Inner Zone : 81 to 94 feet, Need 7 Riparian leave trees in this area. Leave trees must be at least 12 inches at DBH.

Outer Zone: 94 to 140 feet, Need 24 Riparian leave trees in this area.

Option 2 Outer Zone Width: 46

Option 2 Outer Zone Acres: 1.16

Figure 9: DFC2 Worksheet Example

Non-Fish Perennial (Np) Streams

Note: Rules differ for Np streams between western and eastern WA. Be sure that you have the correct form for your location. These instructions are separated into Westside and Eastside procedures.

Np streams (Western WA)

The field team will work to determine compliance regarding the seven rules for this prescription listed on the field form. Np stream systems require either a no-harvest 50-foot buffer or a partial buffer depending on stream length and proximity to Type F or S streams (Figures 10-12).

The team will determine stream type, ELZ condition, and the location of uppermost point of perennial flow/perennial initiation point (UMPPF/PIP) if applicable, and then check buffer distances according to the selected strategy listed on the FPA. They will check for cut stumps within the no-cut buffer, sensitive sites, and sensitive site buffers.

Continuous 50-foot No-Cut Personnel Layout:

- At BFW
 - ***1-2 Participants***
 - Responsible for setting up stations with string box or laser rangefinder and flagging, measuring the total length of the stream and lengths of cut and no-cut zones, ensuring personnel on the 50-foot no-cut line are perpendicular to the stream direction, and visibly placing the retractable reflector at the edge of BFW nearest those measuring buffer widths. Check for fish physicals and for the presence of fish to determine stream typing. Look for sensitive sites.
- At 50-foot No-Cut Edge-
 - ***All Remaining Participants***
 - Responsible for flagging the 50-foot no-cut zone at each appropriate station, looking for cut stumps within the buffer zone. Look for sensitive sites.

Additional Information:

- **Uppermost point of perennial flow (UMPPF, formerly perennial initiation point [PIP])**
 - These can vary from year to year.
 - CMP will use marking implemented by the landowner if it is available.
 - Use other indicators if the UMPPF is not marked, or if flagging is absent.
 - Measure from the outside of the headwall spring buffer to the center of the 56-foot radius leave tree area and check that inner area for UMPPF or headwall spring indicators. If UMPPF is located by this method, remeasure from the feature to the buffer edge to check compliance.
 - Use maps to find Ns stream confluences, base of outcrop, or other features that may indicate an UMPPF's location.
- **Other sensitive sites**

- No harvest is allowed within 56 feet of the confluence of two or more Np streams.
- No harvest is allowed on an alluvial fan.
- No harvest is allowed within 50 feet of the outer perimeters of soil zones perennially saturated by headwall or side-slope seeps.
- Any harvest in the designated no-cut buffer is not compliant for both FPA and rules, except for approved roads or yarding corridors.
- **Harvesting Np RMZs**
 - Look for equipment entry into the 30-foot equipment limitation zone (ELZ).
 - If there was entry, assess if there is greater than 10 percent soil exposure and if any mitigation for soil exposure was implemented.
 - No salvage is permitted in the buffered portion of an Np RMZ or associated sensitive sites.
 - "Appropriate length and configuration" of 50-foot no-cut buffer includes the total length and configuration of the RMZ, correct length upstream from Type F/N break, and minimum 100-foot no-cut reaches to count toward total required percentage to be buffered. Refer to Figures 11-12 for buffer requirements based on total stream length.
 - "Appropriate length and configuration" also includes proper layout for RMZs affected by stream-adjacent parallel roads.
 - Additional acres of leave trees are required equal to the acres occupied by an existing stream-adjacent parallel road within a Type Np RMZ or sensitive site buffer.
 - Refer to WAC 222-16-010 for the definition of stream-adjacent parallel roads.

Error Tolerance:

A 5 percent measurement error tolerance will apply to all zone widths within the RMZ. Stumps within the 5 percent error tolerance (measured from the center of the stump) will be considered compliant.

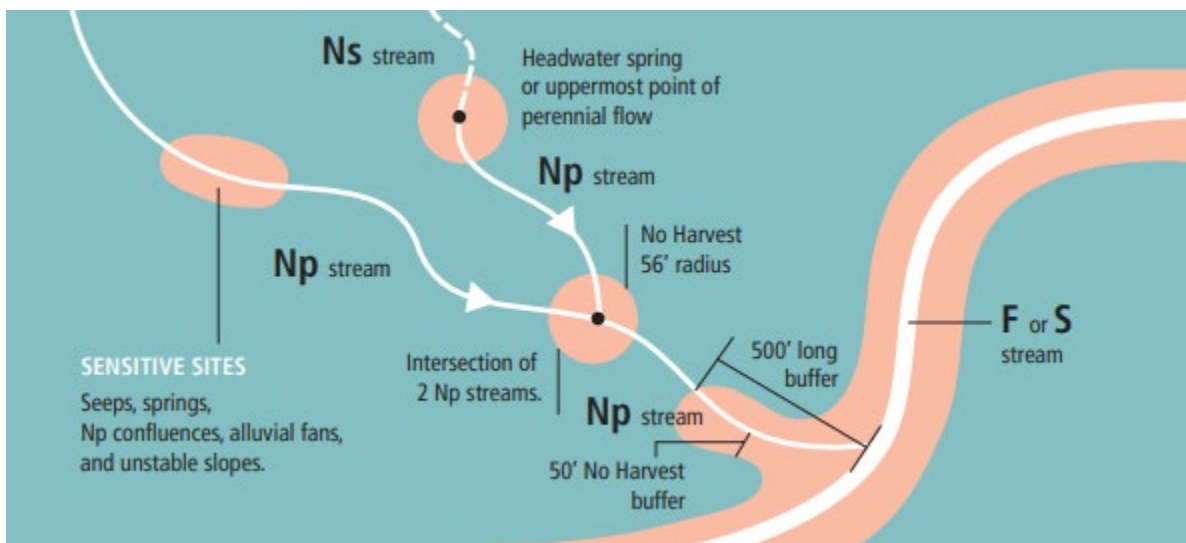


Figure 10: Example Np Buffer Scenario

Length of Type Np Water from the confluence of Type S or F Water	Length of 50-foot buffer required on Type Np Water (starting at the confluence of the Type Np and connecting water)
Greater than 1,000'	500'
Greater than 300' but less than 1,000'	Distance of the greater of 300' or 50% of the Type Np Water
Less than or equal to 300'	The entire length of the Np Water

Figure 11: Required no-harvest, 50-foot buffers on Type Np Waters.

Total length of a Type Np Water upstream from the confluence of a Type S or F Water	Percent of length of Type Np Water that must be protected with a 50-foot no-harvest buffer more than 500 feet upstream from the confluence of a Type S or F Water
1,000 feet or less	Refer to table in Figure 11 above
1,001 – 1,300 feet	19%
1,301 – 1,600 feet	27%
1,601 – 2,000 feet	33%
2,001 – 2,500 feet	38%
2,501 – 3,500 feet	42%
3,501 – 5,000 feet	44%
Greater than 5,000 feet	45%

Figure 12: Minimum percent of length of Type Np Waters to be buffered when more than 500 feet upstream from the confluence of a Type S or F Water

Np Streams (Eastern WA)

The field team will work to determine compliance regarding the 15 rules (divided by management strategy; all 15 rules on this form may not apply to one system in a harvest unit) for this prescription listed on the field form. Proponents in Eastern WA are required to select a management strategy for each Np stream system within a unit where harvest will occur within 50' of BFW; clearcut or partial cut. If one of these strategy options is not selected, it is assumed that harvest is not intended within 50' of the Np water, and no-cut is the default strategy.

The team will determine stream type, ELZ condition, and the location of headwall spring or uppermost point of perennial flow (UMPPF) if applicable, and then check RMZ requirements according to the selected strategy listed on the FPA. For no-cut strategy, they will check for cut stumps within the no-cut buffer. For clearcut strategy, they will check the length and distribution of clearcut and no-cut portions and the basal area of no-cut buffers. For partial cut strategy, they will check that leave tree requirements and target basal area were met.

Personnel Layout:

- At BFW-
 - *1-2 Participants*

- Responsible for setting up stations with string box or laser rangefinder and flagging, measuring the total length of the stream and lengths of cut and no-cut zones, ensuring personnel on the 50-foot no-cut line are perpendicular to the stream direction, and visibly placing the retractable reflector at the edge of BFW nearest those measuring buffer widths. In the absence of approved typing documentation (refer to Field Discussions and Decisions section) check for fish physicals and for the presence of fish to determine stream typing, if necessary. Look for sensitive sites.
- At 50-foot Edge-
 - ***All Remaining Participants***
 - Responsible for flagging the 50-foot no-cut zone at each appropriate station, checking for cut stumps within the buffer zone. Look for sensitive sites if applicable.
 - For partial cut strategy, they will verify that basal area of thinned RMZ meets the target.
 - For clearcut strategy, they will verify that basal area of no-cut RMZ meets the target.

Additional Information:

- **Headwall springs or uppermost point of perennial flow (UMPPF, formerly perennial initiation point [PIP])**
 - These can vary from year to year.
 - CMP will use marking implemented by the landowner if it is available.
 - Use other indicators if the headwall spring is not marked, or if flagging is absent.
 - Measure from the outside of the headwall spring buffer to the center of the 50-foot radius leave tree area and check that inner area for UMPPF or headwall spring indicators. If a headwall spring is located by this method, remeasure from the feature to the buffer edge to check compliance.
 - Use maps to find Ns stream confluences, base of outcrop, or other features that may indicate a headwall spring's location.
- **Other sensitive sites**
 - No clearcut harvest is allowed within 50 feet of the confluence of two or more Np streams.
 - No clearcut harvest is allowed within 50 feet of an alluvial fan.
 - No clearcut harvest is allowed within 50 feet of the outer perimeters of soil zones perennially saturated by headwall or side-slope seeps.
 - Any harvest in the no-cut buffer is not compliant for both FPA and rules, except for approved roads or yarding corridors.
- **Harvesting Np RMZs**
 - Look for equipment entry into the 30-foot equipment limitation zone (ELZ).
 - If there was entry, assess if there is greater than 10 percent soil exposure and if mitigation for soil exposure was implemented.
 - No salvage is permitted in the buffered portion of an Np RMZ or associated sensitive sites.
 - Determine which of the three strategies the proponent is using on the segment:
 - No-cut

- a. Ensure no timber was cut within 50 feet of BFW.
- Clearcut (Figure 13, right)
 - a. Ensure all clearcut harvest is at least 50 feet from all sensitive sites.
 - b. Measure length of no-cut and clearcut sections of Np segment.
 - Total no-cut length must be equal to total clearcut length.
 - Clearcut sections must be less than or equal to 30 percent of the entire segment length within the harvest unit.
 - Clearcut sections must be no more than 300 feet in continuous length and not within 500 feet of intersection with Type S or F waters.
- Partial Cut (Figure 13, left)
 - a. Basal area (BA) requirements are the same as EWA Inner Zone rules by habitat type. To meet basal area requirements, leave tree priorities, in descending order, are:
 - Ensure the largest 10 TPA were retained (look for larger stumps).
 - Up to an additional 40 TPA $\geq 10''$ DBH must be left where they existed (substituting smaller trees where 10'' trees are not present) if BA target has not been met with trees above.
 - Up to an additional 50 trees $> 6''$ DBH are required where they existed if BA target has not been met with trees above.
- Stream-adjacent parallel roads:
 - Refer to WAC 222-16-010 for the definition of stream-adjacent parallel roads.
 - For a road that is within 30 to 49 feet measured horizontally from the outer edge of BFW:
 - a. 100 feet total RMZ measured horizontally from BFW must be left. Both sides of the stream count toward the total.
 - b. If harvest only occurred on one side of the stream, then 50 feet of RMZ width measured horizontally from BFW must be left, regardless of presence of a stream-adjacent parallel road.
 - c. The width of the road is not counted as part of the total width of the RMZ.
 - d. Follow the priority order of required RMZ location for stream-adjacent parallel roads in WAC 222-30-022(2)(c)(i)(B).
 - For a road that is within less than 30 feet measured horizontally from the outer edge of BFW:
 - a. In addition to the above requirements, all trees between the stream and streamside edge of the road must be left.

Error Tolerance:

A 5 percent measurement error tolerance will apply to all zone widths within the RMZ. Stumps within the 5 percent error tolerance (measured from the center of the stump) will be considered compliant.

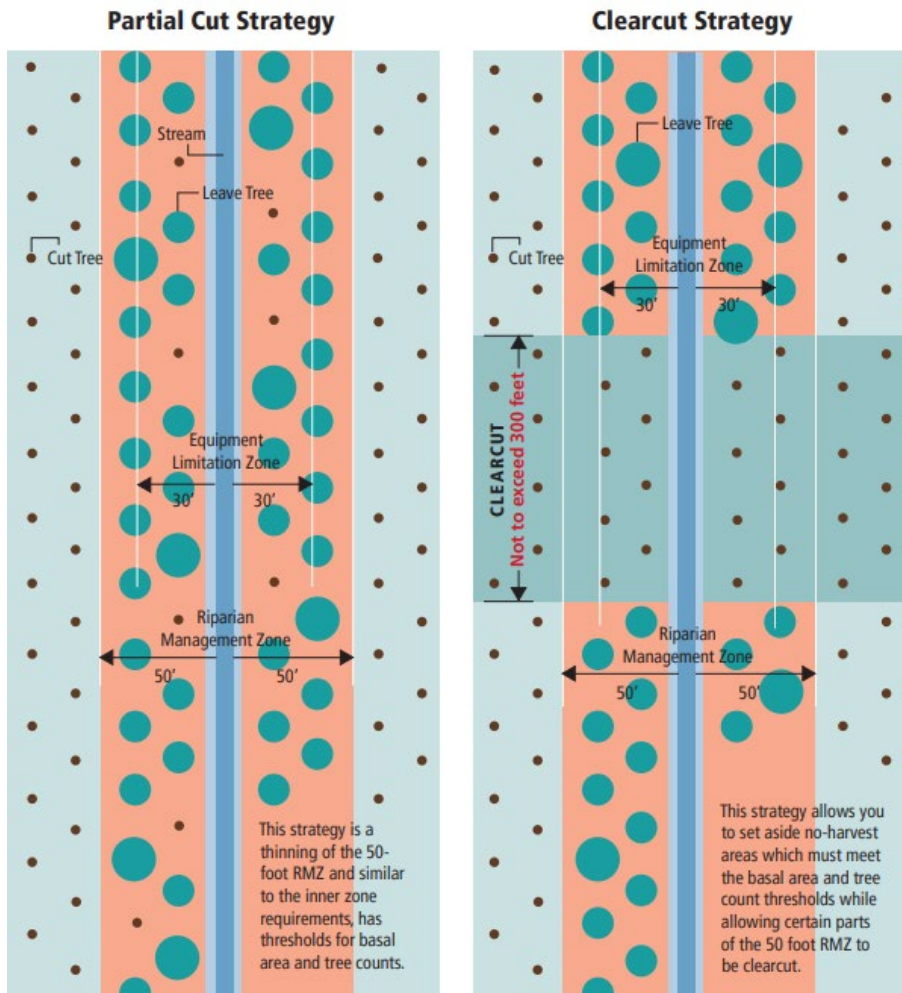


Figure 13: Eastern WA Np Partial Cut and Clearcut Strategies

Non-Fish Seasonal (Ns) Streams

The field team will work to determine compliance regarding the two rules for this prescription listed on the field form.

- Evaluate whether the stream was typed correctly (Appendix B), regardless of any designated protection for the stream (e.g., buffers exceeding Ns rule requirements).
 - If flowing, check for perennial obligate vegetation (Figure 14).
- Look for equipment entry into the 30-foot ELZ (Figure 15).
 - If there was entry, assess if greater than 10 percent of the soil within the ELZ was exposed, and if any mitigation for soil exposure was implemented.
 - If there was no disturbance, or 10 percent or less disturbance, the ELZ rule is not applicable.



Figure 14: Plants Associated with Riparian and Wetland Areas

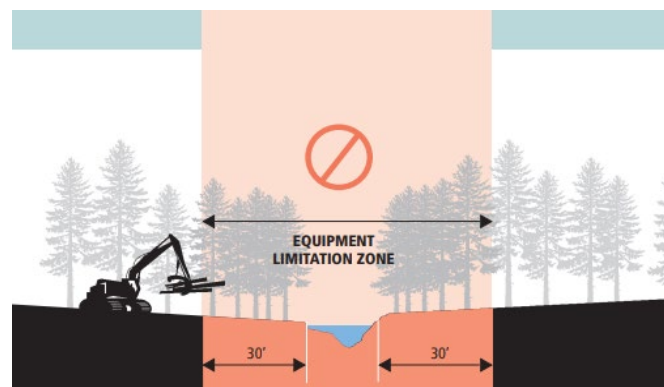


Figure 15: Equipment Limitation Zone

Non-Forested (Type A & B) Wetlands

The field team will work to determine compliance regarding the 14 rules for this prescription listed on the field form.

WMZ buffer widths depend on wetland size and type, and not all wetland sizes have WMZ requirements. The team will check that the wetland was not under-typed, seek evidence of ground-based equipment use within the minimum WMZ width, and tally leave trees by diameter ranges within the WMZ if necessary.

- Verify wetland type and size (Figure 17, Appendix A, Appendix B, and Board Manual Section 8). This includes determining whether periodically inundated and associated with other typed water, off-channel habitat, or default Type F physicals are present. Refer to wetland definitions in WAC 222-16-035 and Type 3 water definitions in WAC 222-16-031*(3).
- Measure WMZ per the wetland typing in the FPA (Figure 16 and Appendix A).
- If the FPA specifies that harvest will occur within the maximum width WMZ, verify compliance with the rules below for harvest in the WMZ with a variable width buffer:
 - Measure the wetland and applicable WMZ (Appendix A).
 - Tally 100 percent of the trees for each required size class in the WMZ.
 - Calculate trees per acre of each rule requirement:
 - Trees 6 to 12 inches DBH in Western Washington, or 4 to 12 inches DBH in Eastern Washington
 - Trees measuring over 12 inches but less than 20 inches DBH
 - Trees measuring over 20 inches DBH
 - If the WMZ laid out by the applicant does not have either 25 TPA larger than 12 inches DBH or five TPA larger than 20 inches DBH, you must check the maximum WMZ width per WMZ tables for trees and stumps that would fall into these categories. Refer to Figures 18-20 for examples of different WMZ layouts.
- If the FPA specifies that no harvest will occur within the maximum width WMZ, verify that no harvesting within the WMZ occurred. If harvesting did occur, the sample has deviated from compliance with the FPA and shall be assessed for rule compliance according to the rules above for harvest in the WMZ with a variable width buffer.
- Note: The minimum WMZ is not necessarily a no-harvest buffer, as long as leave tree requirements are met.

Error Tolerance:

A 5 percent measurement error tolerance will apply to all WMZ widths. Stumps within the 5 percent error tolerance (measured from the center of the stump) will be considered compliant.

Wetland Type	Acres of Non-Forested Wetland*	Maximum WMZ Width (feet)	Average WMZ Width (feet)	Minimum WMZ Width (feet)
A (including bogs*)	Greater than 5	200'	100'	50'
A (including bogs*)	0.5 to 5	100'	50'	25'
A (bogs only*)	0.25 – 0.5	100'	50'	25'
B	Greater than 5	100'	50'	25'
B	0.5 to 5	No WMZ Required	No WMZ Required	25'
B	0.25 to 0.5	No WMZ Required	No WMZ Required	No WMZ Required
Forested	No WMZ required. Low impact harvesting allowed. Additional restrictions apply. * For bogs, both forested and non-forested areas are included.			

Figure 16: Wetland Management Zone Widths

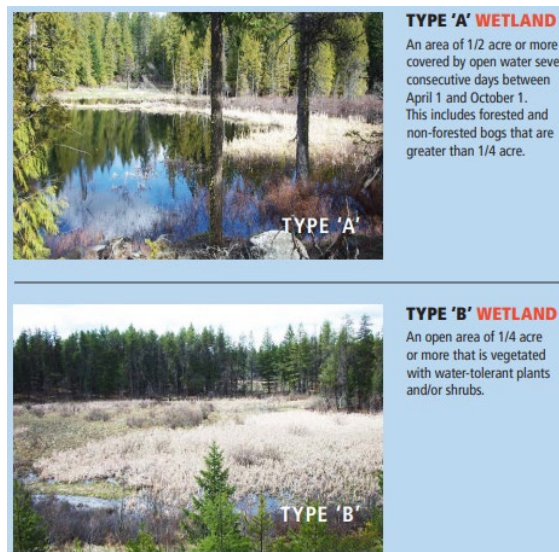


Figure 17: Type A and B Wetlands

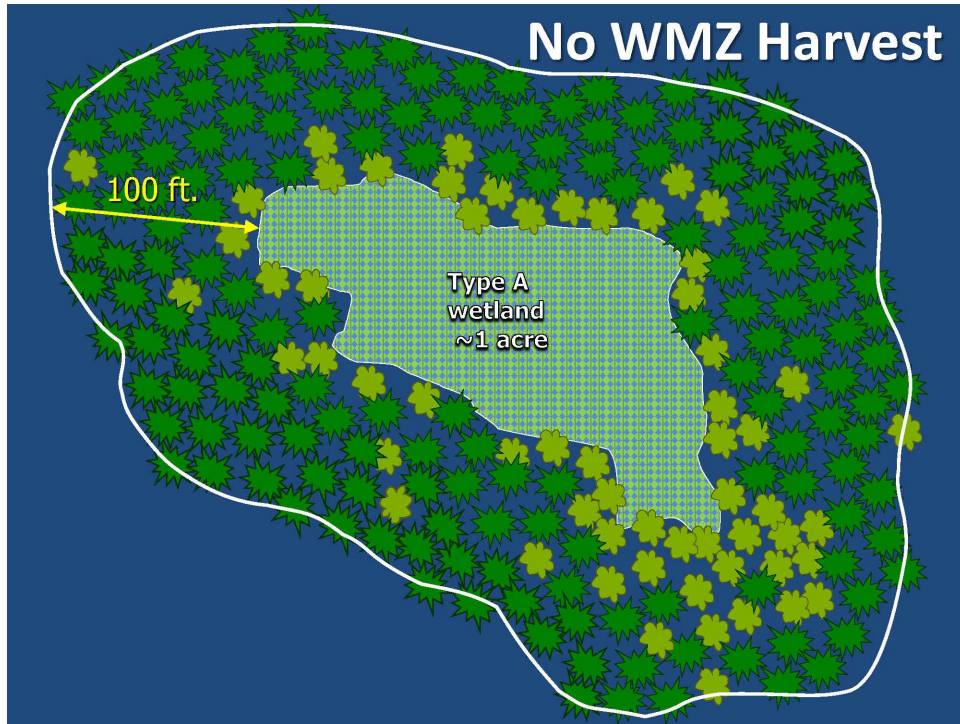


Figure 18: One-Acre Type A Wetland with No-Cut WMZ Sample Illustration

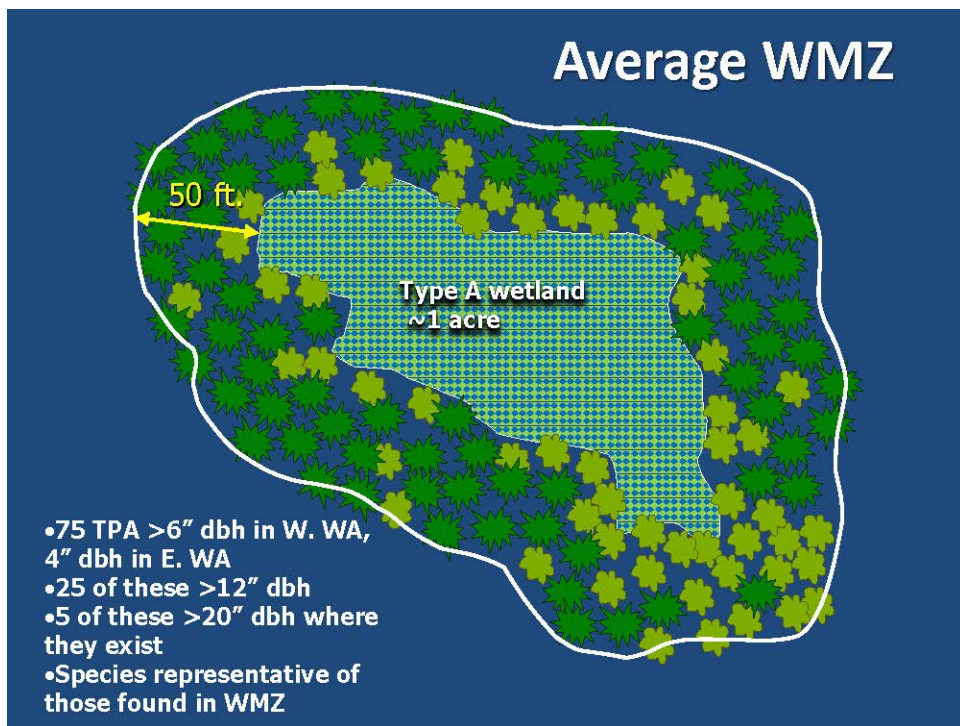


Figure 19: One-Acre Type A Wetland with Average WMZ Sample Illustration



Figure 20: One-Acre Type A Wetland with Partially Harvested Maximum WMZ Sample Illustration.

Forested Wetlands

The field team will work to determine compliance regarding the four rules for this prescription listed on the field form.

- Verify type and size (Figure 21, Appendix A, Appendix B, and Board Manual Section 8). This includes determining whether periodically inundated and associated with other typed water, off-channel habitat, or default Type F physicals are present. Refer to wetland definitions in WAC 222-16-035 and Type 3 water definitions in WAC 222-16-031*(3).
 - Forested bogs are considered a Type A wetland and would be under-typed if categorized as a forested wetland.
 - For forested wetlands, crown closure requirements must be met by merchantable tree species.
 - For example, a wetland containing less than 30 percent crown closure of Douglas-fir or other merchantable conifer species and over 30 percent crown closure of red alder in a region of the state with no alder market would be considered a non-forested wetland.
 - Crown closure of merchantable species of tree seedlings and saplings in the wetland will be based on estimated percentage crown closure at maturity.
- Verify that harvest within the forested wetland was limited to low impact systems unless otherwise approved in writing by DNR. If no harvest occurred in the forested wetland, this rule is not applicable.
 - Low impact systems include the following:
 - Reaching into the wetland with equipment while keeping tracks and wheels out
 - Laying down slash to reduce potential for rutting
 - Cable yarding cut trees out of the wetland
- If a forested wetland is larger than three acres, verify that approximate boundaries were delineated and mapped.



Figure 21: Forested Wetlands

Roads

1. Review all new construction (entirety to be walked or driven), culvert installations (including replacements), and up to one field days' worth of abandonment, including Type N crossings. Decommissioned roads (i.e., roads that started the abandonment process without reaching the final step of receiving official FP abandonment approval) should be dropped and replaced.
2. Read roadwork information included in the FPA carefully to ensure that everything is included.
3. Each segment of road construction will be assessed for compliance separately. Thus, if construction includes four spurs, each spur will be assessed independently for compliance with applicable form questions. It is possible to have four different answers for compliance in this scenario. **Compliance is recorded as a fraction for roads prescriptions.**
 - a. For example, if four different segments of road were assessed and three out of four were compliant for a specific rule, record $\frac{3}{4}$ for that rule in the compliant column and $\frac{1}{4}$ for that rule in the deviation column.
4. Further, each culvert installation (including replacements) and stream crossing will be assessed separately. Compliance or deviations from compliance will be assessed on each individual installation within a road spur.
 - a. For example, if six culverts were installed with five compliant for one rule question and one deviating from compliance for the same question, record $\frac{5}{6}$ in the compliant column and $\frac{1}{6}$ in the deviation column for that rule.
5. A dot grid system is recommended for use in field notes when reviewing multiple road segments or culvert installations. Refer to the "References" section of Appendix D for an example of the dot grid system.
6. Questions 2 through 4 in the Construction in Wetlands section of the form are progressive options, with 2 being the most preferred and 4 being the least preferred out of the options we assess. These questions do not cover all options in WAC 222-24-015(1), so it is possible that none may apply for a particular segment. However, no more than one of these form questions should apply to a single road segment or single wetland crossed by a road segment.

Haul Routes

1. Safety is of paramount concern, especially when reviewing active haul routes. When a haul route is active, use CB radio for communicating location by mile marker, park in visible locations, and wear high-visibility PPE. The goal is to attempt review of at least some active haul routes. However, if traffic is too heavy and it is not safe to review, drop the unsafe haul route, and the next sample on the list will be chosen.
2. FPAs selected for haul route prescription must include timber harvest and haul of timber products (i.e., not FPAs for only roadwork, stream crossing construction or maintenance, cutting and leaving trees on site for habitat restoration, etc.).
3. Weather conditions at time of survey should be recorded on the cover page. Due to logistical constraints of the program, haul route assessments may occur at any time of year in a variety of weather conditions. If active delivery is not visible due to dry conditions, delivery potential will still be assessed to the best of the reviewers' abilities. Many indicators of previous delivery or potential delivery contributing factors are recognizable in dry conditions, although potential sediment delivery level may be more difficult to accurately assess. When sediment delivery level cannot be agreed upon, the "no consensus" determination will be used with further details provided in the comments section by all participants with differing opinions.
4. Haul routes five miles or less from the harvest unit to public roads will be assessed in full (100 percent of the haul route). Road segments across non-forestland or non-DNR jurisdiction (e.g., county roads, federal roads, and roads through rangeland in eastern WA) are not surveyed and will not be included in the total. For haul routes farther than five miles from harvest units to public road, randomly select 0.5-mile segments throughout the entire haul route to be surveyed to total five miles in length. If more than one haul route is identified on an FPA, use the longest route. When possible, begin the haul route survey from the landing within the selected FPA's harvest unit farthest from a public road.
5. Haul routes will be selected from the FPAs already selected for review for other prescriptions. Haul routes will be reviewed by using the highest ranked FPA selected in a region for another prescription and working down the list until the target number of haul routes or haul route mileage for the region have been completed. Because some haul routes may be used by multiple FPAs on a road system that could span different ownerships, it is important to note that the use of the haul route by a different FPA than the one for which it is chosen is of no consequence. As with other Compliance Monitoring prescriptions, haul routes are not tied to landowner or operator in the data collection or analysis.
6. Segment data will be recorded in 0.1-mile increments.
7. No stream typing surveys will be done as part of any haul route survey.
 - a. For problem areas identified in the vicinity of a water resource whose type, or lack thereof, is not known at the time of review by the field team:
 - i. If supporting information/documentation or a quick review of the channel in close proximity to the haul route is not enough to settle the matter of typed vs. non-typed, the decision on whether the resource will be reviewed as typed will be resolved on a case-by-case basis by

collaboration of the field team using professional judgement. Many scenarios are too site-specific for generic guidance.

8. The haul route survey form describes several deviation categories (Figures 22-23). The code shorthand in the left column of the table in Figure 22 can be used to quickly note contributing factors. Write any additional information regarding potential or observed delivery in the comments section.
9. Record all sites of concern, such as faulty cross drains, inadequate stream crossings, and any other relevant information in comments.
10. Use particular care when assessing delivery potential at stream crossings, at drains within 200' upslope from streams or wetlands, and along stream-adjacent parallel roads. At a minimum it is usually necessary to stop at all stream crossings and walk the road upslope to the next cross drain to assess any maintenance needs.

Code	Contributing Factors	Definition/Description
(A)	Inadequate erosion control measures	Banks not vegetated or armored, lack of or inadequate use of silt fencing, sediment traps, or other erosion control measures such that sloped soils may erode into typed water.
(B)	Sediment from stream-adjacent parallel road	Delivery or potential to deliver to stream flowing parallel to road.
(C)	Inadequate/faulty/non-functioning cross drainage	Ineffective, faulty, non-functioning, or insufficient frequency of cross drains, ditch outs, or drivable dips provided.
(D)	Obstructed or bermed ditchline	Large woody debris, berms, or other obstruction(s) prevents water from dispersing onto forest floor or makes drainage ditches ineffective.
(E)	Stream- or spring-intercepted water	Stream or spring flow/seep is captured into ditch line rather than passed across road to stable portions of forest floor.
(F)	Wetland-intercepted water	Wetland drainage captured into ditch line rather than passed across road. Includes not maintaining connection for wetlands.
(G)	Contaminated ditchwater	Ditch-captured sediment channeled or flowing into typed water.
(H)	Ruts or inadequate crown	Vehicle or equipment rutting damage or poor crown curve that interfere with drainage to forest floor.
(I)	Driving in ditchline	Vehicle damage to ditch line affecting vegetative filtering and resuspending sediment for transport.
(J)	Haul on native surface or inadequate rock	Excess sediment produced and running off to typed waters.
(K)	Eroding/failing slopes	Water channeled toward, adjacent to, or into potentially unstable slopes.
(L)	Road fill failure	Collapse/failure of road fill.
(M)	Cutslope failure	Collapse/failure of cutslope.
(N)	Other (describe in comments)	Anything not covered by other categories.

Figure 22: Haul Routes Sediment Delivery Contributing Factors Options

Haul Routes Survey Data		
Sediment Delivery Level	No Delivery	No Potential or Actual - complete disconnection of overland flow to typed waters.
	De minimis	Overland flow from roads reaches, or is expected to reach, typed waters, but any sediment delivery is unlikely to occur at a level that would create a visible plume during foreseeable precipitation events.
	Low	A sediment plume is observable, or expected to be observable, under foreseeable precipitation events, around the site of entry (distance downstream less than one channel width) only and is not expected to magnify over time.
	Medium	Sediment plume is observable, or expected to be observable, under foreseeable precipitation events at the reach scale broadening and occupying much of the channel width as it moves downstream but becoming inapparent at the reach scale (a reach would be approximately 10 channel widths in length).
	High	Substantial violations of turbidity criteria or significant visible plumes that occupy the channel and extend beyond the reach scale (around multiple stream bends, for example).
	No consensus	Team members do not agree. Note categories/levels disagreed upon with details in comments.
Delivery Observation	Actual Delivery	Actual delivery observed in action at time of review.
	Potential Delivery	Indicators of potential or previous delivery observed without adequate maintenance completed to prevent future delivery.
Jurisdiction	FP-regulated forest land	Road crossing private-, state-, county-, or municipality-owned forest land regulated under the Forest Practices Act.
	Non-FP-regulated land	Should not be assessed as part of haul route. Includes roads crossing Federal or Tribal forest land, non-forested land (not meeting the DNR definition of forest land), or roads managed by a governmental transportation authority (public roads).

Figure 23: Haul Routes Sediment Delivery Level Options Survey Data

Appendix A. Stream and Wetland Measurements

Stream Measurements

- Stream measurements serve two purposes: to determine bankfull width (BFW) (Figure 24) and gradient (%), and to determine a starting point for RMZ or WMZ measurements. BFW measurements are not necessary if the channel is obviously wider or narrower than 10 feet in Western Washington, or obviously wider or narrower than 15 feet in Eastern Washington.
 - Measurements start at 0+00. This is where the first RMZ measurement should be taken. If the stream segment starts near a road or culvert that may influence BFW, do not start BFW measurements here, even though an RMZ measurement may be taken. The goal is to get at least 10 measurements, as evenly spaced as possible, that are **representative** of the stream's BFW. Increments of 100-foot or 50-foot stations are common. Recording a representative measurement will override spacing goals. Clearly flag all locations where BFW was measured and note the corresponding station in permanent marker on the flagging (0+00, 1+00, 2+00, etc.).
 - For short segments (less than 300 feet long):
 - It may be excessive to take 10 evenly spaced measurements. Take as many measurements as are practical, as long as they are representative.
 - For medium segments (greater than 300 feet, but less than 1,000 feet long):
 - First station is 0+00. May take a BFW measurement here if it is representative.
 - Use stationing that will result in at least 10 relatively evenly spaced measurements, keeping in mind that obtaining a representative measurement will override spacing requirements. For segments between 500 and 1,000 feet, use 50-foot stations.
 - If BFW is not in doubt and no BFW measurements will be taken, use 100-foot stationing to facilitate RMZ width measurements.
 - For large segments (greater than 1,000 feet long):
 - Stationing will be 100 feet apart.
 - If no BFW is taken at 0+00, next station will be 0+50. Start BFW measurements here.
 - If BFW is not in doubt and no measurements will be taken, maintain 100-foot stationing to facilitate RMZ measurements.
 - Supplemental or intermediate stations should be added as needed where sharp turns or meander bends occur, to ensure that stumps and leave trees are attributed to the correct zones. Document added stations in field notes, and make sure participants are aware that these are non-standard stations to prevent double counting of leave trees and stumps.
- If terrain, brush, blowdown etc., does not accommodate above stationing guidelines, use what works for visibility and note in field notes any offset distances and directions. After an offset station, continue with standard stationing. If measuring BFW, you must still attempt to use guidelines above. If measurements cannot be taken safely, consider dropping the segment and selecting a replacement.

- Compliance of stream BFW will use the standard 5 percent measurement error tolerance as with other measurements, except in this case the 5 percent applies to the *average* width found. For example, streams found to average Greater Than or Equal to (GTE) 10.5 feet in Western WA or GTE 15.75 feet in Eastern WA are considered large streams.
- Overlapping RMZs (refer to diagram in Appendix C)
 - Continue flagging through overlapping RMZs. Note on flags which segment they are for to avoid confusion during tree counts.
 - Trees in overlapping RMZs count toward the leave trees for each stream in its respective RMZ.
- Starting point should be determined by marking on the ground, landowner knowledge, or using the FPA and associated maps to determine the location.
 - If starting point is difficult to determine, mark in the field and document in notes the reasoning for the decision. If decision may affect compliance, it might be best to drop the segment and select a different one.
 - If segment begins at a confluence, begin measurements there to ensure that leave trees in the overlapping zones are counted.
- Channel Migration Zones (CMZs) and alluvial fans
 - Most types of CMZs apply only to S or F waters.
 - Alluvial fans are the only type of CMZs that apply to Np waters.
 - CMZ locations are identified by determining if they meet the definition of a CMZ as provided by WAC 222-16-010. The field form from Board Manual Section 2 is used in this determination. This field form is a hierarchical flow chart that starts at the top and progresses to the bottom (i.e., the first criterion must be satisfied before proceeding to the next criterion, and so on).
 - If the proponent stated on the FPA that there was no CMZ, and there does not appear to be one, start RMZ measurements at BFW.
 - If a CMZ is determined to be present, begin measurements at the outer edge of CMZ.
 - If CMZ presence is indeterminate, take measurements from both BFW and the outer edge of potential CMZ for comparison when the CMZ determination is made. A DNR expert will be called to visit the site and determine CMZ presence. Compliance Monitoring participants are encouraged to attend, but only for informational purposes.
 - Document on field forms if BFW location or CMZ presence conflicts with approved FPA.

Wetland Measurements

- Wetland measurements serve to validate WMZ requirements based on the total size of the wetland by type for non-forested wetlands, and to determine mapping requirements for forested wetlands.
- Use GPS to traverse wetland, or laser rangefinder to measure widths along the wetland to calculate the area in acres. Use Board Manual Section 8 for guidance in delineating wetland edges. It may also be possible to roughly estimate the total wetland size by use of aerial imagery prior to the field visit. If using this method, on-the-ground verification may still be necessary.

- For most situations, approximate mapping meets rule requirements.
- For non-forested (Type A or B) wetlands:
 - Measure WMZ per the wetland typing in the FPA (Figure 16).
 - Follow boundary as marked on the ground by the applicant, if available.
 - Calculate WMZ acreage using the **average** width specified in the WMZ table.
 - Measure variable widths and distances of the WMZ and record in notes.
 - Refer to the section “Non-Forested (Type A & B) Wetlands” for guidance on assessing compliance with leave tree requirements.

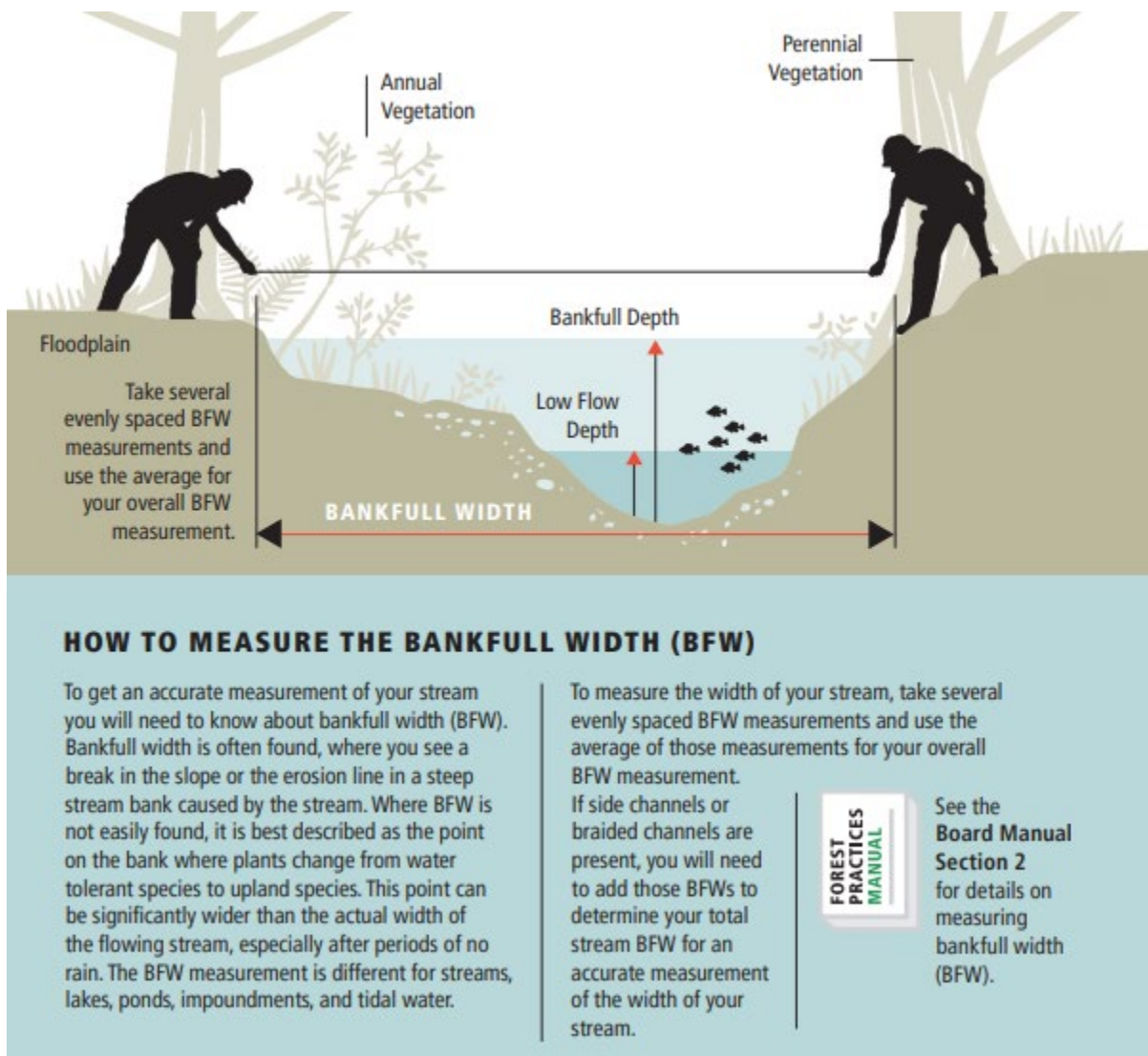


Figure 24: Bankfull Width Measurements

Appendix B. Water Typing

- The CMP bases stream typing on physical characteristics, absent any supporting documentation (Water Type Modification Form, Inter-Disciplinary Team (IDT) Informal Conference Notes, or other IDT-related documentation). The CMP does not base any stream typing calls on DNR's hydro layer alone. The prescription selection will be based upon stream typing calls made by applicants in their FPA. When there is a discrepancy between the type of a segment listed on the application and the type listed on a Water Type Modification Form (WTMF) or Water Type Classification Worksheet (WTCW), the WTMF/WTCW water type shall take precedence.
- The CMP does not challenge supporting documentation originating on or after March 20, 2000 for stream typing decisions. Acceptable documentation includes, but is not limited to, an approved WTMF, protocol survey following guidelines outlined in Board Manual Section 13, or ID team documentation. ID team visits may be documented in several ways, including an ICN, email, application attachments, or the additional information section of approved FPAs.
- Type Ns streams as well as Type A and B wetlands can be difficult to assess during the wet season. Presence of certain species of perennial vegetation can often help assess water type when visiting at a less favorable time of year (refer to Board Manual Section 8 for plant indicator lists). In the absence of conclusive evidence to the contrary, Ns streams and non-forested wetland delineation are based upon the FPA information. **This applies only to Ns vs. Np, not to Ns vs. F, or only to wetlands lacking an inlet/outlet, or wetlands with inlets or outlets that do not meet F physicals.** For the following example scenarios, a determination of compliant or indeterminate would be acceptable:
 - Scenario 1: A resource labeled as a Type B wetland on the FPA may have half an acre of open water on the day of field review during the wet season. Type A wetlands must have at least 1/2 acre of open water for at least seven consecutive days between April 1 and October 1 (except for bogs, which can be between 1/4 acre and 1/2 acre and do not have the open water requirement), and the field review team is only on site for one day. Therefore, conclusive evidence (i.e., the knowledge that the half acre of water is present for seven consecutive days) with which to call the wetland typing not compliant is not available.
 - Scenario 2: A stream labeled as Ns on the FPA may still have flow on the day of field review during the wet season. This stream may dry up later in the year, and perennial flow is not often possible to determine conclusively on one day during the wet season.
- For possible or actual discrepancies regarding water or wetland typing, include a description on the field form. In the past, CMP used the Supplemental Water Information Form (SWIF). However, due to redundancy between information on this form and field forms and notes, the current procedure is to note this information on the field form rather than on a SWIF.

Appendix C. Overlapping RMZs

Trees in overlapping RMZs count toward the leave trees for each stream in its respective RMZ. Where the Outer Zone of stream “A” overlaps a Core Zone or a no-harvest Inner Zone of stream “B”, you can count trees in these two zones for the 20 trees per acre in the Outer Zone of stream “A”.

Diagram for Sampling Stream “A” RMZ

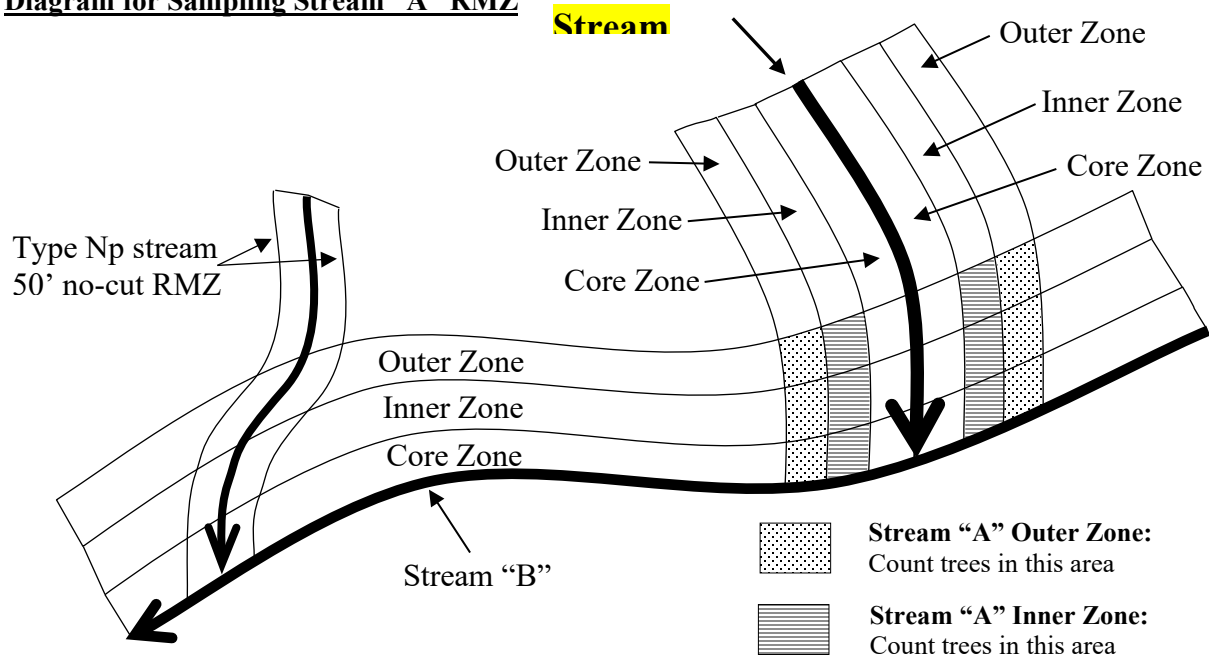
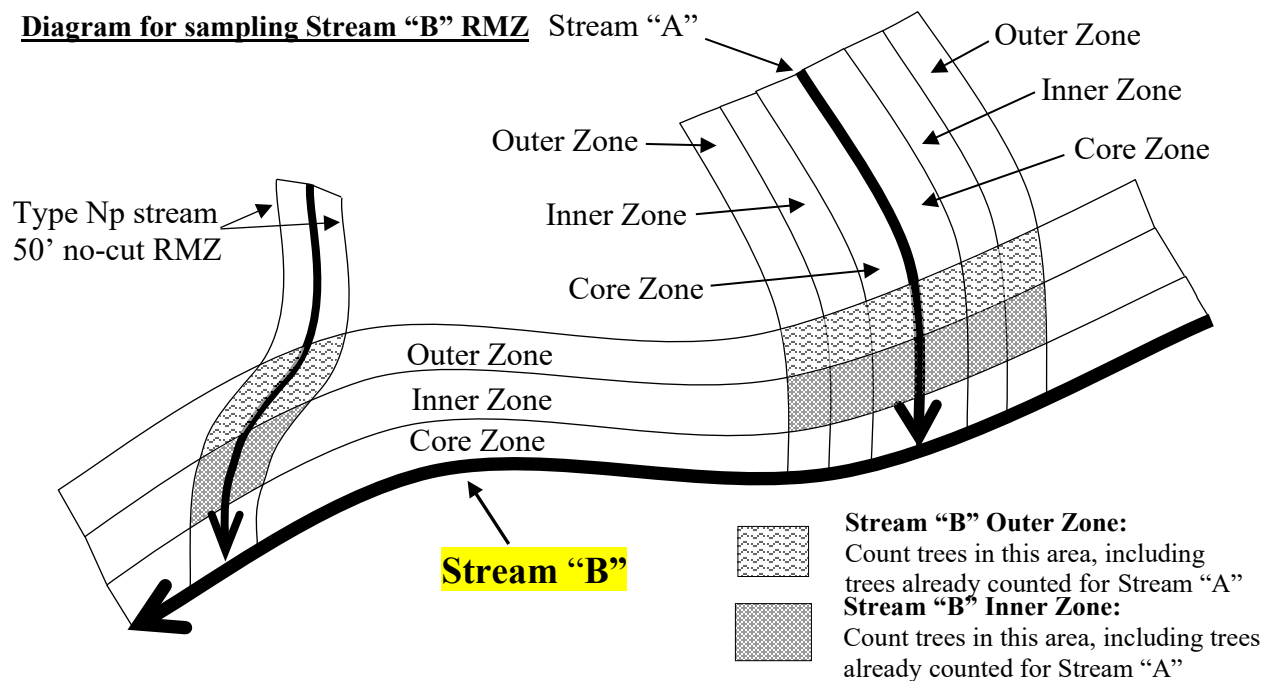


Diagram for sampling Stream “B” RMZ



4. Deviation Severity Rating Suggested Guideline Tables:

Core Zone

	LOW 1-10 yard(s) sediment 1-2 trees	MODERATE 11-20 yards sediment 3-7 trees	HIGH >20 yards sediment >8 trees
SHORT-TERM 1-2 years	Small Impact	Mod. Impact	High Impact
MOD-TERM 3-5 years	Small Impact	Mod. Impact	High Impact
LONG-TERM >5 years	Mod. Impact	High Impact	High Impact

Inner and Outer Zones

	LOW 1-10 yard(s) sediment 1-5 trees	MODERATE 11-20 yards sediment 6-10 trees	HIGH >20 yards sediment >10 trees
SHORT-TERM 1-2 years	Small Impact	Mod. Impact	High Impact
MOD-TERM 3-5 years	Small Impact	Mod. Impact	High Impact
LONG-TERM >5 years	Mod. Impact	High Impact	High Impact