

RIPARIAN MANAGEMENT

APPLICABLE OREGON FOREST PRACTICES RULES

Water protection rules: Purpose, goals, classification and riparian management areas

- 629-635-0100: Purpose and goals
- 629-635-0120: Watershed-specific practices for water quality limited watersheds and threatened or endangered aquatic species
- 629-635-0100: Water classification
- 629-635-0210: Designation of waters; notice to landowners; reconsideration
- 629-635-0220: Geographic region
- 629-635-0300: Riparian management areas and water quality protection measures
- 629-635-0310: Riparian management area measurements for streams and wetlands

Water protection rules: Vegetation along streams

- 629-643-0000: Vegetation retention goals for streams; desired future conditions
- 629-643-0100: Western Oregon standard practice vegetation retention prescriptions for Type F and Type SSBT streams
- 629-643-0105: Western Oregon standard practice vegetation retention prescriptions for Type N Streams
- 629-643-0120: Eastern Oregon standard practice vegetation retention prescriptions for Type F and Type SSBT streams
- 629-643-0125: Eastern Oregon standard practice vegetation retention prescriptions for Type N streams
- 629-643-0130: Standard practice requirements for small Type N streams
- 629-643-0135: Standard practice vegetation retention for seeps and springs, side channels and stream-associated wetlands
- 629-643-0140: Small forestland owner minimum option vegetation retention prescription requirements
- 629-643-0141: Western Oregon small forestland owner minimum management option prescription
- 629-643-0142: Eastern Oregon small forestland owner minimum option prescription
- 629-643-0143: Small forestland owner small Type N streams vegetation requirements
- 629-643-0145: Small forestland owner minimum option prescription for seeps and springs
- 629-643-0150: Type D vegetation retention requirements
- 629-643-0200: Placing large wood key pieces in Type F or Type SSBT streams to improve fish habitat
- 629-643-0300: Alternative vegetation retention prescriptions
- 629-643-0400: Site-specific vegetation retention prescriptions for streams and riparian management areas
- 629-643-0500: Reforestation within stream riparian management areas

Water protection rules: Riparian management areas and protection measures for significant wetlands

- 629-645-0000: Riparian management areas and protection measures for significant wetlands
- 629-645-0010: Live tree retention for significant wetlands
- 629-645-0020: Site-specific vegetation retention prescriptions for significant wetlands
- 629-645-0030: Soil and hydrologic function protection for significant wetlands
- 629-645-0040: Understory vegetation retention for significant wetlands
- 629-645-0050: Snag and downed wood retention for significant wetlands

Water protection rules: Riparian management areas and protection measures for lakes

- 629-650-0000: Riparian management areas and protection measures for lakes
- 629-650-0005: Written plans for operations near large lakes
- 629-650-0010: Live tree retention for lakes
- 629-650-0020: Soil and hydrologic function protection for lakes
- 629-650-0030: Understory vegetation retention for lakes
- 629-650-0040: Snag retention and downed wood retention for lakes

Water protection rules: Protection measures for "other wetlands," seeps and springs

- 629-655-0000: Protection measures for "other wetlands," seeps and springs

Streams, lakes, wetlands and other riparian areas can be altered by forest practices. This chapter will help you identify, classify and lay out protection for these areas.

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RIPARIAN AREAS ARE IMPORTANT ECOLOGICAL ZONES

Riparian areas are ecological zones at the interface of land (terrestrial) and water (aquatic) habitats. They are found along the edges of streams, lakes, reservoirs, springs, marshes, bogs, ponds and seeps. Riparian areas contain unique plants, provide habitat to important species, cycle nutrients, regulate the delivery of solar energy, and filter pollutants from water bodies.

The Oregon Forest Practices Act focuses protections around riparian areas because of the unique concentration of valuable public resources and the potential for forestry activities to impact them. The overall goal of riparian area protections is to continue to grow and harvest trees while ensuring:

- Non-point-source pollution (sedimentation) resulting from forest operations does not impair water quality.
- Vegetation that maintains, enhances or restores water quality, and that provides aquatic habitat components such as shade, large wood and nutrients are established and retained.
- Live trees of various species and sizes, snags and downed wood are present within riparian management areas to shade the water and provide habitat for fish and other aquatic species.

If your forest practice activity occurs adjacent to riparian areas, this section will help you identify and classify water bodies and follow the required protections.



WATER CLASSIFICATION

The requirements of the Oregon Forest Practices Act are intended to protect fish, wildlife and water quality when forest practice activities occur near water.

Protection measures are based on how the water body near an operation is classified, as well as the geographic region where it is located.

Waters of the state

Waters of the state are lakes, bays, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marshes, wetlands, inlets, canals, and the Pacific Ocean within the territorial limits of the State of Oregon.



Stream identification and classification

A stream is a channel with a distinct bed or banks scoured by water, that serves to confine water and that contains flowing water during some portion of the year. For the purposes of the Oregon Forest Practices Act (OFPA), if scouring and a distinct channel are not present, the flowing water is not considered a stream. Streams may include beaver ponds, oxbows and side channels, if they are connected by surface flow to the stream during a portion of the year. There are five stream types, based on use or seasonality, and three stream sizes, which result in 13 possible classifications.

Stream types

Type F streams have fish and may also be used for domestic water.

Type SSBT streams have salmon, steelhead or bull trout use.

Type D streams are used for domestic water, have no fish and are more likely to be small streams.

Type N streams have no fish.

Type Np streams are small Type N perennial streams that flow water year-round and have no fish or domestic use.

In eastern Oregon, Type Np streams are further classified as terminal or lateral. Terminal Type Np streams are the largest Type Np stream by drainage basin that is immediately upstream of a Type F or Type SSBT stream. Lateral Type Np streams include all other Type Np streams within a drainage basin that are not terminal.

Type Ns streams are small, seasonal Type N stream reaches that have flowing water only during certain times of the year.

Stream sizes

Small streams have an average annual flow of 2 cubic feet per second or less, or have a drainage area less than 200 acres. They generally have widths less than 7 feet.

Medium streams have an average annual flow greater than 2 and less than 10 cubic feet per second. They generally have widths of 7 to 12 feet.

Large streams have an average annual flow greater than 10 cubic feet per second. They generally have widths greater than 12 feet.

The combination of size and use designates each stream. For example, a medium-sized stream with fish would be called a “medium Type F” stream.

Geographic regions for water protection

The protection requirements for streams differ according to the geographic region where the stream is located: western Oregon or eastern Oregon, divided by the Cascade Crest. Refer to the region map in the Introduction chapter.

Determining stream and wetland classification

The Oregon Department of Forestry's (ODF) FPA Streams and Steep Slopes Viewer (oregon.gov/odf/working/pages/fpa.aspx) provides digital access to statewide maps of streams, lakes and significant wetlands of known classification size, along with information such as stream size, domestic use, fish distribution, flow duration (perenniality), channel end, and modeled end of fish use released in 2023. A flow permanence model is scheduled to be released in 2025. Field surveys can be used to verify or overwrite the modeled results for stream seasonality, stream channel end, and fish use (see page 98).

Wetlands

Wetlands are areas that are frequently inundated or saturated by surface water or groundwater, which results in local vegetation that can tolerate or thrive in saturated soils. There are three major categories of wetlands:

SIGNIFICANT WETLANDS

- wetlands greater than 8 acres
- estuaries
- bogs
- important springs in eastern Oregon

STREAM-ASSOCIATED WETLANDS

These are wetlands less than 8 acres that are next to a stream. Protection requirements are based on the classification of the stream they are connected to.

OTHER WETLANDS (INCLUDING SEEPS AND SPRINGS) OF TWO TYPES

- those greater than one-quarter acre
- those less than one-quarter acre (most seeps and springs are this type)



Lakes

Lakes are bodies of year-round standing open water. They do not include water bodies developed for human needs that are not part of a stream, such as farm ponds. There are two kinds of lakes:

- large lakes, which are greater than 8 acres
- all other lakes

RIPARIAN AREA PROTECTIONS

In the Oregon Forest Practices Act, riparian areas include the ground along waterways where vegetation and microclimate are influenced by year-round or seasonal water, associated high-water tables and soils that exhibit some wetness. To help protect water bodies during and after forest practice activities, riparian management areas (RMAs) are regionally specified and have requirements for retaining trees, snags and understory vegetation, and for limited or modified practices that reduce disturbances from forestry activities that could impact aquatic habitat and water quality. Protection measures apply even when the water body is dry.

There are two major types of riparian protections: tree retention areas, where cutting trees is limited; and equipment limitation zones (ELZs), where disturbance from equipment use is minimized, but trees can still be harvested. These protections and how they apply in your situation will be discussed more in the following sections. The rules outline minimum protections; you can always choose to leave more trees and vegetation than is required.

Riparian management areas (RMAs)

In Oregon, RMAs are designated in the OFPA to provide protection to the riparian zone and waterways. RMAs are areas along each side of specified waterways where vegetation retention and special management practices are required for the protection of water quality, hydrologic functions, and fish and wildlife habitat.

Tree retention areas

Tree retention areas are a type of RMA where the cutting of trees is limited. Most or all the trees in a tree retention area must be retained. A primary goal of tree retention RMAs is to develop more streamside areas with mature forest characteristics. Such forests shade the stream channel to help keep the water cool for fish, and provide large logs that fall into the stream for fish habitat; channel-influencing root masses; snags for wildlife; and leaves, needles, branches and insects that feed aquatic life.

Equipment limitation zones (ELZs)

An equipment limitation zone (ELZ) is a type of RMA protection for streams that extends the full length of a stream channel where other tree retention areas are not required. Equipment use and tree removal is permitted within the ELZ, but operators are expected to minimize ground and vegetation disturbance. If soil disturbance of

Riparian management areas protect key resources.



Riparian management area plants, down logs and soils serve as a filter, trapping pollutants and keeping them from entering streams, wetlands and lakes.



Many wildlife species, such as this Columbia torrent salamander, rely on riparian management areas for the necessities of life: food, water, protection from predators and a place to rear young.

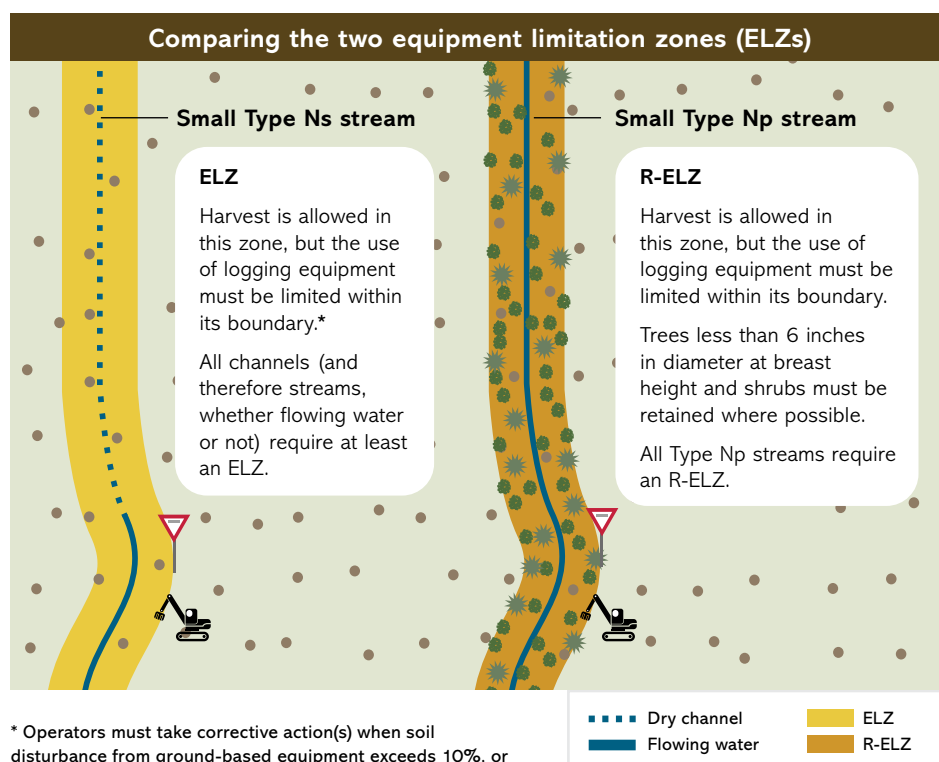
the ELZ area exceeds 20% in cable portions of a timber harvest unit, and 10% in ground-based portions of a harvest unit, remediation is required in consultation with an Oregon Department of Forestry (ODF) stewardship forester. A retention-equipment limitation zone (R-ELZ) applies to all Type Np streams and is an ELZ with retention of all trees less than 6 inches in diameter at breast height (DBH) and all vegetation, where possible. ELZs and R-ELZs are 35 feet wide in western Oregon and 30 feet wide in eastern Oregon. These widths apply to both sides of the stream, measured from the edge of the active channel (high-water mark). These widths are roughly equivalent to a boom length of reach for commonly used logging equipment.

During timber harvests, all stream channels receive at least an ELZ, and all Type Np streams have at least an R-ELZ.

Note that in order to be identified as Type Np for purposes of protection layout, streams must be upstream of a confluence with Type F/SSBT and have continuous flowing water without a 250' break within the Area of Inquiry (see Stream Surveys section later in this chapter). Therefore, any perennial stream segments directly flowing into a Large or Medium Type N or above a 250' break in flow would receive only an ELZ.

In eastern Oregon, Type Ns streams that flow directly into Type F or Type SSBT streams receive an R-ELZ for 750 feet upstream of the confluence.

For additional information on ELZs during harvesting activities, refer to the Harvesting chapter and ODF's Forest Practices Technical Guidance on ELZs, available at oregon.gov/odf/working/pages/fpa.aspx.



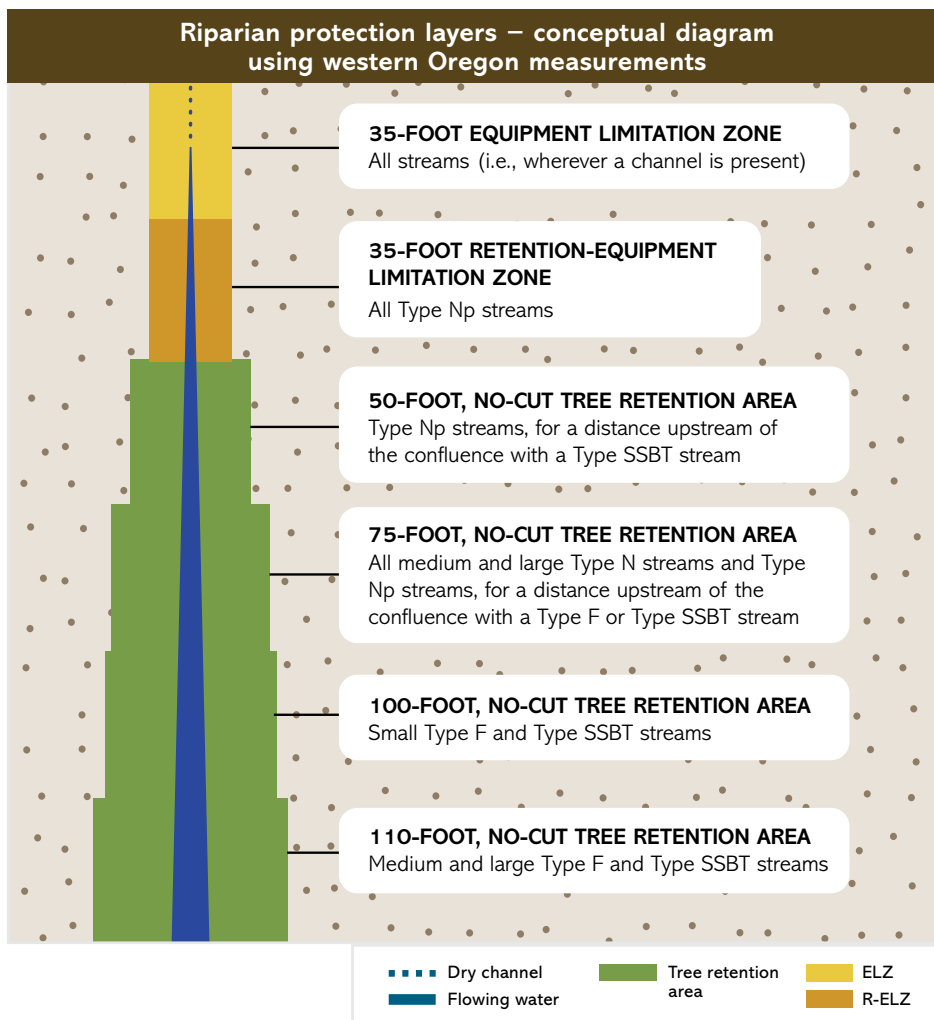
* Operators must take corrective action(s) when soil disturbance from ground-based equipment exceeds 10%, or cable-based equipment exceeds 20% of the total area within any ELZ or R-ELZ within a logging operation unit. (OAR 629-630-0700, 629-630-0800)

Understanding the terminology used for Oregon's riparian area protections

You may hear people use the term “buffers” when referring to riparian protections in Oregon. By definition, a buffer is an area that serves as a protective barrier. In this case, a buffer protects riparian zones from disturbances caused by forestry activity that can alter important riparian area characteristics, such as water quality or temperature.

The Oregon Forest Practices Act refers to such riparian protections as riparian management areas (RMAs). Prior to 2023, many people thought of riparian buffers only as retaining standing trees near streams. However, many other types of required buffers are applicable to riparian areas during timber harvest unit planning and layout, site preparation, herbicide application, logging equipment use near streams and on steep slopes, and more. In 2023, additional types of buffers were added to the Forest Practices Act rules, including equipment limitation zones (ELZs); slope retention areas and designated debris flow traversal areas for logging on steep slopes; and expanded tree retention areas along streams.

This section of the *Illustrated Manual* addresses how to determine and lay out tree retention areas and equipment limitation zones in RMAs. To avoid confusion and accurately communicate riparian protections in Oregon, we will specify the type of protection (e.g., tree retention area or ELZ) rather than using generic terms such as “RMA” or “buffer.”



It is helpful to think of stream protections as additive layers that, when drawn together, appear somewhat like a tiered cake.

The base layer of protection on every stream is an equipment limitation zone (ELZ) where disturbance must be minimized. Layers are added as the size of the stream increases, and with the presence of fish and certain species of fish.

After the base ELZ, retention-ELZs (R-ELZs) are added for all Type Np streams. This is followed by tree retention areas of limited length for non-fish perennial streams flowing into fish (F) or salmon, steelhead or bull trout (SSBT) types, and then tree retention areas for the full length of medium and large non-fish and domestic streams, and all Type F and SSBT streams.

Note: This diagram uses westside, standard practice measurements, but the concept of protection layering applies to all landowner sizes and in eastern Oregon.

RMA widths differ

Depending on:

- geographic region (eastern or western Oregon) where the stream is located
- stream type and size
- what type of stream a Type Np stream flows into and proximity to the confluence
- size of the lake
- kind and size of the wetland
- landowner type (large or small forestland owner) and protection option chosen

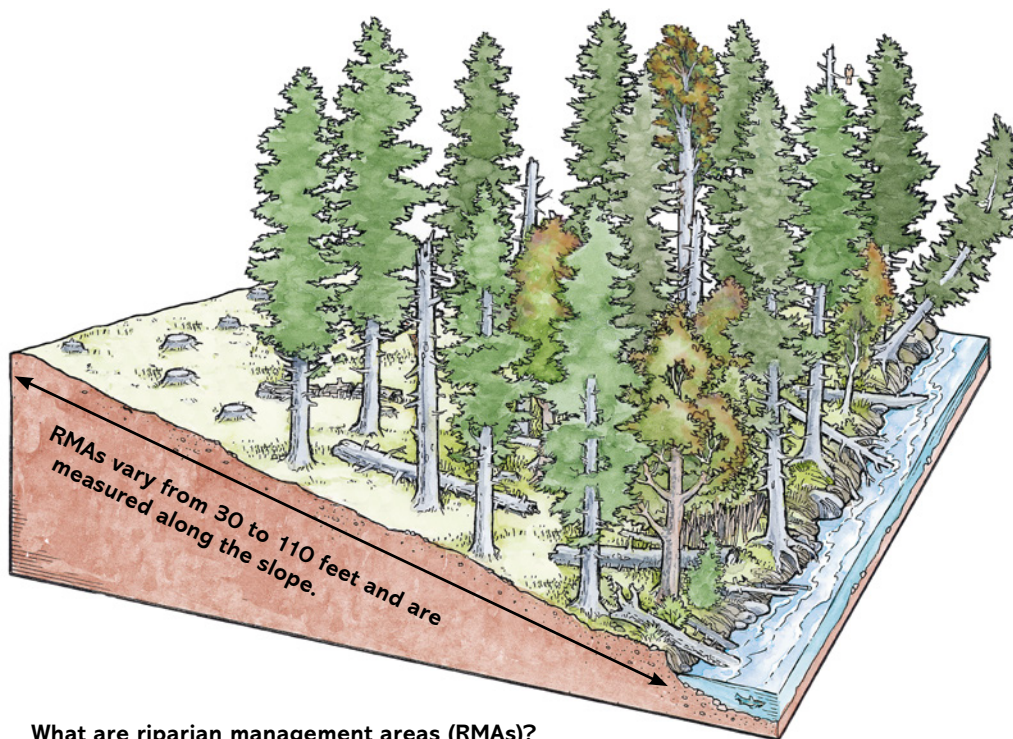
Note: When there are two water features adjacent to or connected to one another, use the RMA width required for the more dominant water feature.

RMAs are required around all streams and most other water bodies

Either tree retention areas or ELZs are required for lakes, stream-associated wetlands, significant wetlands, and all stream types and sizes. Apart from those associated with streams, no RMA is required for seeps, springs or other wetlands smaller than one-quarter acre.

STREAM PROTECTION DESIGN AND LAYOUT IN TIMBER HARVEST AREAS

Once you have decided to conduct forest practice activities that involve cutting trees, and have determined the timber harvest type and size (refer to the Planning chapter for details on harvest types), it is time to identify the water features that require protection within the harvest area. This section will help you plan for and meet the water protection requirements while harvesting timber along waterways. This is a complicated part of the Oregon Forest Practices Act, but it is intended to allow for flexibility to accommodate different scenarios. To lay out the stream protection measures you will be required to follow under Oregon law, read through this entire section, noting the specific rules for the region where your forested property is located, the size of that property, and protection options based on whether you are a small or large forest landowner.



What are riparian management areas (RMAs)?

RMAs are found along the edges of streams, lakes, reservoirs, springs, marshes, bogs, ponds and seeps.

To help protect these water bodies, RMAs are locally specified and have requirements for retaining trees, snags and understory vegetation, and for limited or modified practices.

Understanding end of perennality

"End of perennality" (EOP), also known as the "uppermost point of perennality," or "uppermost flow feature extent" (FFE) when surveying, is not separately defined in the Forest Practices Act rules. But it refers to a significant point on the ground, which is used to delineate between riparian protections. Anything downstream of this point in the stream must receive perennial non-fish (Type Np) protection, while anything upstream must be protected as a seasonal non-fish (Type Ns) stream. The term "end of perennality," or EOP, is used in this manual as a succinct way of referring to the modeled, verified or operational field-surveyed EOP.

Note that the presence of flowing water at the time of the timber harvest unit layout is not necessarily used to define riparian protections, because water flow changes over the course of the year — especially for seasonal streams. For more information on determining EOP, refer to the stream surveys sections on page 98.

STEPS FOR LAYOUT OF RIPARIAN AREAS

1. First, look at the known water features within, adjacent to, and beyond your timber harvest unit. Locate streams, wetlands, lakes, bogs, estuaries, seeps and springs. Because some stream protections are applied based on what is upstream or downstream of stream segments within a harvest unit, you will need to include the bigger picture of the riparian system, including what is known about stream status off of your property if the streams you are protecting cross a boundary line.

This is both a field and office exercise, utilizing a map of the proposed harvest area to traverse the ground to get a sense for what is there, and reviewing resource layers within the Oregon Department of Forestry's (ODF) forest practices mapping website and any other mapping software.

Riparian area protections are the focus of this section, but in some cases, protections for one subject area interact with protections for another. Here are some examples:

- > If sensitive wildlife species are identified and/or leave trees are required based on harvest type and size, see the Wildlife chapter.
- > If the ODF map indicates steep or unstable slopes adjacent to or near streams, see the Steep Slopes chapter.
- > If you plan to build or maintain roads or temporary stream crossings in conjunction with the harvest, see the Roads and Water Crossings chapter.
- > If your harvest unit contains or is adjacent to a wetland, see page 89.

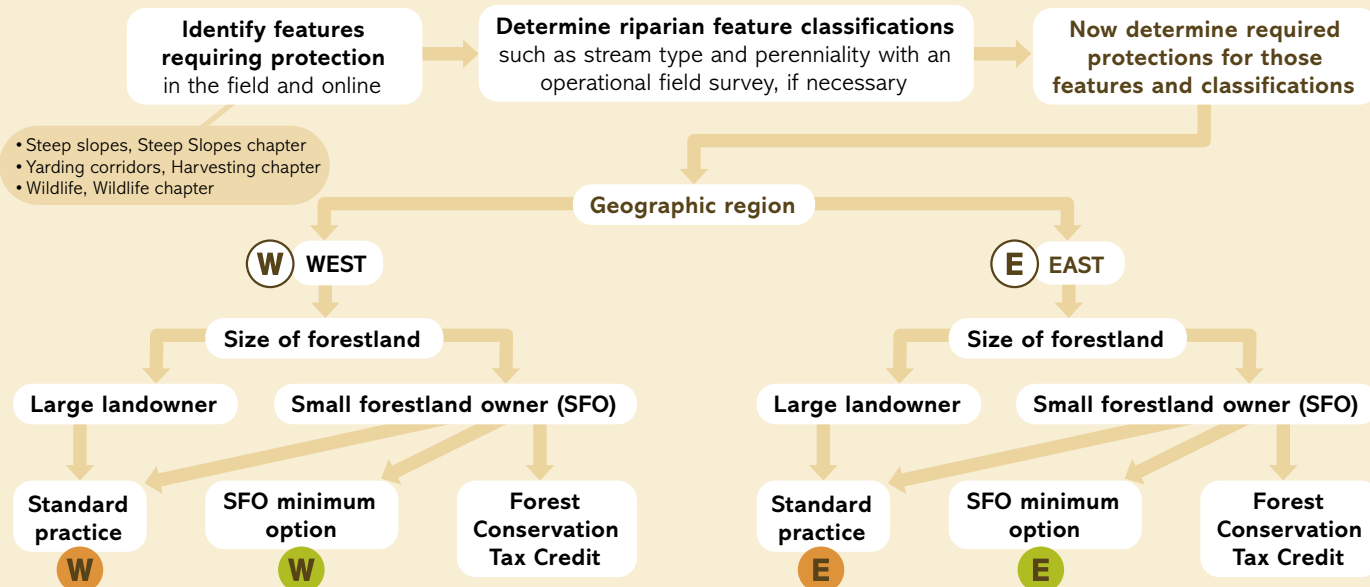
> If your harvest unit is near a lake, see page 87.

2. Once you've identified that your harvest area contains or is adjacent to water, you will need to determine how the water body is classified and which stream types, seasonality and end points are present. If you haven't already, review the section on water classification and protection on page 56.
3. If necessary or desired, conduct a survey to verify fish-use, stream end and seasonality. For more information on when and how to survey streams, see the stream surveys section on page 98. Once the modeled end of perennality is available from ODF, you are not required to conduct a stream survey and can utilize the modeled information. Until that time, in the absence of a survey, assume the full length of the stream or other water body is perennial and apply the maximum protection required for those waters.
4. From this point, the region where your forested property is located, how much forestland you own, and whether you decide to use one of the alternative options for qualified small forestland owners (SFOs) will determine how you design your riparian protection area(s). The decision tree below will direct you to the section that applies to you based on these factors.

Look for these icons for specific information regarding your situation:

- | | |
|---------------------------|---|
| (W) western Oregon | (W) western Oregon, standard practice |
| | (W) western Oregon, SFO minimum option |
| (E) eastern Oregon | (E) eastern Oregon, standard practice |
| | (E) eastern Oregon, SFO minimum option |

Riparian protection layout flow chart



Both regions and forestland sizes: In some situations, you may use alternative vegetation retention prescriptions (see page 94) or site-specific vegetation retention prescriptions (see page 96).

W Western Oregon, standard practice

All large forest landowners with property west of the Cascade Range must follow the standard practice for water protection. SFOs may also voluntarily choose to follow the standard practice to qualify for a tax credit. Some small landowners may be required to follow the standard practice due to the fifth field watershed restriction (see page 65). The western Oregon standard practice requires fixed-width tree retention areas (no-cut buffers) along each side of Type F, Type SSBT, Type D, and large and medium Type N streams. Tree retention areas along Type F and Type SSBT streams are the same width. Small Type N streams require equipment limitation zones (ELZs) for Type Ns and retention-equipment limitation zones (R-ELZs) for Type Np. A tree retention area is required for a set distance

Stream type	Large	Medium	Small	Upstream distance
Type F or Type SSBT	110 ft.	110 ft.	100 ft.	N/A
Type N	75 ft.	75 ft.	See Type Np	N/A
Type Np, into Type SSBT			75 ft. and 50 ft.	75 ft. for 500 ft., then 50 ft. for 650 ft. RH Max = 1,150 ft.
Type Np, into Type F			75 ft.	RH Max = 600 ft.
Type D	75 ft.	75 ft.	75 ft. or 20 ft.*	See OAR 629-643-0150

* 20 feet outside of Type Np vegetation retention requirements

from the confluence along a Type Np that flows into Type F or Type SSBT streams.

E Eastern Oregon, standard practice

All large forest landowners with property east of the Cascades must follow the standard practice for water protection. SFOs may also voluntarily choose to follow the standard practice to qualify for a tax credit. Some small landowners may be required to follow the standard practice due to the fifth field watershed restriction (see page 65). Eastern Oregon has two zones within a streamside RMA. The inner zone is a fixed-width tree retention area (no-cut buffer) of 30 feet for all stream sizes and types where tree retention is required. The outer zone, which varies from 20 feet to 70 feet in width, depending on stream size, can be managed actively, and trees removed for harvest, with a written plan. The outer zone has disturbance limits in the form of an equipment limitation zone (ELZ) and a minimum of 60 square feet of basal area of well-distributed trees that must be retained. To meet the basal area minimum, 27 trees from the largest diameter class per acre must be retained. The remainder of the trees retained to reach 60 square feet of basal area must be greater than eight inches in diameter at breast height. When present, fire-resilient trees, including ponderosa pine, Douglas-fir, western larch and hardwoods, should be left. Generally, leave a distribution of different species and sizes of trees to promote fire resiliency and overall forest stand health. ELZs are required for Type Ns streams, and retention-equipment limitation zones (R-ELZs) are required for Type Np streams. Type Np streams are designated as terminal or lateral. Along terminal Type Np streams that flow into a Type

F or Type SSBT stream, a 30-foot-wide tree retention area inner zone and a 30-foot-wide outer zone are required for 500 feet upstream of the confluence with the Type F or Type SSBT stream. Along a lateral Type Np stream, a 30-foot-wide inner zone (no outer zone) is required for 250 feet upstream of the confluence with a Type F or Type SSBT stream. Along Type Ns streams that flow into a Type F or Type SSBT stream, a 30-foot-wide R-ELZ must be maintained for 750 feet upstream from the confluence with the Type F or Type SSBT stream.

Stream type	Large		Medium		Small		Upstream distance ¹
	Inner	Outer ²	Inner	Outer ²	Inner	Outer ²	
Type F or Type SSBT	30 ft.	70 ft.	30 ft.	70 ft.	30 ft.	45 ft.	-
Type N	30 ft.	45 ft.	30 ft.	45 ft.	-	-	-
Type Np, Terminal					30 ft.	30 ft.	RH Max = 500 ft.
Type Np, Lateral					30 ft.	N/A	RH Max = 250 ft.
Type D	30 ft.	-	30 ft.	-	30 ft. or 20 ft. ³	-	See OAR 629-643-0150

1. Upstream distance from either Type F or Type SSBT

2. Outer zone shall retain 60 square feet of basal area per acre; apply OAR 629-643-0120

3. 20 feet outside of Type Np vegetation retention requirements

Large landowners may skip to page 68 to continue the riparian protection layout process.

Small forestland owner (SFO)

SFOs can choose one of three protection options when harvesting timber. (For more details on who qualifies as an SFO, see the Introduction chapter.)

1. **Standard practice:** Voluntarily follow the standard practice used by large landowners when harvesting timber around riparian management areas (RMAs).
2. **SFO minimum option:** Manage according to alternative minimum rules defined in a special section of the Oregon Forest Practices Act. These are roughly equivalent to RMA widths prior to January 1, 2024. Use of the SFO minimum option is limited to 5% of the horizontal lineal feet of those types of streams owned by SFOs over a five-year rolling average, per the defined fifth field watershed. The SFO minimum option is not available along Type D streams.
3. **Forest Conservation Tax Credit (FCTC):** Follow the standard practice used by large forest landowners and claim a tax credit for some of the timber value of the area committed to conservation. This option was established to incentivize SFOs to adopt standard practice prescriptions. When taking this option, the SFO becomes eligible for a tax credit equal to the stumpage value of the additional timber retained in a forest conservation area by adopting the standard practice, in excess of what would be retained in the SFO minimum option. The FCTC is not available along Type D streams or for Type 4 harvests.

CHOOSING AN OPTION

Implications of choosing one option over another will be unique to each landowner and harvest situation. For a side-by-side comparison table of RMA requirements by option, see Table 3-5 (page 68) for westside and Table 3-6 (page 69) for eastside. SFOs may find it useful to lay the standard practice and minimum option out simultaneously, so that the financial, visual and practical implications of each option are easier to understand. Gathering the required stumpage valuation for the tax credit can be done simultaneously with this layout, or it may be simpler to wait until layout is complete; both marked lines are needed to establish the FCTC area. If both options are laid out before a decision is made, taking the SFO minimum option would mean removing the outer line of ribbon before harvest operations begin. Note that the costs of layout and appraisal are included in the tax credit but cannot be recovered for the standard practice or SFO minimum option.

When laying the standard and minimum options out together, the trees between the two ribbon lines represent the potential FCTC area. (It may be helpful to use two different colors of ribbon.) You can remove the outer ribbons representing the standard option before harvest if you decide to take the SFO minimum option.

Indicate which option you are electing when notifying the Oregon Department of Forestry (ODF) of a timber harvest operation, at least 15 days prior to the expected start date of the operation. Note that ODF can be notified of plans for a harvest operation using the SFO minimum option, and you can decide at the time of harvest to take the standard option and tax credit, but not the reverse.

SFO minimum option

The SFO minimum option is available to landowners who qualify as small forestland owners under specific criteria outlined in the OFPA, and who prefer to harvest more trees in certain riparian areas. There is a minimum option for harvest Types 1, 2 and 3, but not Type 4. It allows the use of narrower tree retention area widths than the standard option.

Landowners must indicate that they are taking the SFO minimum option on the Notification of Operation they submit to ODF and certify that they meet the definition of a small forestland owner. The Notification of Operation and written plan required for harvest operations near a stream (see the Planning chapter for information on written plans) must also include:

1. classification of the stream(s)
2. horizontal lineal feet of riparian area adjacent to, or inside, the operation area
3. whether riparian measurements are for one or both sides of the RMA

Upon completion of harvest operations, actual lineal feet of riparian area harvested must be reported to the state within 90 days to update the use of the SFO minimum option from “proposed” to “actual.”

ROLLING FIVE-YEAR CAP ON SFO MINIMUM OPTION USE BY WATERSHED

Use of the minimum option is restricted to 5% of the lineal stream feet (horizontal distance, both sides) per stream classification, within a fifth field watershed, over five years. The “5-5-5 rule” is an easy way to refer to and remember this. ODF must notify the landowner within 15 days of the submission of a Notification of Operation if the minimum option is not available in the current tax year. If the SFO is unable to take the minimum option, they can either enter a waiting list for when the option becomes available, or use the standard practice and become eligible for 125% of the stumpage value of the forest conservation area, if taking the FCTC option.

W WESTERN OREGON SFO MINIMUM OPTION

In western Oregon, the SFO minimum option is approximately equal to the RMA widths required for all landowners prior to July 1, 2023, with additional protections for small Type N streams. Fixed-width tree retention areas under the minimum option are applied around Type F, Type SSBT, Type D, and large and medium Type N streams. Small Type N streams require ELZs for Type Ns and R-ELZs for Type Np. Along Type Np streams that flow into Type F streams or Type SSBT streams, a 35-foot-wide tree retention area is required for a set distance from the confluence with the Type F or Type SSBT stream.

Table 3-3 Western Oregon SFO minimum option distances for vegetation retention in RMAs

Stream type	Large	Medium	Small	Upstream distance ¹
Type SSBT	100 ft.	80 ft.	60 ft.	N/A
Type F	100 ft.	70 ft.	50 ft.	N/A
Type N	70 ft.	50 ft.	See Type Np	
Type Np, into Type SSBT			35 ft.	RH Max = 1,150 ft.
Type Np, into Type F			35 ft.	RH Max = 600 ft.
Type D	75 ft.	75 ft.	35 ft. or 20 ft. ²	See OAR 629-643-0150

1. Upstream distance from either Type F or Type SSBT

2. 20 feet outside of Type Np vegetation retention requirements

E EASTERN OREGON SFO MINIMUM OPTION

In eastern Oregon, the width of the inner zone of the no-cut tree retention area for the SFO minimum option is 30 feet, the same as the standard practice. The difference between the standard option and the SFO minimum option is in the managed outer zone width.



Forest Conservation Tax Credit (FCTC)

The FCTC provides SFOs a financial incentive for retaining larger unharvested areas next to streams. SFOs who agree to limit timber harvests in the forest conservation area for 50 years by following the standard practice for harvests (rather than the SFO minimum option) can receive a tax credit based on the value of the unharvested timber inside the conservation area and related costs.

The width of the area that may be eligible for the tax credit (called the forest conservation area) is the distance between the outermost edge of the standard practice width and the outermost edge of the SFO minimum option width (outer zone only in eastern Oregon). The tax credit area extends for the length of the tree retention area adjacent to or within the harvest unit.

Forest Conservation Tax Credit (FCTC)

(continued)

W WESTERN OREGON

In western Oregon, for all stream types except for small Type N streams, the length of the FCTC area is the length of frontage of the timber harvest unit on that stream type segment. For small Type Np streams, the length of the tax credit area follows the same lengths as the standard practice option, where tree retention areas are required on tributaries to Type F and Type SSBT streams. There is no FCTC for small Type Ns streams, because no additional tree retention is required in these areas. An additional FCTC area is located along dry channels of Type Np streams. See page 83 and OAR 629-607-0450(2) for more detailed information.

E EASTERN OREGON

In eastern Oregon, only five stream types are eligible for the FCTC option: medium and small Type F and Type SSBT streams, and medium Type N streams. For these five stream types, the length of the FCTC area is the length of frontage of the harvest unit on that stream type segment. Within the FCTC area, only the timber that exceeds the required minimum 60 square feet of basal area per acre can be included toward the tax credit amount.

Table 3-4 Eastern Oregon SFO minimum option distances for vegetation retention in RMAss

Stream type	Large		Medium		Small		Upstream distance ¹
	Inner	Outer	Inner	Outer	Inner	Outer ²	
Type F or Type SSBT	30 ft.	70 ft.	30 ft.	50 ft.	30 ft.	30 ft.	N/A
Type N	30 ft.	45 ft.	30 ft.	30 ft.	-	-	-
Type Np, Terminal					20 ft.	20 ft.	RH Max = 500 ft.
Type Np, Lateral					20 ft.	N/A	250 ft.
Type D	30 ft.	-	30 ft.	-	20 ft.	-	See OAR 629-643-0150

1. Upstream distance from either Type F or Type SSBT

2. Outer Zone shall retain 60 square feet of basal area per acre; apply OAR 629-643-0120

The timber in the forest conservation area needs to be valued according to a specific process (see OAR 629-607-0500). Applicable stumpage values can be calculated using one of these methods:

- **Conversion return:** Determine volume of retained timber by species and log grades. A value is established from current delivered log price information – less a reasonable cost for harvest and delivery – for the area in which the retained timber would ordinarily be sold.
- **Actual comparison:** May be used when the timber being retained is similar in species and log grades to the timber being harvested. Calculate using actual revenues in the harvest area adjacent to the forest conservation area.
- **Cash flow modeling:** Determine the value of standing timber by using the projected volume of the stand over a harvest rotation based on species and site class. Figure the value at harvest age and discount it using the interest rate set by the USDA Farm Service Agency for a direct farm ownership loan.

Costs (for appraisal and for filing and recording deed restriction) may be included in the credit amount only to the extent that those costs are not claimed as an income tax deduction by the taxpayer. It may be necessary to hire a professional forester to perform this appraisal; however, the costs incurred for the appraisal can be added to the value of the tax credit. The tax credit amount is the appraised value of the timber in the FCTC area plus appraisal and deed restriction filing costs.

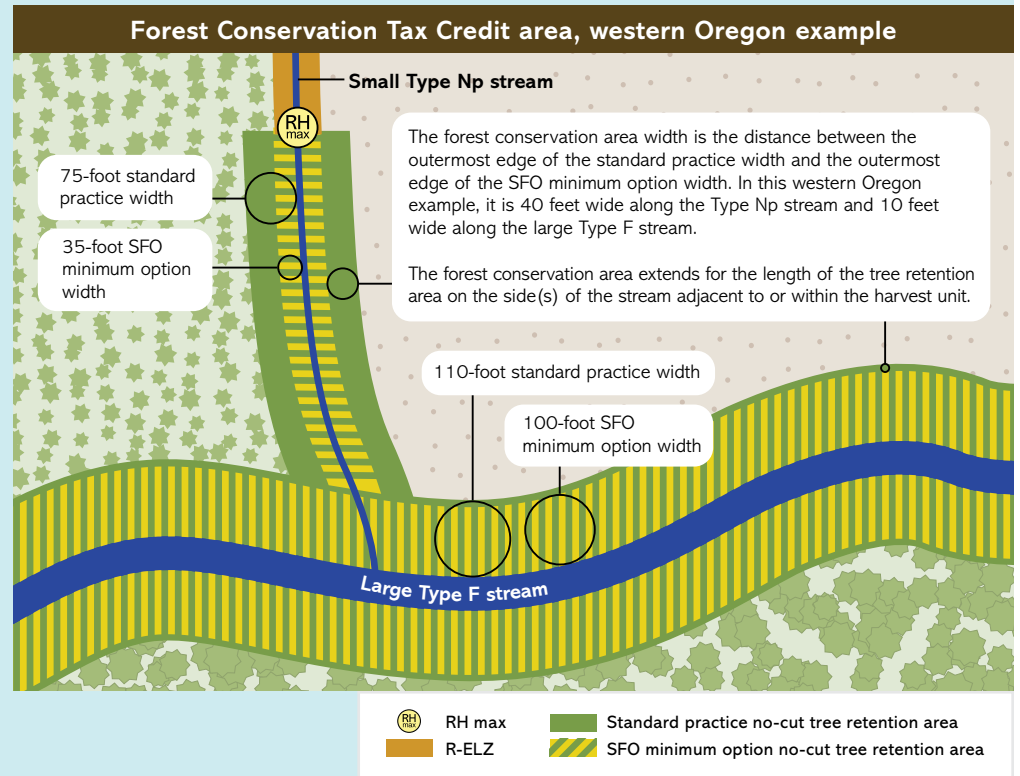
Tax credit uses:

- offset Oregon income or estate tax liability
- lump sum or over multiple consecutive or non-consecutive tax years
- transfer to heirs

Note: The tax credit is not transferable to a new landowner if the land is sold.

Once the credit is issued, the standard practice must be used in the RMA for 50 years from the date of notification. During that time, trees cannot be removed unless for public safety, incidental removal, or personal use. Consult with an ODF stewardship forester if you are considering removing any trees from the forest conservation area.

Specific details of the FCTC, including eligibility, stumpage value certification, transfer to heirs, deed restriction and appeals, are found in OAR 629-607-0400 to 0800.



To qualify for the FCTC, you must:

- be a small forestland owner
- plan to do a Type 1, 2 or 3 timber harvest (harvest Type 4, thinning, is excluded)
- harvest an area equal to or larger than the area you elect not to harvest
- agree to follow standard practice harvest rules
- indicate intent to apply for the tax credit
- submit required information and documentation to ODF within three months of harvest completion
- retain the conservation area for 50 years

Options for SFOs with significant disproportionate impacts

If an SFO's property qualifies as significantly disproportionately impacted by the updated Forest Practices Act rules, there are a few options that provide some financial relief.

"Significantly disproportionately impacted" applies to an SFO's parcel that:

- has a dwelling and is 10 acres or more
- has a total encumbrance from all small forestland minimum option RMAs, as described in OAR 629-643-0140, greater than 20% of the forested acreage of the parcel
- generates timber revenue that is required to sustain management activities on forest properties,

cover annual costs of ownership, provide regular contributions to income, or contribute more than 5% of the revenue to a planned estate investment, as demonstrated by a forest management plan

If these criteria are met, the SFO can be exempted from the watershed cap (5-5-5 rule) and count all trees retained in RMAs towards the wildlife leave tree retention requirements, per OAR 629-607-0100(3).

Additionally, if the impacted SFO meets income limits based on federal adjusted income — not more than 125% of Oregon's median household income, averaged over the three previous tax years — the stumpage value in the FCTC area can be multiplied by 125%.

W Table 3-5 Western Oregon stream RMA matrix

Stream type	W Standard practice width	W SFO minimum option width	SFO FCTC option credit width
Large Type SSBT	110 ft.	100 ft.	Area between 100 ft. and 110 ft.
Medium Type SSBT	110 ft.	80 ft.	Area between 80 ft. and 110 ft.
Small Type SSBT	100 ft.	60 ft.	Area between 60 ft. and 100 ft.
Large Type F	110 ft.	100 ft.	Area between 100 ft. and 110 ft.
Medium Type F	110 ft.	70 ft.	Area between 70 ft. and 110 ft.
Small Type F	100 ft.	50 ft.	Area between 50 ft. and 100 ft.
Large Type N	75 ft.	70 ft.	Area between 70 ft. and 75 ft.
Medium Type N	75 ft.	50 ft.	Area between 50 ft. and 75 ft.
Small Type Np that flows into Type SSBT	Upstream retention distance is the shorter of the RH Max or the uppermost flow feature (per protocol). RMA width = 75 ft. on first 500 ft. of stream length, then 50 ft. on the next 650 ft. . Total RH Max from confluence with SSBT is 1,150 ft. .	Upstream retention is the shorter of the RH Max or uppermost flow feature. RMA width = 35 ft. and the total RH Max is 1,150 ft. from confluence with the Type SSBT stream.	Width = Area between 35 ft. and the outside edge of the standard practice (50 ft. or 75 ft.) Length = Same as standard practice
	The tree retention areas and 35 ft. R-ELZ and ELZ apply to each side of the stream as follows: 1. R-ELZs are to extend from end of RH Max, upstream to the identified uppermost flow feature. The end of the tree retention area is squared off at the end of the tree retention area (RH Max) in this case. 2. If the uppermost flow feature is determined to be within the RH Max for the stream, the ELZ shall extend upstream to the end of the stream channel and end of tree retention area will extend as a radius around the uppermost flow feature.		
Small Type Np that flows into Type F	Upstream retention distance is the shorter of the RH Max or the uppermost flow feature (per protocol). RMA width = 75 ft. and total RH Max is 600 ft. from the confluence with the Type F stream.	Upstream retention is the shorter of the RH Max or uppermost flow feature. RMA width = 35 ft. and the total RH Max is 600 ft. from confluence with the Type F stream.	Width = Area between 35 ft. and the outside edge of the standard practice (75 ft.) Length = Same as standard option
	The tree retention areas and 35 ft. R-ELZ and ELZ apply to each side of the stream as follows: 1. R-ELZs are to extend from end of RH Max, upstream to the identified uppermost flow feature. The end of tree retention area is squared off at the end of the tree retention area (RH Max) in this case. 2. If the uppermost flow feature is determined to be within the RH Max for the stream, the ELZ shall extend upstream to the end of the stream channel, and end of tree retention area will extend as a radius around the uppermost flow feature.		
Small Type Ns	35 ft. ELZ	35 ft. ELZ	None

Flow feature – flowing water for 25 continuous feet or more.

RH Max – The maximum tree retention distance described for any particular small Type Np stream that flows into a Type F or SSBT stream.

ELZ – Equipment limitation zone. Minimize soil disturbance. Take corrective action to restore lost function if soil disturbance is >10% ground-based equipment, >20% cable yarding.

R-ELZ – Retention-equipment limitation zone. Retain trees <6 inches diameter at breast height (DBH) and shrubs where possible. Minimize soil disturbance. Take corrective actions to restore lost function if soil disturbance is >10% ground-based equipment, >20% cable yarding.

SFO – Small forestland owner of less than 5,000 acres of forest who harvested less than 2 million board feet a year on average for the last three years and plans to harvest on average that amount for the next 10 years, qualifying for the SFO minimum option.

SFO FCTC option – Forest Conservation Tax Credit available to SFOs who choose to follow the standard practice RMA widths and claim a tax credit for the value of timber left standing in the strip of forestland between the standard option RMA width and SFO minimum option RMA width.

Note: Widths are measured as slope distance from the edge of the active channel, or channel migration zone if present.

E Table 3-6 Eastern Oregon stream RMA matrix

Stream type	E Standard practice width		E SFO minimum option width		SFO FCTC option credit width
	Inner	Outer	Inner	Outer	
Large Type F or SSBT	30 ft.	70 ft.	30 ft.	70 ft.	N/A
Medium Type F or SSBT	30 ft.	70 ft.	30 ft.	50 ft.	Area between 80 ft. and 100 ft.
Small Type F or SSBT	30 ft.	45 ft.	30 ft.	30 ft.	Area between 60 ft. and 75 ft.
Large Type N	30 ft.	45 ft.	30 ft.	45 ft.	N/A
Medium Type N	30 ft.	45 ft.	30 ft.	30 ft.	Area between 60 ft. and 75 ft.
ELZ or R-ELZ		30 ft.	ELZ of 30 ft. apply to all outer zones where applicable		
Small Type Np terminal that flows into Type F or SSBT	30 ft.	30 ft.	20 ft.	20 ft.	Width = Area between 40 ft. total RMA and the outside edge of the standard practice 60 ft. total RMA Length = Same as standard practice
	Upstream retention distance is the shorter of the RH Max or the uppermost flow feature (per protocol). RMA width = 30 ft. inner zone and 30 ft. outer zone for 500 ft. of stream length. Total RH Max from confluence with Type F or SSBT stream is 500 ft.		Upstream retention distance is the shorter of the RH Max or uppermost flow feature. RMA width = 20 ft. inner zone and 20 ft. outer zone. Total RH Max from confluence with Type F or SSBT stream is 500 ft.		
	The tree retention areas and 30 ft. R-ELZ and ELZ apply to each side of the stream as follows: <ol style="list-style-type: none">1. The ELZs apply to the outer edge of the inner zone and extend out 30 ft.. R-ELZs are to extend upstream to the identified most uppermost flow feature. The end of the tree retention area is squared off at the end of the RH Max in this case.2. If the uppermost flow feature is determined to be within the RH Max for the stream, the ELZ shall extend upstream to the end of the stream channel, and tree retention area will extend as a radius around the uppermost flow feature.				
Small Type Np lateral that flows into Type F or SSBT	30 ft.	0 ft.	20 ft.	0 ft.	Width = Area between 20 ft. total RMA and the outside edge of the standard practice 30 ft. total RMA Length = Same as standard practice
	Upstream retention distance is the shorter of the RH Max or the uppermost flow feature (per protocol). RMA width = 30 ft. inner zone with no outer zone. Total RH Max is 250 ft. from the confluence with the Type F or SSBT stream.		Upstream retention distance is the shorter of the RH Max or uppermost flow feature. RMA width = 20 ft. inner zone with no outer zone. Total RH Max is 250 ft. from confluence with the Type F or SSBT stream.		
	The tree retention areas and a 30 ft. R-ELZ and/or ELZ apply to each side of the stream as follows: <ol style="list-style-type: none">1. R-ELZs are to extend from end of RH Max, upstream to the identified uppermost flow feature. The end of the tree retention area is squared off at the end of the RH Max in this case.2. If the uppermost flow feature is determined to be within the RH Max for the stream, the ELZ shall extend upstream to the end of the stream channel, and end of tree retention area will extend as a radius around the uppermost flow feature.				
Small Type Ns that flows into Type F or SSBT	30 ft. R-ELZ extending 750 ft. upstream from confluence. ELZ applies on remainder of channel.		30 ft. R-ELZ extending 750 ft. upstream from confluence. ELZ applies on remainder of channel.		N/A
Small Type Ns	30 ft. ELZ from edge of inner zone extending out.		30 ft. ELZ from edge of inner zone extending out.		N/A

Flow feature – flowing water for 25 continuous feet or more.

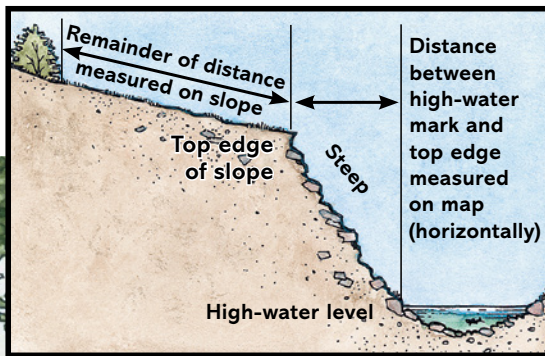
RH Max – The maximum tree retention distance described for any particular small Type Np Stream that flows into a Type F or SSBT stream.

ELZ – Equipment limitation zone. Minimize soil disturbance. Take corrective action to restore lost function if soil disturbance is >10% ground-based equipment, >20% cable yarding.

R-ELZ – Retention-equipment limitation zone. Retain trees <6 inches diameter at breast height (DBH) and shrubs where possible. Minimize soil disturbance. Take corrective actions to restore lost function if soil disturbance is >10% ground-based equipment or >20% cable yarding.

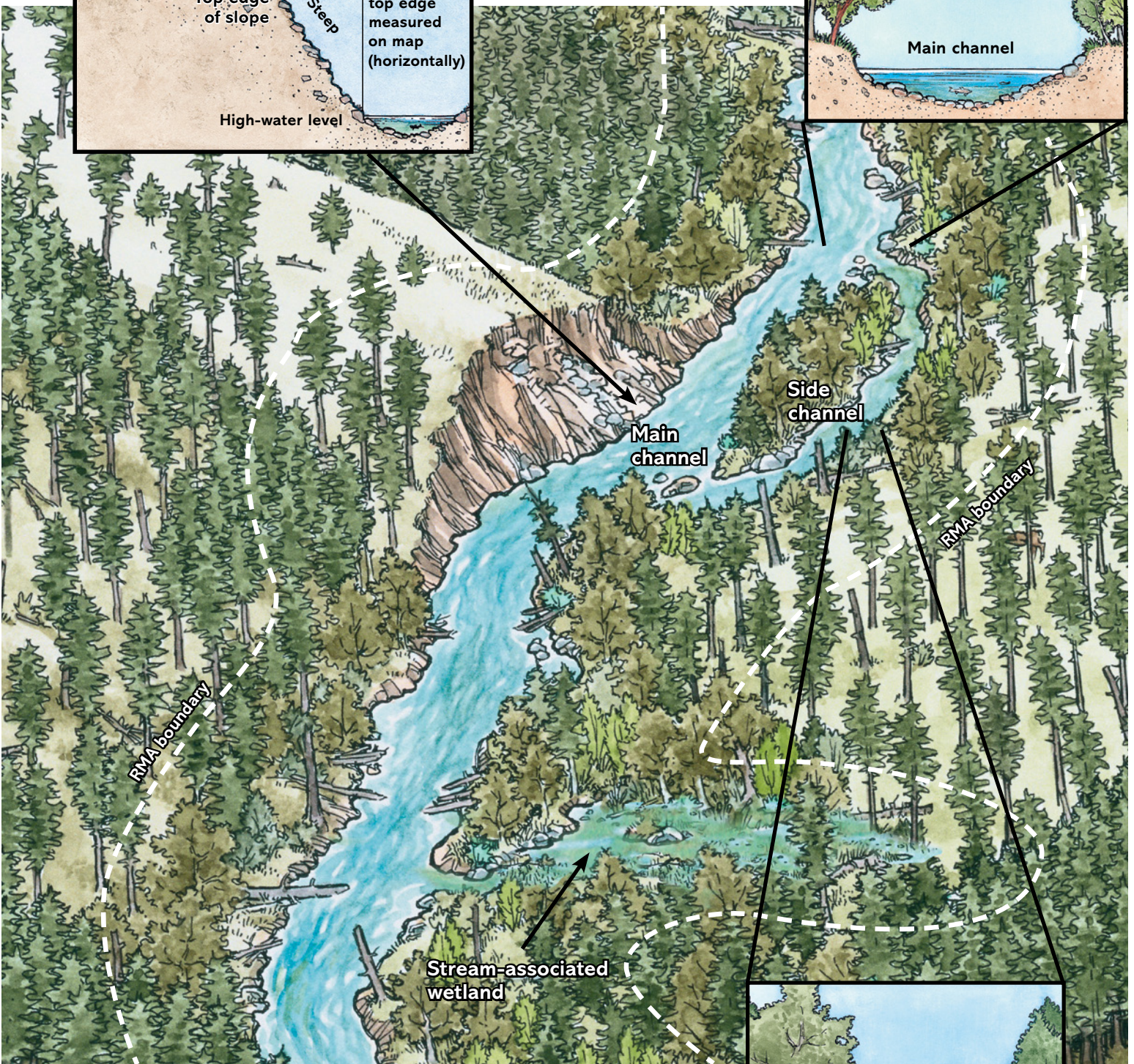
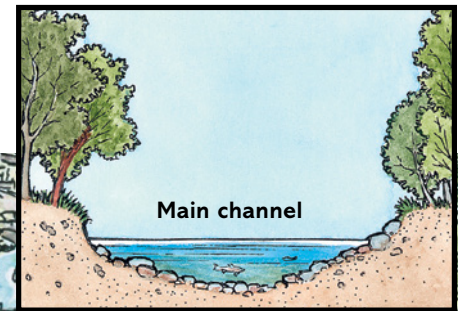
General guidelines for riparian protection layout

- The protections apply to all harvest types that include a riparian area.
- The rules outline minimum protections; there is always the option to leave more than is required.
- Written plans outlining resource protection measures are required for operations that require a notification, and that occur within 100 feet of:
 - > a Type F, Type SSBT or Type D stream
 - > a significant wetland (not an estuary) greater than eight acres, a bog, or an important spring in eastern Oregon, and within 300 feet of a significant wetland that is an estuary
- The width of the RMA is measured as slope distance from the edge of the active channel or channel migration zone. The active channel is the area between the high-water level of the average yearly flow (not the highest flood flow level), where trees and other year-round plants start growing. On many streams, it's the upper edge of the stream bank (see illustrations on next page and page 61).
- All measurements related to riparian protection layout are made on slope distance, except in the fifth field watershed rule for determining eligibility for the SFO minimum option based on use.
- Varying the width of tree retention areas is allowed to account for topography, operational requirements, vegetation, and fish and wildlife resources, but the average width of the entire length of the tree retention area must meet or exceed the required width. Averaging may not extend across stream segments of different size categories. Averaging may not be used for tree retention areas along lakes.
- The RMA boundary should be marked generally parallel to the stream with flagging, marking paint or signs, at intervals frequent enough to avoid confusion during logging.
- Marking of ELZs is less practical because most commercial trees are removed, and equipment may operate within them. At a minimum, the transition and end points where stream protections change should be communicated to the logging operator (preferably including a map that shows these points and all ELZs) and, if marked, designed to be highly visible during all stages of logging.
- Where steep exposed soil, a rock bluff, or talus (loose rock) slope occurs next to a stream, measure the RMA as a horizontal distance to the top of the exposed bank, bluff or talus slope. From there, measure the rest of the RMA as a slope distance.
- Where seeps and springs occur within vegetation retention areas (only the inner zone in eastern Oregon), retain all trees within 35 feet (standard practice) or 15 feet (SFO minimum option) of the seep or spring. This may necessitate extending or bumping out the tree retention area to a maximum of 35 or 15 feet if the seep or spring lies at the edge of the tree retention area. See page 90 for seep and spring protection details, and a diagram of this scenario. Locating required wildlife leave trees immediately adjacent to seeps and springs is encouraged.
- Where there is a stream-adjacent failure next to a Type F or Type SSBT stream on a slope that is greater than 70%, the width of the tree retention area may extend to the lesser of 170 feet, or where the slope breaks by 20% or more.
- Where side channels and stream-associated wetlands occur at the edge of (or extend beyond) a tree retention area, the tree retention area should be expanded to include the wetland or side channel, plus 25 additional feet. This includes where tree retention areas are required along small Type N streams.
- Where channel migration zones (CMZs) are present, the tree retention area width begins at the edge of the CMZ. See Forest Practices Technical Guidance (available at oregon.gov/odf/working/pages/fpa.aspx) for help identifying a CMZ.
- Alternative vegetation retention prescriptions are an option for forest areas experiencing stand-level mortality. See page 94.
- A site-specific vegetation retention prescription is an option that allows for changes to the vegetation retention requirements when restoring or enhancing RMAs or streams (see page 96).



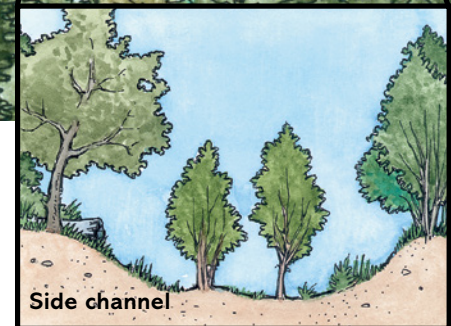
How to identify a main channel:

Most main channels have exposed river rock or bedrock, with very few plants growing in the channel.



How to identify a side channel:

Side channels only carry water when the main channel reaches a certain level. Exposed river rock may be less obvious, and terrestrial plants may grow in side channels. Side channels are separated from the main channel by an island (that can support terrestrial vegetation and is above the average bankfull elevation).



STREAM PROTECTION LAYOUT EXAMPLES AND PROCESS

The following examples and processes apply to all regions, landowners and protection options, unless otherwise specified.

Example 1

TYPE F, TYPE SSBT, TYPE D, AND LARGE AND MEDIUM TYPE N STREAMS

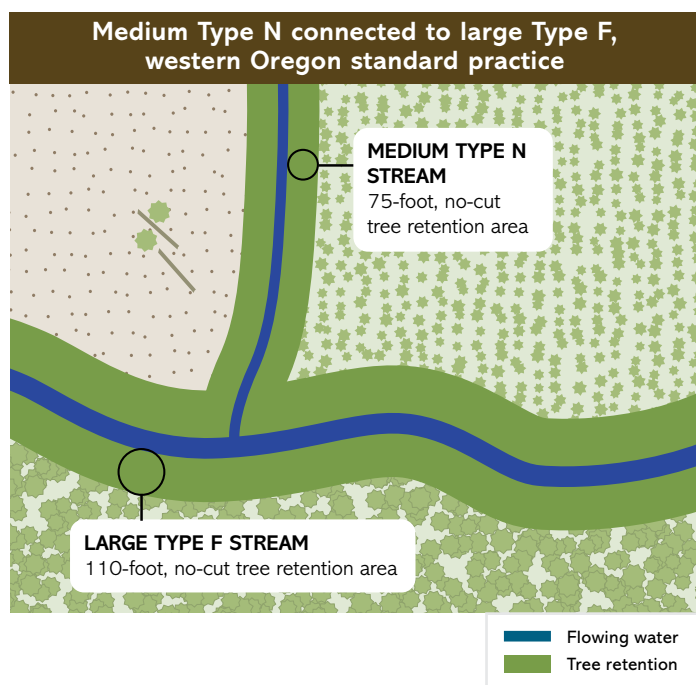
This is the most straightforward type of stream protection layout, because tree retention area widths are fixed for the length of the stream along the timber harvest, and are applied to all fish-bearing, medium and large non-fish-bearing, and domestic streams. The widths are measured from the edge of the active channel or the channel migration zone (CMZ), which is the area where the active channel is prone to move and could create a near-term loss of riparian function.

W WESTERN OREGON TREE RETENTION AREA WIDTHS

W Standard practice:

- Large and medium Type F and Type SSBT streams: 110 feet
- Small Type F and Type SSBT streams: 100 feet
- Large and medium Type N or Type D streams: 75 feet

See Table 3-1 on page 63.



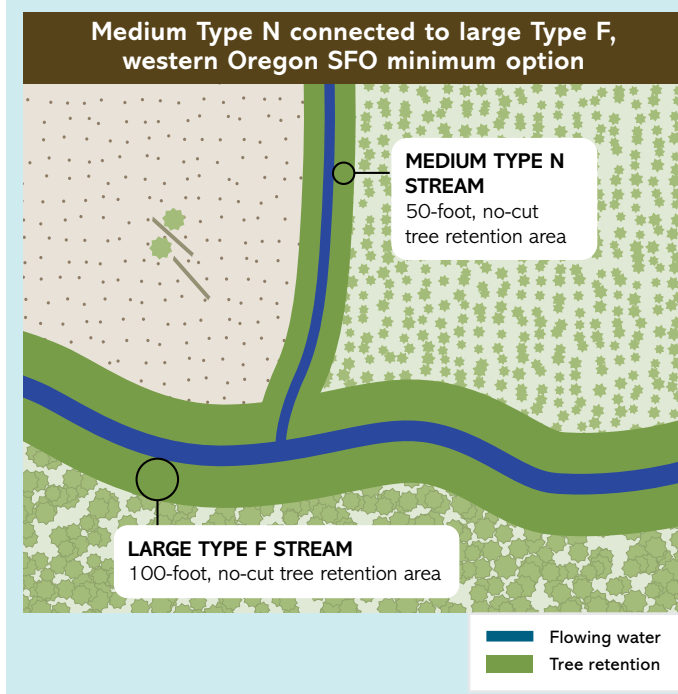
Look for these icons for specific information regarding your situation

- W** western Oregon
- W** western Oregon, standard practice
- W** western Oregon, SFO minimum option
- E** eastern Oregon
- E** eastern Oregon, standard practice
- E** eastern Oregon, SFO minimum option

W SFO minimum:

- Large Type F and Type SSBT streams: 100 feet
- Medium Type SSBT streams: 80 feet
- Medium and large Type D streams: 75 feet
- Medium Type F and large Type N streams: 70 feet
- Small Type SSBT streams: 60 feet
- Medium Type N and small Type F streams: 50 feet

See Table 3-3 on page 65.



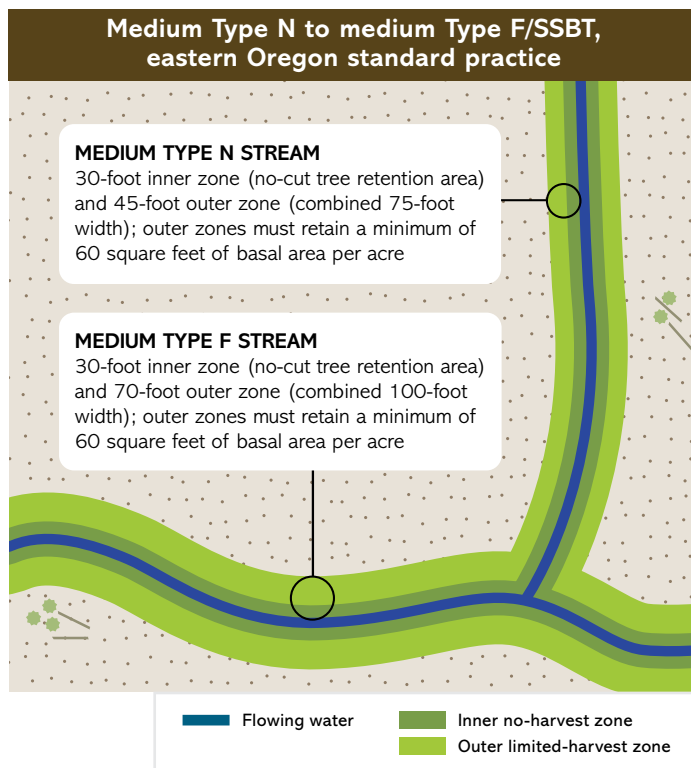
E EASTERN OREGON TREE RETENTION AREA WIDTHS

E Standard practice: For all stream sizes and types, an **inner zone** no-cut tree retention area width of 30 feet is required. For the **outer zone**, tree harvest is permitted with a written plan, but an equipment limitation zone (ELZ) must be adhered to and 60 square feet of basal area per acre must be retained in a way that facilitates stand health and fire resiliency (see specifics in tan box below). Outer zone widths are:

- Large and medium Type F and Type SSBT streams: 70 feet
- Small Type F and Type SSBT, and large and medium Type N streams: 45 feet

Note: There is no outer zone for Type D streams.

See Table 3-2 on page 63.

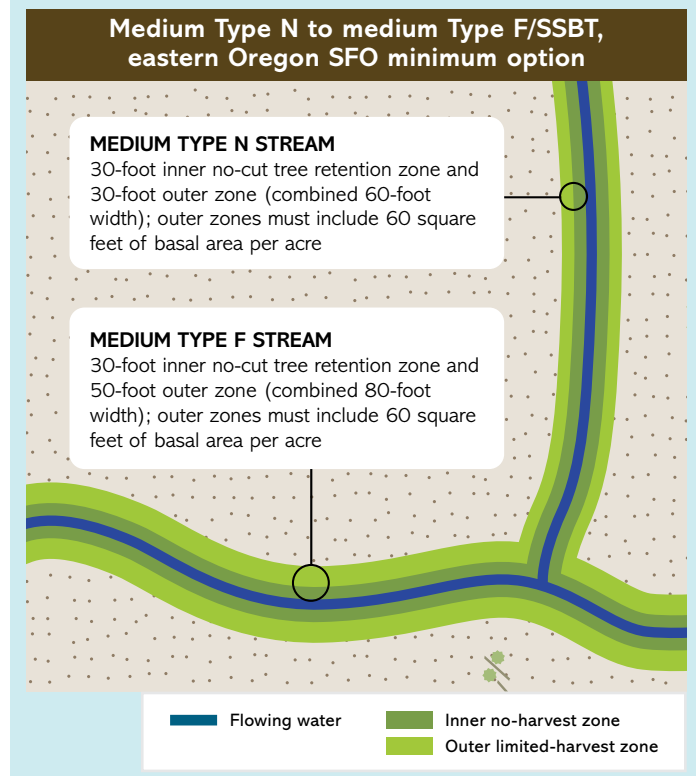


E SFO minimum: For all stream sizes and types except small Type D, an **inner zone** no-cut tree retention area width of 30 feet is required. The inner zone width of small Type D streams is 20 feet. For the **outer zone**, tree harvest is permitted with a written plan, but an equipment limitation zone (ELZ) must be adhered to and 60 square feet of basal area per acre must be retained in a way that facilitates stand health and fire resiliency (see specifics in tan box below). Outer zone widths are:

- Large Type F and Type SSBT streams: 70 feet
- Medium Type F and Type SSBT streams: 50 feet
- Medium N and small Type F and Type SSBT streams: 30 feet
- Large Type N streams: 45 feet

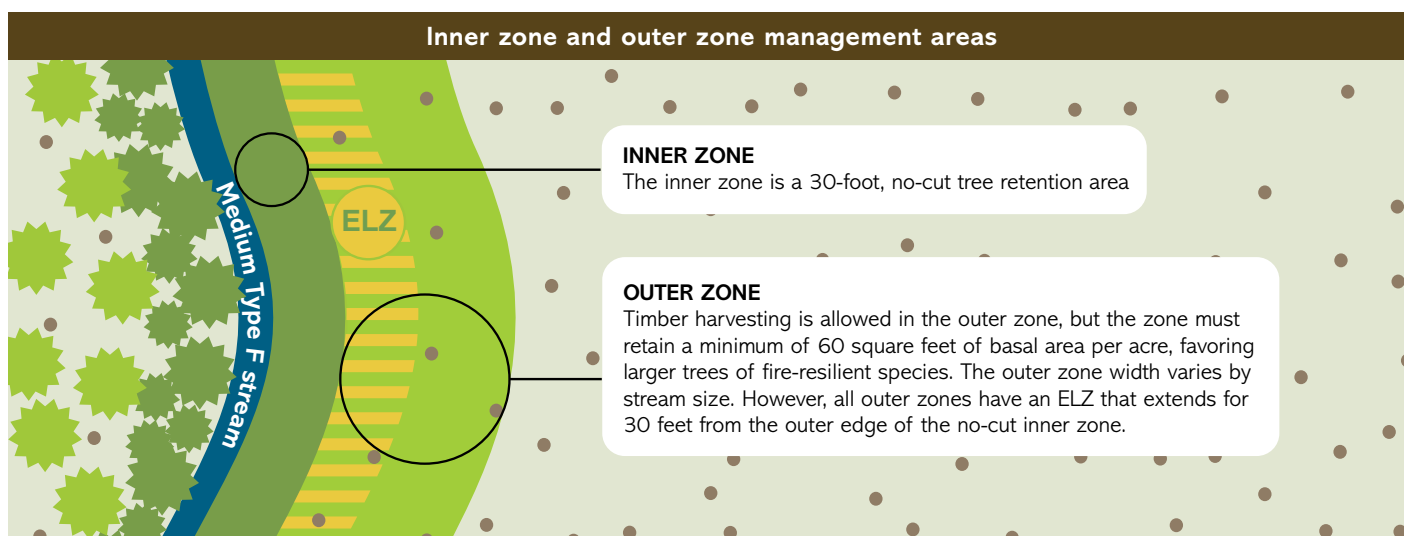
Note: There is no outer zone for Type D streams.

See Table 3-4 on page 66.



OUTER ZONE MANAGEMENT IN EASTERN OREGON

The rules for outer zone management in eastern Oregon are intended to create riparian areas that have sufficient fire-resilient tree cover through active management. The rules outline specific guidelines for how to meet that intent, leaving room for flexibility based on the existing conditions through use of a written plan. A written plan should describe existing forest stand conditions, and how, specifically, the operation will meet the outer zone basal area minimum and goals for fire resiliency and overall stand health.



While these tree retention areas (inner zone only in eastern Oregon) are technically no-cut buffers, falling, moving or harvesting vegetation, snags or trees is permitted in certain circumstances, such as for road construction and temporary stream crossings (see the Roads and Water Crossings chapter), yarding corridors (see the Harvesting chapter), or for stream improvement (see page 93). Management within the tree retention area is possible in certain circumstances with a written plan, including precommercial thinning for growth, survival and fire resiliency in both regions, or in the outer zone in eastern Oregon. See pages 94 and 96 for additional circumstances. Ensure you have reviewed and meet the requirements from other sections before planning to cut trees within tree retention areas.

Within the required tree retention area distances for both regions (inner zone for eastern Oregon only), retain:

- all trees and vegetation within the distances from the edge of the active channel or channel migration zone
- all trees leaning over the channel
- all downed wood and snags that are not safety or fire hazards. (Any trees felled for these reasons must be left in place unless used for stream improvement projects.)

For eastern Oregon only, within the outer zone, retain:

- a minimum of 60 square feet of basal area per acre in well-distributed trees
- 27 trees from the largest diameter class per acre toward the basal area target
- trees greater than eight inches in diameter at breast height until the basal area target is reached
- when present, fire-resilient trees, including ponderosa pine, Douglas-fir, western larch and hardwoods
- a distribution of different species and sizes of trees that promote fire resiliency and overall stand health

A written plan is required to manage within the outer zone and should describe the current conditions in the riparian management area, as well as how the operation will meet the basal area minimum and promote fire resiliency and overall stand health. Operators must adhere to a 30-foot ELZ from edge of the inner zone on all stream types under both the standard practice and the SFO minimum option. If the inner zone is not applicable, then the 30-foot ELZ would start at the edge of the active channel.

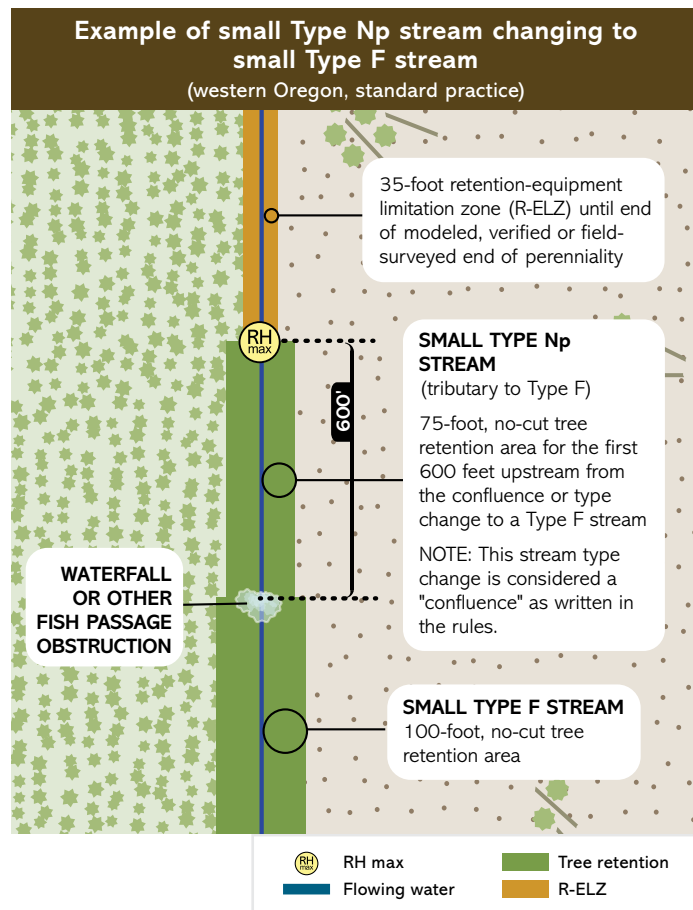
The field situation is rarely as simple as this example. It is likely that, if you have a Type F, Type SSBT or larger Type N stream, there will be tributaries to that stream within the timber harvest area. This situation will be addressed in Example 2.

Field scenario questions for Example 1

1. What if my stream type changes size (or from fish-bearing to non-fish-bearing) along the stream length that is adjacent to the timber harvest area?

In either case, treat the stream as if it has two segments split at the location where the stream changes size or type; each segment receives the protection that matches its type. You may not average tree retention area width along the two different segments.

If the stream type change is from a small Type Np to a Type F or Type SSBT, the layout upstream of the type change should follow the tiered protections required for small Type Np streams flowing into Type F or Type SSBT streams (as addressed in Example 2). The point of type change, which is likely to be a fish obstruction such as a waterfall, is considered a "confluence" as written in the rules.



Note: This diagram uses westside, standard practice measurements, but the inline stream protection layout concept illustrated for this field scenario will be the same for all landowner sizes and in eastern Oregon.

2. What if an existing road within a tree retention area has hazardous trees that need to be removed?

Where vegetation retention area requirements span a road and adjacent trees present a safety risk, there is a provision to remove them, provided the following:

- the width of the area of harvested trees is less than 15 feet on the upslope edge of the road
- an equivalent basal area is retained elsewhere in the unit adjacent to the tree retention area

3. Can I count trees in the tree retention area toward my wildlife leave tree requirements?

Yes, you may count trees in harvest Type 2 or Type 3 units that otherwise meet the wildlife tree requirements, within all or a portion of the tree retention areas and ELZs, depending on stream type. As a reminder, wildlife trees must have a minimum diameter at breast height of 11 inches and be at least 30 feet tall. For more information on wildlife tree requirements, see the Wildlife chapter.

W Western Oregon, standard practice

- medium and large Type F and Type SSBT streams: **all trees within the outer 20 feet** of the required width
- small Type F and Type SSBT, Type D, and Type Np and Type Ns streams where tree retention areas are required: **all trees** within the required widths

W Western Oregon, SFO minimum option

- medium and large Type F and Type SSBT streams: **all trees within the outer 20 feet** of the required width
- small Type F and Type SSBT and all Type N streams where tree retention areas are required: **all trees** within the required widths

Forest Conservation Tax Credit (FCTC)

- all trees retained within the FCTC area (the difference between the SFO minimum option and the standard option)

E Eastern Oregon, standard practice

- along all stream types: **all retained trees in the outer zone** that otherwise meet wildlife leave tree requirements

E Eastern Oregon, SFO minimum option

- along Type F, Type SSBT and Type N streams: **all retained trees in the outer zone** that otherwise meet wildlife leave tree requirements

4. What if the tree retention area or R-ELZ is densely stocked with young or small trees and requires precommercial thinning?

Precommercial thinning is permitted to retain growth and survival of the young trees in reforested areas, or to promote fire resiliency, with a written plan. Your written plan should describe how your treatment will facilitate achieving the desired future conditions for riparian management areas (RMAs).

5. What if the tree retention area is densely stocked with commercial trees and requires thinning?

You can propose thinning in overstocked RMAs with trees of commercial size, but this requires filing a plan for an alternate practice (PFAP) and approval from an Oregon Department of Forestry (ODF) stewardship forester (see page 96). Updated basal area tables were retained after the Private Forest Accord agreement was reached to help plan for and justify thinning in these cases.



Oregon forest practice rules allow for precommercial thinning in dense stands near streams, with a written plan.

Example 2

TYPE Ns OR TYPE Np STREAMS

Small Type N streams are separated into two different types based on the seasonality of flow. Type Np streams are perennial and have flowing water year-round. Type Ns streams have a defined channel, but are seasonal and dry up for part of the year. For the purpose of the Oregon Forest Practices Act, if no channel is present, there is no stream. All channels – and therefore streams – receive at least an ELZ. Note that ELZ requirements are defined by region and not the size of the forestland. There is no SFO minimum option for ELZs, because the harvesting of commercial-size trees is not restricted in an ELZ.

W Western Oregon

Type Ns streams in western Oregon have a 35-foot-wide ELZ, no matter what type or size stream they flow into. All Type Np streams receive at least an R-ELZ, also 35 feet wide. Proximity to the confluence of the Type Np stream with the Type F or Type SSBT stream determines the required protection. For a specified distance upstream from the confluence of Np streams flowing into Type F or Type SSBT streams, additional protection beyond the R-ELZ is required.

E Eastern Oregon

Type Ns streams in eastern Oregon have a 30-foot-wide ELZ, unless they flow directly into a Type F or Type SSBT stream, where an R-ELZ is required upstream from the confluence. All Type Np streams receive at least an R-ELZ, also 30 feet wide. Proximity to the confluence of the Type Np stream with the Type F or Type SSBT stream determines the required protection. For a specified distance upstream from the confluence of Type Np and Type Ns streams flowing into Type F or Type SSBT streams, additional protection beyond the R-ELZ or ELZ is required.

In eastern Oregon, Np streams are further classified as terminal or lateral. A terminal stream is the largest Type Np stream in a basin that is immediately upstream of a Type F or Type SSBT stream. Laterals are other non-terminal Type Np streams within the basin. These classifications are found on ODF's FPA Streams and Steep Slopes viewer and within the Forest Activity Electronic Reporting and Notification System (FERNS). See the diagram on the next page to help with interpreting terminal and lateral designations.

E Interpreting terminal and lateral stream designations in eastern Oregon

NOTE:

Only the perennial portion of the stream is designated as terminal or lateral. You may see a stream segment closest to the Type F/SSBT stream identified as terminal or lateral, but not its full length.



TYPE Np STREAM (TERMINAL)

A terminal Type Np stream is in line with and immediately upstream of the confluence with a Type F or Type SSBT stream.

In this example, when the main stem switches from a fish-bearing to a non-fish-bearing stream, it receives the terminal Type Np stream designation.

CONFLUENCE

Fish traveling upstream will eventually encounter a drop in water volume or a fish passage obstruction, such as a waterfall.

The point where a Type F or Type SSBT stream becomes non-fish-bearing will be identified as a confluence and the upstream segment identified as a Type Np stream, even if the streams are in line with one another.



TYPE Np STREAM (LATERAL)

A lateral Type Np stream is any Type Np stream that flows into, but is not in line with, a Type F or Type SSBT stream.

SMALL TYPE F OR TYPE SSBT STREAM

	End of stream channel		Inner no-harvest zone
	RH max		Outer limited-harvest zone
	Dry channel		ELZ
	Flowing water		R-ELZ

TYPE NP TO MEDIUM OR LARGE TYPE N

Small Type Np streams flowing into medium or large Type N streams do not fall within the definition of the Area of Inquiry and thus do not require a tree retention area, or a R-ELZ. This is true even if the cumulative upstream distance (including the medium or large Type N segment) from a Type F or SSBT stream is less than the RH max.

IF THE TYPE Np STREAM FLOWS INTO A TYPE F OR TYPE SSBT STREAM WITHIN A CERTAIN DISTANCE, A TREE RETENTION AREA MAY BE REQUIRED.

W Western Oregon

To determine what the next step is if you're in western Oregon, answer the following question:

Does the closest portion of the Np stream within the timber harvest unit flow directly into a Type F stream within 600 feet, or a Type SSBT stream within 1,150 feet (slope distance)?

If you answered no, protections are simply a 35-foot ELZ on both sides of the Type Ns stream and a 35-foot R-ELZ on both sides of the small Type Np stream. You may operate equipment and harvest trees within the ELZ but must minimize disturbance to vegetation and soil. In addition, for R-ELZs along Type Np streams, all trees less than 6 inches in diameter at breast height (DBH) and shrub species must be retained where possible. Where soil disturbance exceeds 10% in ground-based logging units and 20% in cable units, the operator must take corrective action to replace the equivalent of lost functions in consultation with an ODF stewardship forester.

If you answered yes, a tree retention area will be required for all or part of the Type Np streams within the unit, and an R-ELZ will be required for any portion upstream of the RH max (see the "Understanding RH max" sidebar on the next page). Continue reading to learn how to lay out protections for these tributaries.

E Eastern Oregon

To determine what to do next if you're in eastern Oregon, answer the following questions:

Does the closest portion of a terminal Type Np stream within the harvest unit flow into a Type F or Type SSBT stream within 500 feet (slope distance)?

Or, does the closest portion of a lateral Type Np stream within the harvest unit flow into a Type F or Type SSBT stream within 250 feet (slope distance)?

Or, does the closest portion of a Type Ns stream within the harvest unit flow into a Type F or Type SSBT stream within 750 feet (slope distance)?

If you answered no to these questions, protections are simply a 30-foot ELZ on both sides of the Type Ns stream and a 30-foot R-ELZ on both sides of the small Type Np stream.

You may operate equipment and harvest trees within the ELZ but must minimize disturbance to vegetation and soil. In addition, for R-ELZs along small Type Np streams, all trees less than 6 inches DBH and shrub species must be retained where possible. Where soil disturbance exceeds 10% in ground-based logging units and 20% in cable units, the logging operator must take corrective action to replace the equivalent of lost functions in consultation with an ODF stewardship forester.

UNDERSTANDING RH MAX

The RH max is the maximum tree retention distance described for any small Type Np stream that flows into a Type F or Type SSBT stream. What “RH” stands for is not defined in the Forest Practices Act rules, but it refers to the maximum upstream distance along the Type Np stream that will require a protective tree retention, or “retention harvest,” area. The distance to the RH max from the confluence, and thus the length of the required tree retention area along a Type Np stream, varies depending on whether the stream flows into a Type F or Type SSBT stream (westside), or whether the Type Np stream is terminal or lateral (eastside).



Use the Oregon Department of Forestry's FPA Streams and Steep Slopes viewer to identify small Type N streams within your planned timber harvest area, determine or plan to survey for their presence or perennality, and estimate their upstream distance from a confluence with a Type F or SSBT stream.

If you answered yes to these questions, a tree retention area will be required for all or part of the terminal and lateral Type Np streams within the timber harvest unit, and an R-ELZ will be required for all or part of the Type Ns streams within the unit. Continue reading to learn how to lay out protections for these tributaries.

LAYING OUT PROTECTIONS FOR A TYPE Np STREAM THAT FLOWS INTO A TYPE F OR TYPE SSBT STREAM

This layout process is the same for all regions and the small forestland owner minimum option, but required lengths and widths are different.

To determine these key points, landowners have three options: They can conduct an operational field survey, use data from a previously approved operational field survey, or work with a modeled end of perennality (EOP). When modeled EOP data is available from ODF, it will be found via the forest practices planning website (oregon.gov/odf/working/pages/fpa.aspx) or in FERNs. For a detailed explanation of the stream surveying process, see page 98.

Initiating protection layout for Type Np (and Type Ns in eastern Oregon) tributaries to Type F and Type SSBT streams is best done as an office exercise after initial field work is completed. Use a detailed map that includes the timber harvest unit boundaries and the hydrography statewide flow line layer to identify stream locations and types. Follow these steps to design the required riparian area protections on paper before laying them out in the field:

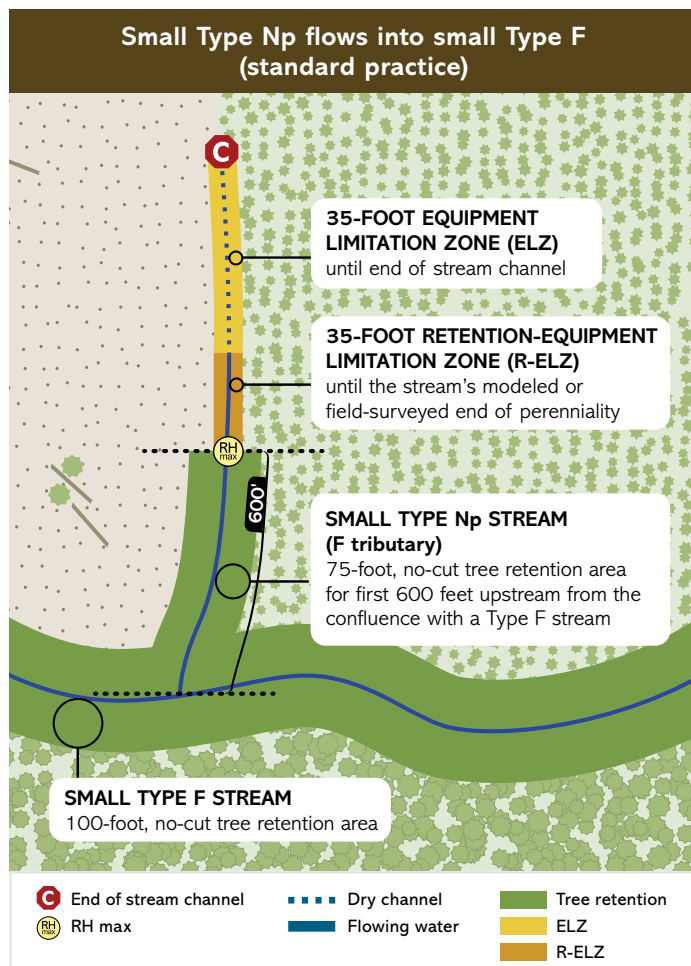
1. Locate key points along the small Type Np stream, including:
 - > verified, modeled or operational field-surveyed EOP
 - > verified, modeled or operational field-surveyed end of channel
 - > if field-surveyed, any short water (flowing water less than 25 feet long) found beyond the EOP, but within the Area of Inquiry
 - > for an SFO taking the tax credit only: if field-surveyed, any areas of dry channel 100 feet or greater in length occurring before the EOP and before the RH max
2. Identify whether the Type Np stream flows into a Type F or Type SSBT stream.
3. For eastern Oregon only, identify whether the small Type Np stream is lateral or terminal.
4. Begin at the confluence of the small Type Np stream (and Type Ns in eastern Oregon) with the Type F or Type SSBT stream, and work upstream to apply the required protections.

Note: If the modeled EOP is not yet available, no previously approved field surveys are available on ODF's forest practices website or in FERNs, and no field survey has been conducted, all small Type N streams should be treated conservatively as Type Np streams.

W Western Oregon small Type Np stream that flows into a Type F stream

W **Standard practice:** Leave a 75-foot-wide tree retention area on both sides of the stream for 600 feet upstream along the Type Np stream from the confluence with the Type F stream. The end of the 600 feet is the RH max.

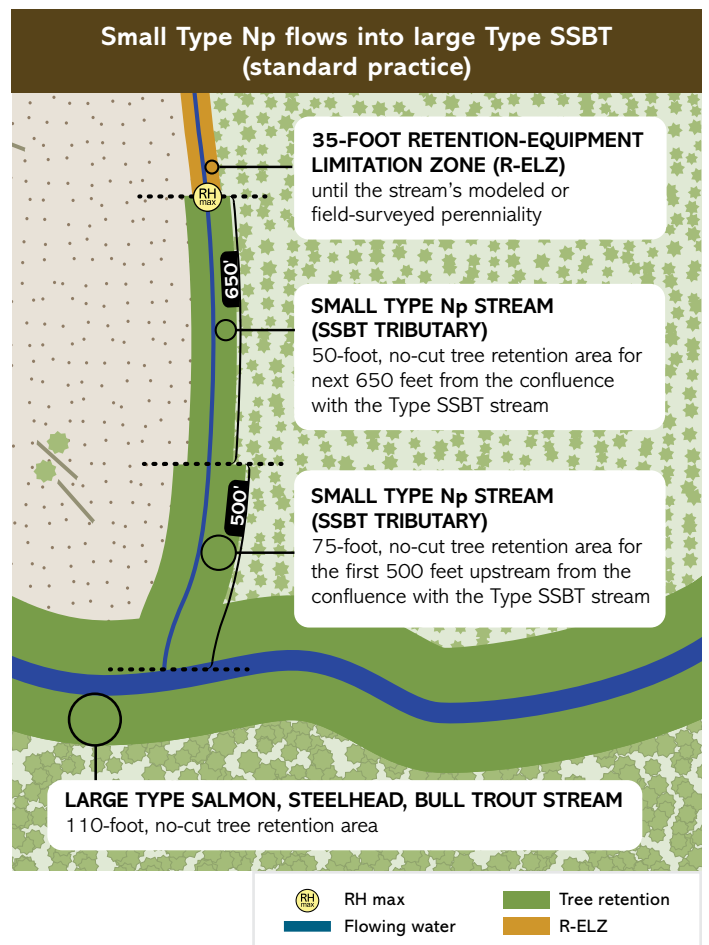
W **SFO minimum option:** Leave a 35-foot-wide tree retention area on both sides of the stream for 600 feet upstream along the Type Np stream from the confluence with the Type F stream. The end of the 600 feet is the RH max.



W Western Oregon small Type Np stream that flows into a Type SSBT stream

W **Standard practice:** Leave a 75-foot-wide tree retention area on both sides of the stream for 500 feet upstream along the Type Np stream from the confluence with the Type SSBT stream, and then a 50-foot-wide tree retention area for an additional 650 feet upstream. The sum of the two lengths, 1,150 feet, is the RH max.

W **SFO minimum option:** Leave a 35-foot-wide tree retention area on both sides of the stream for a maximum distance of 1,150 feet upstream of the Type SSBT stream. The end of the 1,150 feet is the RH max.



E Eastern Oregon small Type Np stream that flows into a Type F or Type SSBT stream

E Standard practice, terminal stream: Leave a 30-foot-wide inner zone tree retention area and a 30-foot-wide outer zone on both sides of the small Type Np stream for 500 feet upstream from the confluence with the Type F or Type SSBT stream. All other inner and outer zone retention requirements apply (refer to details in Example 1 on page 75). The end of the 500 feet is the RH max.

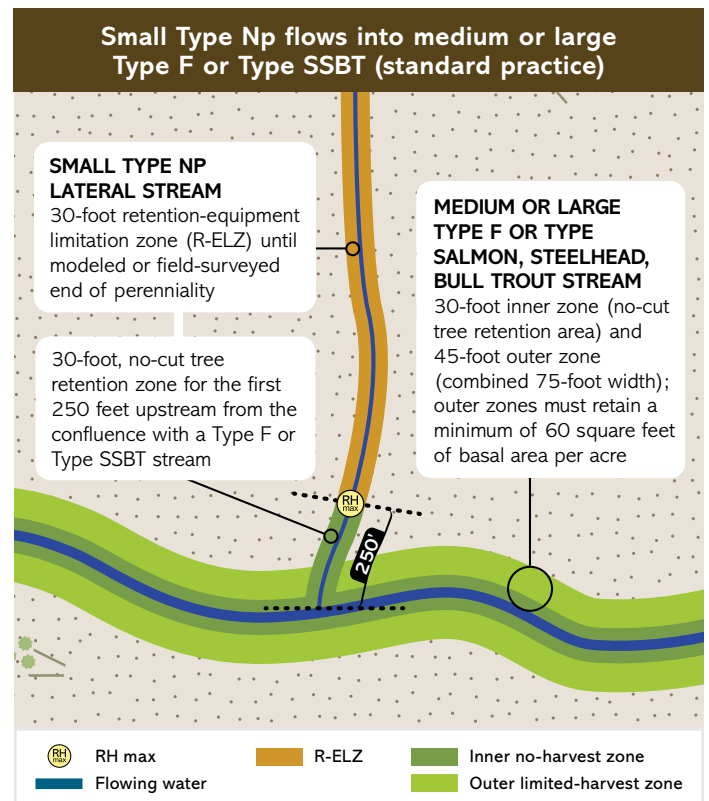
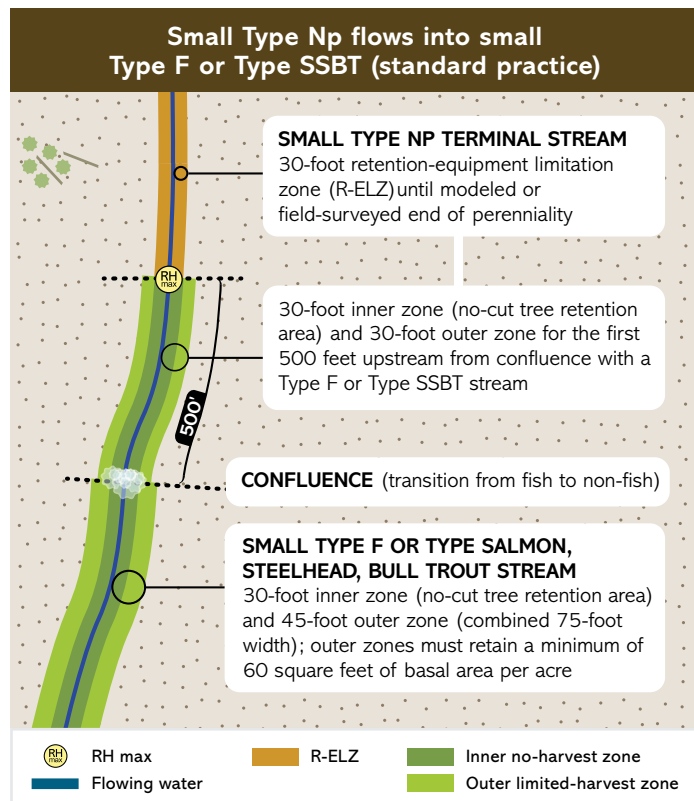
E Standard practice, lateral stream: Leave a 30-foot-wide inner zone tree retention area on both sides of the small Type Np stream for 250 feet upstream from the confluence with the Type F or Type SSBT stream. All other inner zone tree retention area requirements apply (refer to details in Example 1 on page 75). There is no outer zone. The end of the 250 feet is the RH max.

E SFO minimum option, terminal stream:

Leave a 20-foot-wide inner zone tree retention area and a 20-foot-wide outer zone on both sides of the small Type Np stream for 500 feet upstream from the confluence with the Type F or Type SSBT stream. All other inner and outer zone retention requirements apply (refer to details in Example 1 on page 75). The end of the 500 feet is the RH max.

E SFO minimum option, lateral stream:

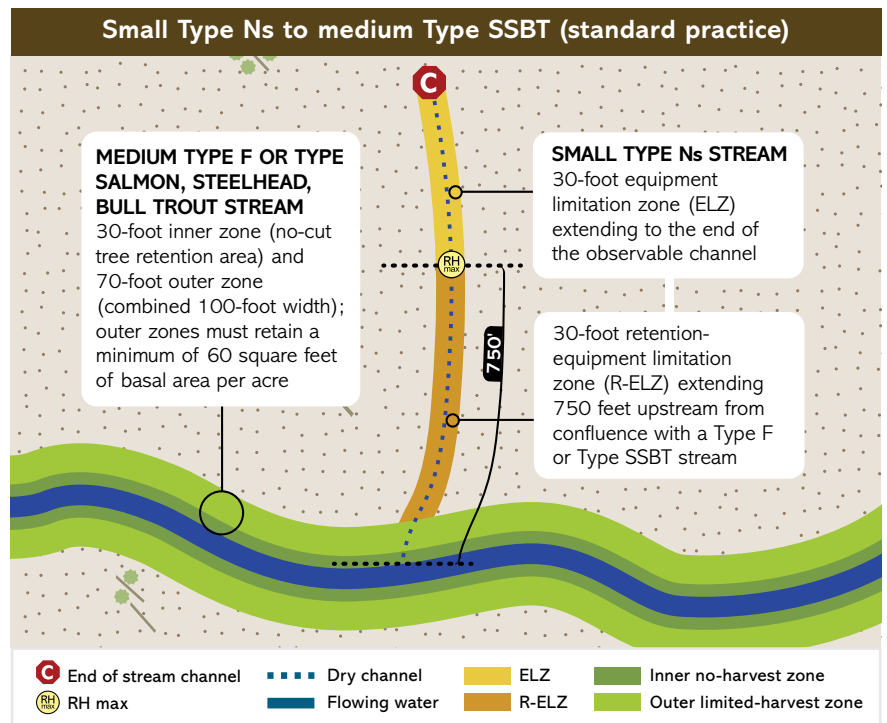
Leave a 20-foot-wide inner zone tree retention area on both sides of the small Type Np stream for 250 feet upstream from the confluence with the Type F or Type SSBT stream. All other inner zone tree retention area requirements apply (refer to details in Example 1 on page 75). There is no outer zone. The end of the 250 feet is the RH max.



E Eastern Oregon small Type Ns stream that flows into a Type F or Type SSBT stream

E E Standard practice and SFO minimum option

A 30-foot-wide R-ELZ is required, extending 750 feet upstream from the confluence with the Type F or Type SSBT stream. Note: This is the only situation where a Type Ns stream receives an R-ELZ. The end of the 750 feet is the RH max. (See diagram, right.)



ONCE YOU'VE IDENTIFIED THE TYPE Np STREAM SCENARIO THAT APPLIES TO YOUR HARVEST UNIT, CONTINUE HERE

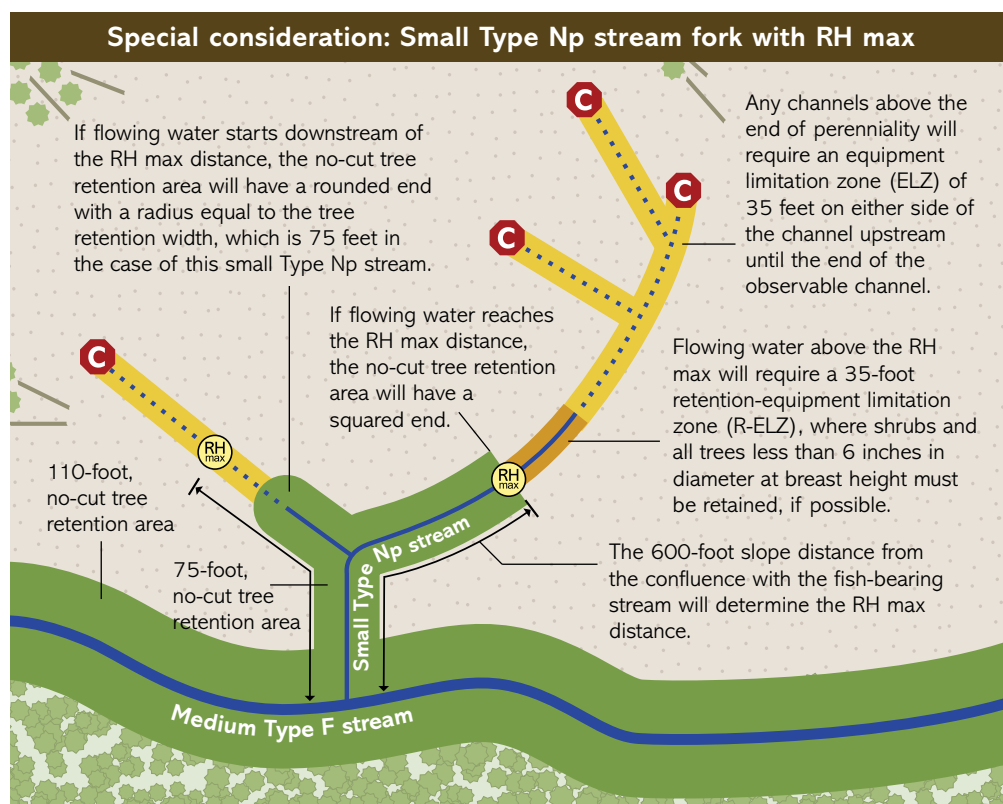
Working upstream from the confluence, layout depends on which of the following situations happens first. If the Type Np stream:

- Extends upstream beyond the timber harvest unit and/or property line.** Protections apply as described for the distances listed until the RH max is reached, or the stream leaves the property or the edge of the unit.
- Branches out.** When the Type Np stream branches out, each branch is eligible for perennial protection provided the branches are Type Np streams. The distances extend from the confluence of the Type Np stream with the Type F or Type SSBT stream, and accumulate in an upstream direction for each branch of the Type N stream system. The distances do not reset at the branch. If one branch is Type Ns, the tree retention area only extends up the Type Np branch. The eastern Oregon 30-foot or western Oregon 35-foot ELZ will apply to the Type Ns branch. (See diagram, page 82, top.)
- Reaches end of perennality (EOP).** When the verified, modeled or operational field-surveyed EOP is reached before the RH max, the vegetation retention area will have a round end with a radius equal to the buffer width. An ELZ extends beyond the RH max for the length of the channel (see the left branch in the diagram, page 82, top).
- Extends upstream beyond the RH max within the harvest unit.** If the end of the required tree retention area is reached (RH max) within the harvest unit, the EOP will determine the next stage of layout. Where perennality

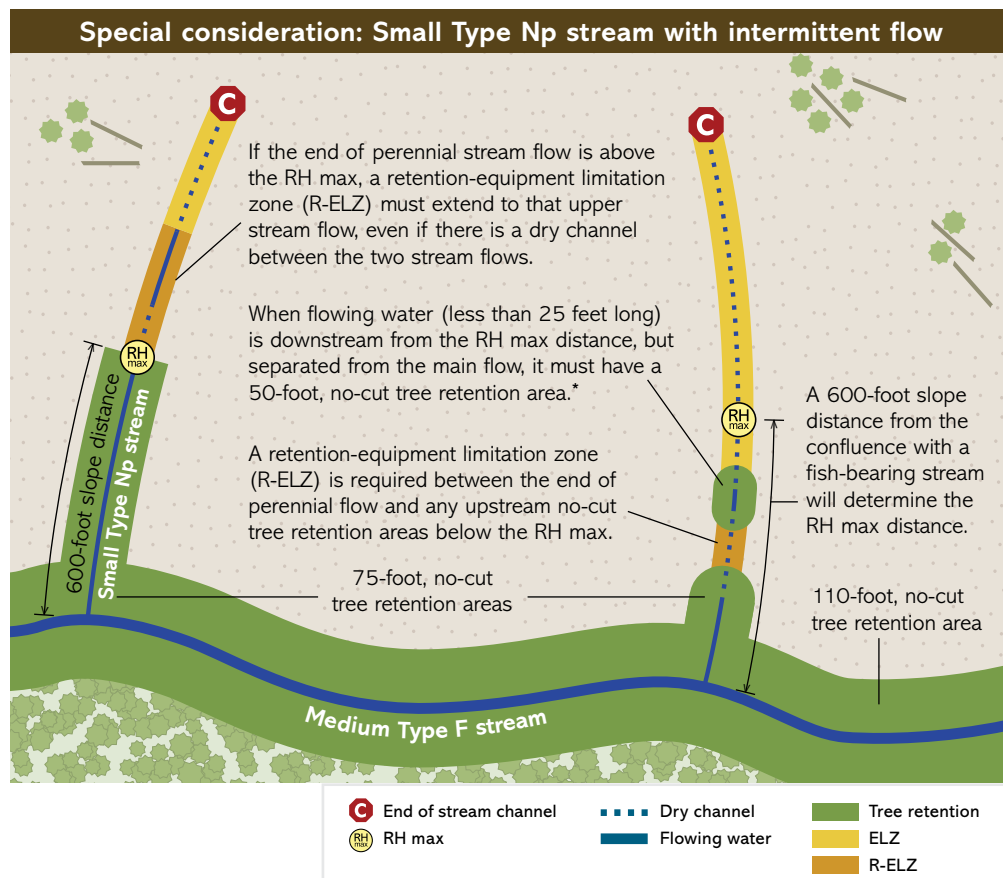
extends upstream of the RH max, the tree retention area will terminate at the RH max with a perpendicular end (see right branch of the diagram, page 82, top). An eastern Oregon 30-foot or western Oregon 35-foot R-ELZ extends upstream from there, until the EOP. Once the EOP is reached, an eastern Oregon 30-foot or western Oregon 35-foot ELZ extends to the end of the channel.

Note: Where a) the stream channel crosses a property boundary; b) the RH max has been reached; c) the EOP has not been established within the harvest unit; and d) there is no stream status information upstream of the property line, then an R-ELZ continues from the RH max to the property line, no matter the flow status of the stream. R-ELZ protections are applied in case a short section of dry channel happens to exist at the property line, but a flow feature exists in the channel on the neighboring property. See the tan sidebar on page 83 and question on page 84.

Note: If a stream survey was conducted, flow features within the 250-foot Area of Inquiry extend perennial protections to the end of the farthest upstream flow feature, even when there is a dry channel between them (see left side of the diagram, page 82, bottom). For detailed information on the stream survey process and the Area of Inquiry, see page 98.



Note: This diagram uses westside, standard practice measurements, but the concepts illustrated apply to both sizes of forestland and in both regions of Oregon.



*Flowing water must be within the Area of Inquiry (AOI), above perenniality and below RH max. If there is enough dry channel in between that AOI is exhausted, this would not receive a 50-foot buffer. (OAR 629-643-0130)

Note: This diagram uses westside, standard practice measurements, but the concepts illustrated apply to both sizes of forestland and in both regions of Oregon.

Field scenario questions for Example 2

1. What if flowing water less than 25 feet in length (short water) was found within the Area of Inquiry (AOI) during a survey?

Large forest landowner, both regions: If the short water is found within the AOI, upstream of the EOP and before the RH max, the short water receives a 50-foot tree retention area and an R-ELZ between it and the downstream tree retention area. This creates a shape like a dog bone, narrower in the middle and wider on the ends. You can also think of it as “dotting the ‘i.’” See the right side of the lower diagram on page 82.

SFO, both regions: If the short water is found within the AOI, upstream of the end of perennality and before the RH max, the short water receives a 35-foot tree retention area and an R-ELZ between it and the downstream tree retention area. This creates a shape like a dog bone, narrower in the middle and wider on the ends. You can also think of it as “dotting the ‘i.’” See the right side of the lower diagram on page 82.. (Note: SFOs will use a 35-foot tree retention area instead of the standard 50-foot buffer indicated in the diagram.)

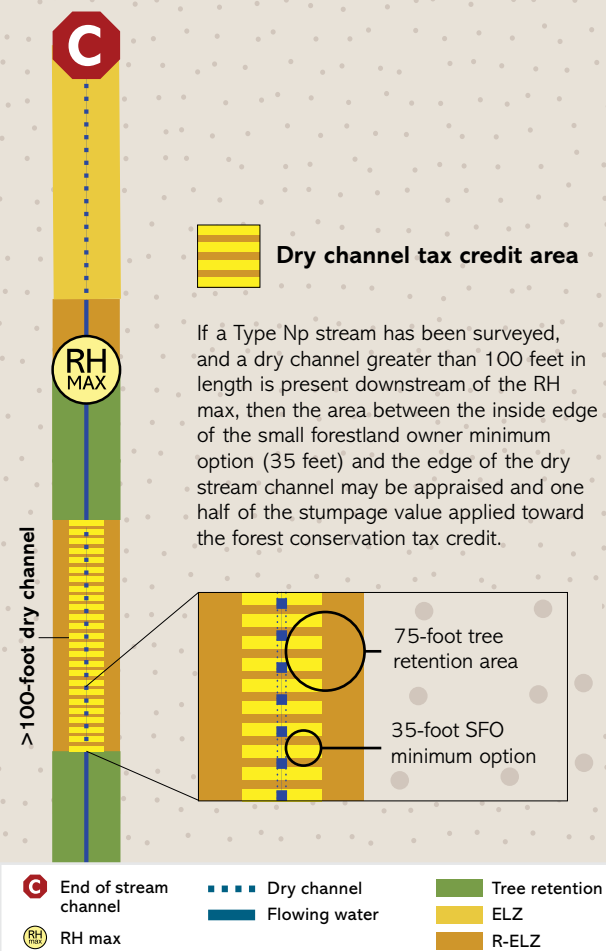
LAYING OUT PROTECTIONS WHERE SMALL TYPE N STREAMS CROSS A PROPERTY LINE

Unique layout issues arise when a small Type N stream crosses a property line and the flow status on the neighboring property is unknown. The easiest way to approach this situation is to get permission from your neighbor to conduct a complete survey of the stream. When surveying the stream on the neighboring property is not an option, the property line scenarios found in question 3 represent a conservative approach (as described in the Forest Practices Act rules), which applies the maximum protections for the stream type. The described scenarios are examples of the most basic situations that may be encountered in the woods. Obtain the most complete information you can about the stream, and discuss the application of protections for the situation on your property with your stewardship forester.

2. What if a section of dry channel is found within the Area of Inquiry between the confluence of a Type Np stream with a Type F or Type SSBT stream and the RH max?

This applies only to small forestland owners taking the Forest Conservation Tax Credit (FCTC). It is meant to provide some financial compensation for the protection of dry channels. In this instance, if the stream has been surveyed and more than 100 feet of dry channel is found between two flow features downstream of the RH max, one-half of the stumpage value between the minimum option and the edge of the dry channel (35 feet in western Oregon or 20 feet in eastern Oregon) is included in the tax credit. This is the only instance in the FCTC rules where one-half of the stumpage value is assigned.

Dry channel tax credit area on small Type Np stream that has been surveyed



3. What if a Type Np stream crosses a property line, the Area of Inquiry crosses the property line, and the upstream or downstream status of the stream is unknown?

If a landowner receives permission to go onto the neighboring property, the entire stream can be surveyed as if it is on one ownership and protections laid out as described in the preceding section.

A landowner cannot be compelled to conduct a stream survey on a neighboring property, but modeled information or previous surveys may already be available in ODF's streams mapping and FERNS. Where this information is not available, layout is based on assumptions that provide the most protection for the Type Np stream. Continue reading for details that apply to whether you are the upstream or downstream neighbor.

When you are the upstream neighbor

If end of perennality has been determined to be downstream, an unknown stream can be considered Type Ns.

If a partial downstream survey has been completed and is available in ODF's streams mapping or FERNS, and the upstream landowner utilizes the downstream information to complete the survey upstream, protections can be applied as if the stream survey is complete.

If no survey exists downstream and the area cannot be surveyed, the upstream landowner must assume flowing water extends to the property line and begin the Area of Inquiry at the property line. Use map distances to locate the RH max and lay out protections accordingly.

When you are the downstream neighbor

Where the RH max is reached, end of perennality has not been established within the harvest unit (meaning the Area of Inquiry has not been completed and it crosses the property line), and there is no stream status information upstream of the property line, an R-ELZ continues from the RH max to the property line, no matter the flow status of the stream. R-ELZ protections are applied in case a short section of dry channel happens to exist at the property line, but a flow feature exists in the channel on the neighboring property.

4. What if a small Type Np flows to a medium or large Type N stream that then immediately flows into a Type F or Type SSBT stream, within the distance of the RH max?

Small Type Np streams that flow into medium or large Type N streams are not defined as within the Area of Inquiry and thus do not need to be surveyed. The protection is an ELZ for these streams, even if they are perennial and lie within the cumulative upstream RH max distance of the medium or large Type N's confluence with the Type F or Type SSBT stream.

5. What if a channel shown in ODF's FPA Streams and Steep Slopes viewer does not exist on the ground or is incorrectly mapped?

Both non-existent channels and incorrectly mapped features can be addressed using the process described in Small Type N Stream Guidance and Flow Permanence Field Survey Protocol, available at ODF's FPA website under "Forest Practices Technical Guidance". Documentation, including geospatial points taken while surveying on the ground, will need to be provided to update the regulatory layers. Geometry edits such as removing nonexistent stream segments and relocating stream channels that are incorrectly mapped can be made directly by ODF, without further review or approval required by ODFW.

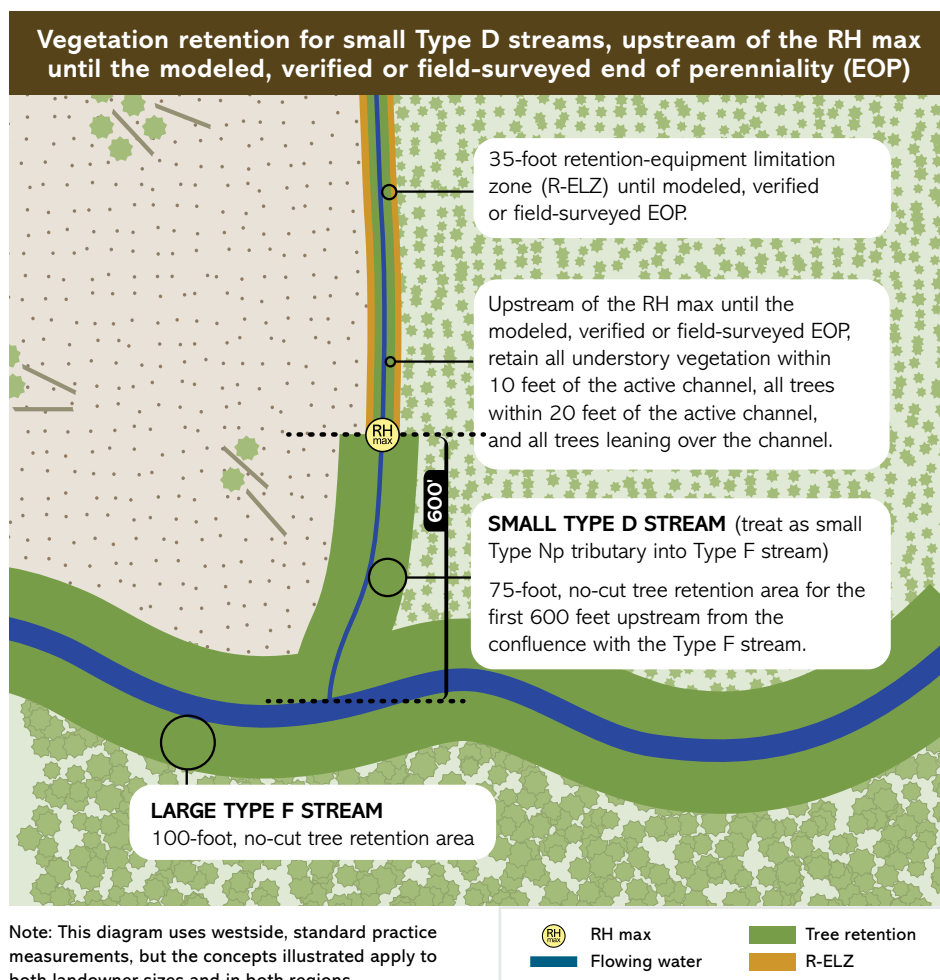
6. What if a mapped channel is non-continuous or is not connected to the Type F or Type SSBT stream (is reabsorbed into the soil and disappears)?

Channels can form and disappear within a unit, and perennial flow can appear, form a channel, and be reabsorbed completely within a unit, disconnected from the mapped hydrology. These situations are not uncommon, but each one is unique and may require different solutions. Document these conditions thoroughly during the field survey process and discuss how to lay out stream protections with your stewardship forester.

NOTE FOR SMALL FORESTLAND OWNERS

If the stream has been surveyed and the Area of Inquiry (AOI) extends across the property line, but there is not a flow feature in the last 100 feet, the tree retention area is extended to the shorter of the RH max distances or the farthest upstream flow feature within the property. This is essentially an exception for small forestland owners to not have to assume upstream flow across a property line. It allows termination of the tree retention area before an off-property RH max is reached. An R-ELZ is still required between the last flow feature and the property line.

If the stream has been surveyed on your property, the end of perenniality (EOP) is established, and the AOI occurs entirely on your property, but a flow feature exists in FERNS upstream of the property line, an R-ELZ is required from the EOP to the property line.



Example 3

SMALL TYPE D STREAM

As previously mentioned for all forestland owners in Example 1, medium and large Type D streams receive a 75-foot-wide tree retention area in western Oregon, and a 30-foot-wide tree retention area (with no outer zone) in eastern Oregon. If the Type D stream extends above where tree retention areas are required for a Type Np stream (above the RH max), an additional tree retention area is required (see diagram to the left). The additional protection is the same for western and eastern Oregon.

Logging operators must retain:

- all understory vegetation within 10 feet of the active channel
- all trees within 20 feet of the edge of the active channel
- all trees leaning over the channel

These retained trees can be counted toward wildlife trees if they otherwise meet the Forest Practices Act wildlife leave tree requirements.

Example 4

ALTERNATE PRACTICE

Can I propose another way to achieve the desired conditions for riparian management areas (RMAs)?

Yes. Under the rules for site specific vegetation retention (OAR 629-643-0400), you can submit a plan for an alternate practice (PFAP) in consultation with an ODF stewardship forester. Alternate practices are allowed specifically because written requirements cannot fit every situation and alternatives may work better. The PFAP is a document prepared by the landowner, logging operator or timber owner, that describes practices different from those prescribed in state statutes or administrative rules. Common situations where a PFAP might be helpful include:

- overstocked conditions within tree retention areas
- hardwood-dominated RMAs where a new cohort of hardwoods or conifers could be planted
- tree removal and revegetation plans after catastrophic events, such as storms or wildfires

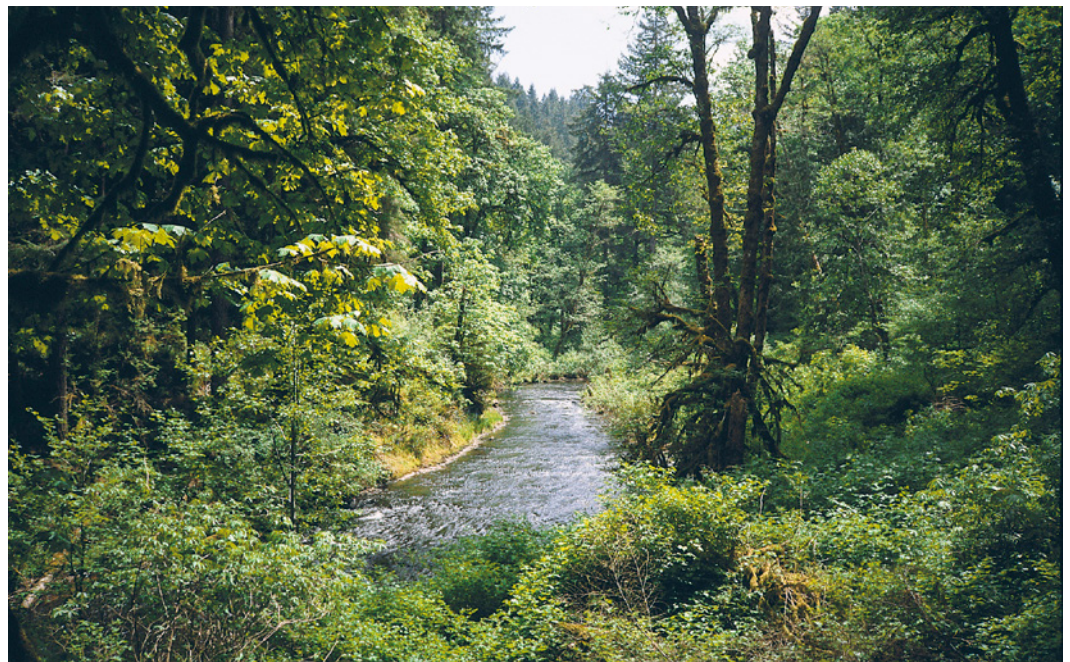
Proposed alternate practices must enhance or accelerate creation of the desired conditions for RMAs, and they require the approval of a stewardship forester. For more information, see "Site-specific vegetation retention prescriptions" on page 96.

If your need for an alternate practice is due to stand-level mortality, you may be able to utilize an alternative vegetation retention prescription. See page 94 for more details.



In riparian management areas that are conifer-growing sites currently dominated by hardwoods, especially red alder, more extensive harvesting may be allowed so that conifers can be planted. This is one of several reasons to utilize site-specific vegetation retention rules and write a plan for alternate practice (see page 96).

In riparian management areas where the native tree community is hardwood-dominated stands, such as ash, cottonwood or maple, the goal is to retain and grow sufficient hardwood trees. Some timber harvesting may be needed for successful reforestation to replace dead and dying trees in these stands.



HARVESTING TIMBER NEAR A LAKE

Lakes have year-round standing open water. A lake includes the water, vegetation, aquatic life and habitats within the water and in beds, banks or wetlands below the normal high-water level. Water developments that are not part of a natural stream – including constructed features such as drainage and irrigation ditches; farm, stock and log ponds; and pump chances – are not considered lakes.

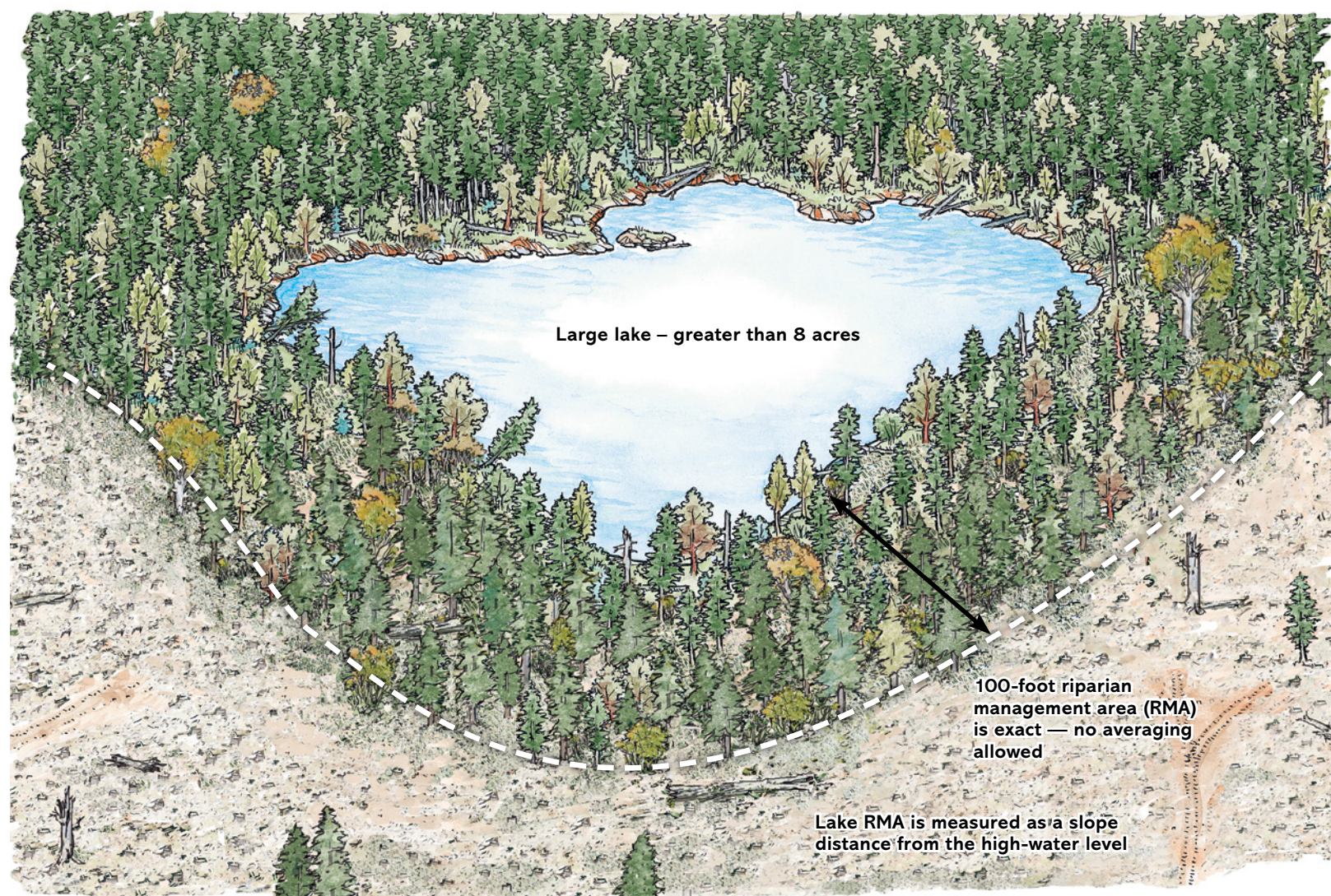
Two major classes of lakes

For the purposes of the Oregon Forest Practices Act, the two major classes of lakes are:

- **large lakes**, which are greater than 8 acres
- **other lakes** of two different types:
 - > between 1/2 acre and 8 acres, or less than 8 acres with fish
 - > less than 1/2 acre with no fish

The intent of the forest practice rules around lakes is to protect the following functions and values:

- water storage
- water quality
- water quantity
- habitats for aquatic plants, fish and wildlife



Protecting lakes during forest operations

Tree retention riparian management area (RMA) requirements for lakes are specified in Table 3-7. Note these same protections apply across regions and sizes of forestland; there is no small forestland owner minimum option.

The following protections apply to lakes during logging operations, and vary based on the size of the lake and whether it contains fish:

For large lakes:

- A written plan, reviewed by the Oregon Department of Forestry (ODF), is required for logging operations within 100 feet of a large lake.
- The tree retention RMA width is 100 feet, as measured from the high-water level. The 100-foot RMA is exact; no averaging is allowed.

For other lakes that have fish use or are between 1/2 acre and 8 acres:

- The tree retention RMA width is 50 feet, as measured from the high-water level.

For other lakes less than 1/2 acre that do not contain fish:

- No tree retention RMA is required.

Within all tree retention RMAs around lakes:

- Leave all trees along the edge of the lake. Additional leave trees should be well distributed within the RMA.
- All snags and down wood in the lake and RMA must be left. Snags felled for safety must be left on the ground and cannot count toward snag and live tree requirements in adjacent timber harvest areas.

- Logging or road-building operations must never cause sedimentation or drain lakes.
- Disturbance of understory vegetation should be limited to the minimum necessary to remove timber and achieve successful reforestation.
- Activities in the lake RMA must not impair water quality, disturb natural drainage or affect soil productivity.
- Timber felling, yarding and mechanical site preparation requirements in lake RMAs are covered in the Harvesting chapter.

Table 3-7 Lake protection requirements (all landowners and regions)

Class of lake	Riparian management area width (feet)	Retention requirements
Large lakes (greater than 8 acres)	100	Leave understory plants, all snags and down wood, and 50% of the trees by species and size*
Other lakes (between 1/2 acre and 8 acres, or fewer than 8 acres with fish)	50	Same as for large.
Other lakes (less than 1/2 acre, no fish)	No RMA	If more than 1/4 acre, leave snags and down wood**

*Leave 50% of the original live trees by species in each of the following size classes:

- 6-10 inches DBH
- 11-20 inches DBH
- 21-30 inches DBH
- greater than 30 inches

The goal is to leave approximately the same species and size distribution as before the timber was harvested near the lake.

**These can be counted toward requirements to leave snags and down logs in clearcut

HARVESTING TIMBER IN OR NEAR A WETLAND

Wetlands, especially smaller ones, are harder to identify than streams and lakes. Wet soils, surface water or groundwater, and water-tolerant plants can indicate a wetland. Plants found in wetlands include Oregon ash, Sitka spruce, cottonwood, willow, cattails, skunk cabbage, reed canary grass, rushes and sedges. Terms for specific types of wetlands include swamps, marshes, bogs and seeps. Water developments that are not part of natural streams or lakes — such as drainage and irrigation ditches; farm, stock and log ponds; and pump channels — are not considered wetlands.

Be aware that wetlands may dry out in the summer and have different sizes and shapes. If you're unsure about an area, check with the Oregon Department of Forestry (ODF) or seek specialized assistance.

WHERE TO FIND WETLANDS

- natural drainages or swales
- low areas with high-water tables
- flat valleys or depressions with poorly drained soils
- near streams, rivers and lakes
- lower slopes where springs or seeps emerge
- mountain meadows watered by snowmelt

Three classes of wetlands

- Significant wetlands include those greater than 8 acres, as well as estuaries, bogs and certain eastern Oregon springs of any size.
- Stream-associated wetlands are smaller than 8 acres and located next to streams.
- Other wetlands are smaller than 8 acres and include seeps and springs.

IMPORTANT WETLAND FUNCTIONS

- store surface water and groundwater
- maintain or improve water quality
- reduce flood impacts
- provide habitat for aquatic plants, fish and wildlife
- provide recreational opportunities, such as wildlife viewing

Protecting wetlands during forest operations

Oregon Forest Practices Act requirements are intended to provide protections for important wetland functions. Different classes of wetlands have slightly different protections based on their defining features, sizes and locations. Note that these same protections apply across all regions and sizes of forestland. Except around stream-associated seeps and springs, there is no small forestland owner minimum option.

Generally, follow these practices when operating in or near wetlands:

- When possible, avoid operations in wetlands and retain blocks of intact vegetation in and around them. If trees are removed, consider how reforestation will be accomplished.
- Minimize impacts to soil and understory vegetation, refraining from any disturbance that alters wetland function.
- Ground equipment must not cause rutting, soil compaction or sedimentation, or affect water quality.
- Successful logging operations may occur during dry or frozen conditions. Cable harvesting is an alternative, where appropriate.
- Converting or draining a wetland is not allowed, even for the purpose of establishing trees.

Details for the protection of different wetland classes are detailed below. (See Table 3-8 for a summary of the specifics for each wetland type.)

Significant wetlands

- A resource site evaluation by ODF is required for proposed logging operations within 300 feet of significant wetlands, followed by a written plan, if the operations conflict with the significant wetland or if machines will be operated within the wetland.
- Significant wetlands receive a tree retention riparian management area (RMA) of a width determined by ODF during the resource site evaluation. This width is measured from the edge of the wetland. (See Table 3-8.)
- All understory plants, snags and down wood, and one-half of the trees by species and size, must be left in the RMA.
- All trees at the immediate edge of the wetland must be retained.



Stream-associated wetlands

Give these areas the same protections required for the stream type they're associated with.

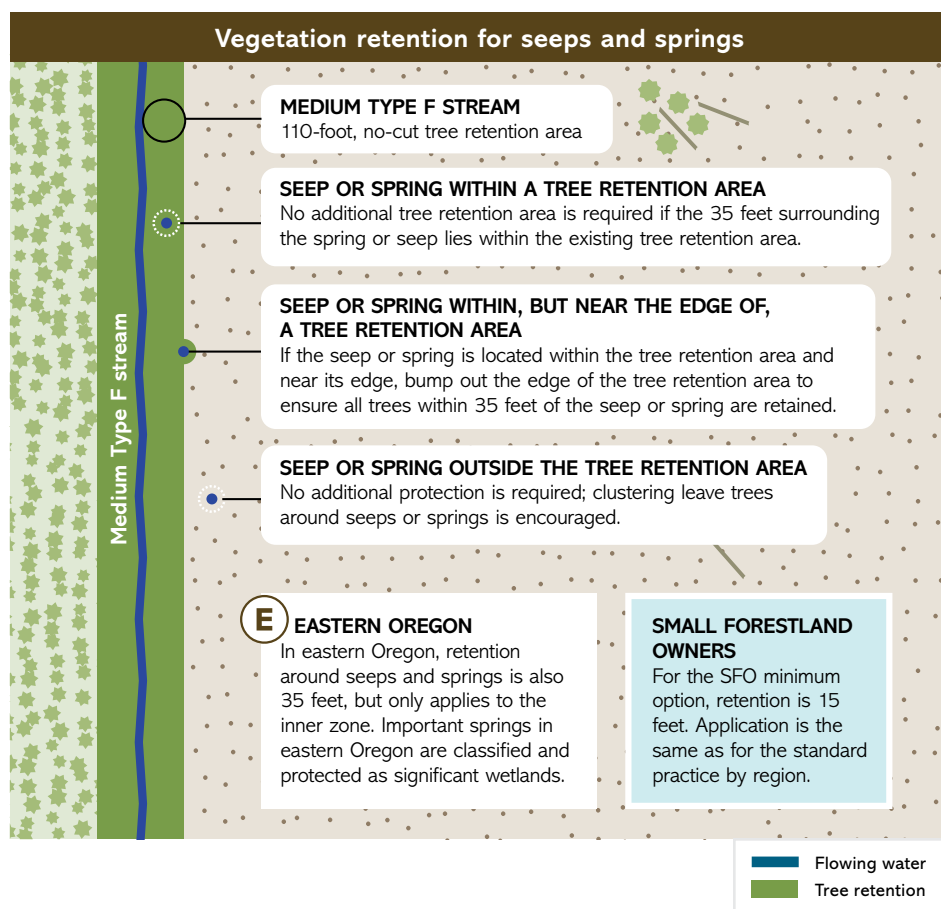
If a stream-associated wetland lies at the edge of or extends beyond the tree retention area of the stream, expand the tree retention area to entirely include the wetland plus at least 25 additional feet (see illustration, page 91). This requirement is the same across all regions, regardless of forestland size.

Other wetlands, including seeps and springs

- Apart from those associated with streams, there is no RMA required for other wetlands, seeps and springs.
- In a wetland larger than one-quarter acre, snags and down trees must be left standing. Snags felled for safety or fire risk must be left unyarded. Snags and downed wood left within a wetland can count toward wildlife and downed wood requirements for Type 2 and Type 3 harvests. Refer to the Wildlife chapter for further discussion of wildlife tree and downed wood requirements.

Stream-associated seeps and springs

Specific protection for seeps and spring-adjacent streams varies by region, size of forestland and chosen practice. The intent is to ensure that trees are retained around each seep or spring that occurs within the width of a tree retention area. If the seep or spring lies near the edge of the stream's tree retention area (or the inner zone in eastern Oregon), this effectively bumps out the overall width of the stream's tree retention area.



W Standard practice for western Oregon

- Where a seep or spring occurs in a tree retention area, all trees within 35 feet of the seep or spring must be retained.
- If the seep or spring is at the edge of the tree retention area, the width of the tree retention area should be expanded to include the seep or spring, plus 35 feet.
- Logging operators are encouraged to retain trees that meet wildlife leave tree requirements within timber harvest Type 2 or Type 3 units immediately adjacent to seeps and springs.

E Standard practice for eastern Oregon

- Where a seep or spring occurs within the inner zone, retain all trees within 35 feet of the seep or spring.
- If the seep or spring is at the edge of the inner zone, the width of the tree retention area should be expanded to include the seep or spring, plus 35 feet.
- Important springs in eastern Oregon are classified and protected as significant wetlands.

Small forestland owner (SFO) minimum option

For both regions

- The landowner must submit a standardized form to ODF when using the SFO minimum option around seeps or springs.
- If the tree retention area contains side channels and wetlands that extend beyond the riparian management area, the tree retention area should be expanded to entirely include any side channels and wetlands, plus at least 25 additional feet. Note that this requirement is the same across all regions and sizes of forestland.

W Western Oregon

- Where a seep or spring occurs in a tree retention area, retain all trees within 15 feet of seeps and springs.
- If the seep or spring does not lie fully within the tree retention area, the width of it should be expanded to include the seep or spring, plus 15 feet.
- Trees immediately adjacent to seeps or springs that otherwise meet wildlife leave tree requirements within timber harvest Type 2 or Type 3 units may be retained.

E Eastern Oregon

- Where a seep or spring occurs in the inner zone of a tree retention area, retain all trees within 15 feet of seeps or springs.
- If the seep or spring does not lie fully within the inner zone of the tree retention area, the width of it should be expanded to include the seep or spring, plus 15 feet.
- Trees immediately adjacent to seeps or springs that otherwise meet wildlife leave tree requirements within harvest Type 2 or Type 3 units may be retained.



A stream-associated wetland and its 25-foot RMA.

Table 3-8 Wetland protection requirements

Class of wetland	Riparian management area (feet)	Area protection required (both wetland & its RMA)
Significant (greater than 8 acres; or estuaries, bogs and certain eastern Oregon springs)	Estuaries 100-200 ¹ Bogs 50-100 ¹ Eastern Ore. springs 50-100 ¹ Wetlands 100	Leave understory plants, all snags and downed wood, and 50% of the trees by species and size ²
Stream-associated (next to a stream)	Stream RMA goes around it ³	Included in stream RMA
Other (fewer than 8 acres)	No RMA	If more than 1/4 acre, leave snags and down wood ⁴ If less than 1/4 acre, no leave tree or vegetation retention requirements
Other (seeps and springs adjacent to streams)	Bump out stream RMA if at the edge	Included in stream RMA

1. Determined by ODF at the time of resource site review.

2. Leave 50% of the original live trees, by species, in each of the following size classes:

- 6-10 inches DBH
- 11-20 inches DBH
- 21-30 inches DBH
- greater than 30 inches DBH

Leave trees should be well distributed. All snags and down wood in the wetland and RMA must be left. Snags felled for safety reasons must be left on the ground and cannot be counted toward snag and live-tree requirements in clearcuts.

3. Where wetlands or side channels extend beyond a tree retention RMA, expand the RMA to include the wetland or side channel, plus 25 additional feet. This applies to all streams or stream segments with tree retention requirements.

4. These can be counted toward requirements to leave snags and down logs in clearcuts.



Other wetlands larger than one-quarter acre, such as this one, do not require a tree retention area, but all snags must be left standing and down wood retained within the wetland.

OTHER RIPARIAN-ASSOCIATED CONSIDERATIONS

Pond construction

Many landowners are interested in developing a pond on their forest property, if one doesn't already exist, both for practical uses and amenity values. On forestland, a pond can attract unique aquatic and wildlife species, and can provide a valuable water source if a wildfire occurs.

Constructing a pond requires a permit application and approval from the Oregon Water Resources Department (OWRD). There is a base permit application fee and an additional fee that varies with the planned size of the pond. Be aware that construction of large ponds (i.e., those with dams over 10 feet high and storage levels over 9.2 acre-feet) requires that a more detailed and costly application, including a design by a licensed engineer, be approved.

Pond development also requires good planning and coordination between the application process and construction work, due to the many details and the amount of time involved. Key steps and timing for the application and permitting process include:

- landowner submits an application and pays the base fee, plus pond-size fees
- OWRD posts a public notice of the application within 60 days
- after this posting, there is a 60-day public comment period
- OWRD issues a permit decision within 180 days



Placing large wood pieces in streams to improve fish habitat

Many fish-bearing (Type F or SSBT) streams in Oregon can be improved by the placement of large pieces of wood that enhance spawning and rearing habitat for fish. Landowners are generally encouraged to make such improvements, and the forest practice rules allow for some flexibility to conduct them.

The purpose of placing large wood in streams is to simulate down trees falling into the stream due to windthrow and other natural processes. The goal is to maintain and restore stream habitat with relatively stable features, although some reconfiguration of the wood is expected with changes in natural stream flow. Stream wood placement projects are often most efficient when combined with other forest operations, and they must meet all applicable forest practice rule requirements, including preparation of a written plan and/or a plan for an alternate practice.

Projects placing large wood in streams should be designed and implemented to:

- rely on the size of wood for stability, and exclude the use of any type of artificial anchoring
- emulate large wood delivery configurations that occur from natural riparian processes over time
- restore and maintain natural aquatic habitat over time, rather than rely on constructed habitat structures
- meet the standards established in *Guide to Placement of Wood, Boulders and Gravel for Habitat Restoration*, developed January 2010 by the Oregon Department of Forestry, Oregon Department of Fish and Wildlife, Oregon Department of State Lands, and Oregon Watershed Enhancement Board, January 2010

See OAR 629-643-0200.

Ponds are an attractive and often useful feature on forestland. Their construction requires an application and permit from the Oregon Water Resources Department.

ALTERNATIVE VEGETATION RETENTION PRESCRIPTIONS

Alternative vegetation retention prescriptions apply in situations where the existing riparian stand is not expected to meet desired future conditions for streamside areas, because of stand composition or damage from catastrophic events. Using prescriptions designed for these circumstances, along with a written plan, management is permitted within the otherwise no-cut tree retention areas to facilitate achievement of desired future conditions.



Alternative vegetation retention prescriptions are described for two different situations:

1. catastrophic events, such as fire, wind, snow and ice, or insect and disease outbreaks
2. hardwood-dominated sites that are capable of growing conifers

If your streamside stand meets these conditions, you can submit a written plan explaining the use of the applicable prescription and how it will help achieve the desired future conditions.

Seven geographic areas are specified in the forest practice rules with corresponding basal area tables.

You may use the rules outlining alternative vegetation retention prescriptions if your riparian area meets the conditions. Note that changes to this section of the rules are expected through the post-disturbance harvest rulemaking process, which will conclude no later than Nov. 30, 2025.

For specifics on using alternative vegetation retention prescriptions in your riparian area, refer to the most current version of OAR 629-643-0300 and discuss it with your stewardship forester.

IMPORTANT NOTE

Significant changes to OAR 629-643-0300, Alternative Vegetation Retention Prescriptions, have been proposed, but had not been adopted by the Board of Forestry at the time of printing. Verify that you are working with the current rule before proceeding with harvest planning and layout.



Mortality resulting from events like pine beetle outbreaks (top) and damaging ice storms (bottom) may justify the use of an alternative vegetation retention prescription.

Desired future conditions for streamside areas

For streamside areas that require forested buffers, the goal is for average conditions across the landscape to be similar to those of mature streamside stands.

Mature stands generally:

- reach maturity around 80 to 200 years of age (varies by trees species and site)
- comprise of multi-aged trees of appropriately varied density, and contain native tree species well suited to the site, a mature overstory, snags, and downed wood

These mature streamside stands provide:

- ample shade over the channel
- abundant large wood in the channel
- channel-influencing root masses along the edge of the high-water level
- regular input of nutrients through litter fall



Alternative riparian vegetation retention prescriptions allow more flexibility in high mortality situations like after a fire to manage the riparian area toward desired future conditions.

SITE-SPECIFIC VEGETATION RETENTION PRESCRIPTIONS

Site-specific vegetation retention prescriptions provide opportunities for restoring or enhancing riparian management areas (RMAs) through active management within otherwise no-cut tree retention areas when the vegetation retention goals and desired future condition for streamside areas can be met or accelerated. Landowners or operators must submit a plan for an alternate practice (PFAP) explaining the management prescription and how it meets the vegetation retention goals for streamside areas. A stewardship forester must review and approve these plans before logging operations can begin.



Placing logs in streams can help enhance riparian management areas to provide better fish habitat.

Site-specific vegetation retention prescriptions can be used if:

- The potential of the streamside stand to achieve conditions similar to mature forest stands in a timely manner is questionable.
- In-stream conditions are impaired due to inadequate large wood or other factors.
- The site-specific prescription would result in less environmental damage than the standard practice.

For details on using site-specific vegetation retention prescriptions in your riparian area, refer to OAR 629-643-0400 and discuss it with your stewardship forester.

A plan for alternate practice will be approved if:

- When properly executed, the alternate plan will have no significant or permanent adverse effects

- Vegetation goals are met or exceeded in a more timely manner than if the plan were not implemented
- Long-term benefits of the plan are greater than short-term detrimental effects or
- The plan will result in less environmental damage than if the standard practice were followed.

Factors used for evaluating the alternate plan include:

- potential of existing streamside stand to achieve mature streamside forest characteristics
- the long-term supply of woody debris
- survival of newly established trees or shrubs
- fish and wildlife species' sensitivity to changes in water temperature and water quality
- the potential for sedimentation

- the stability of wood debris placed in aquatic areas
- the State Forester's ability to monitor the direct effects of proposed practices.

Site specific basal area targets are provided as guidelines for designing alternate practices in each geographic area. Refer to the table for your region and stream type when writing your plan for alternate practice.

Geographic areas

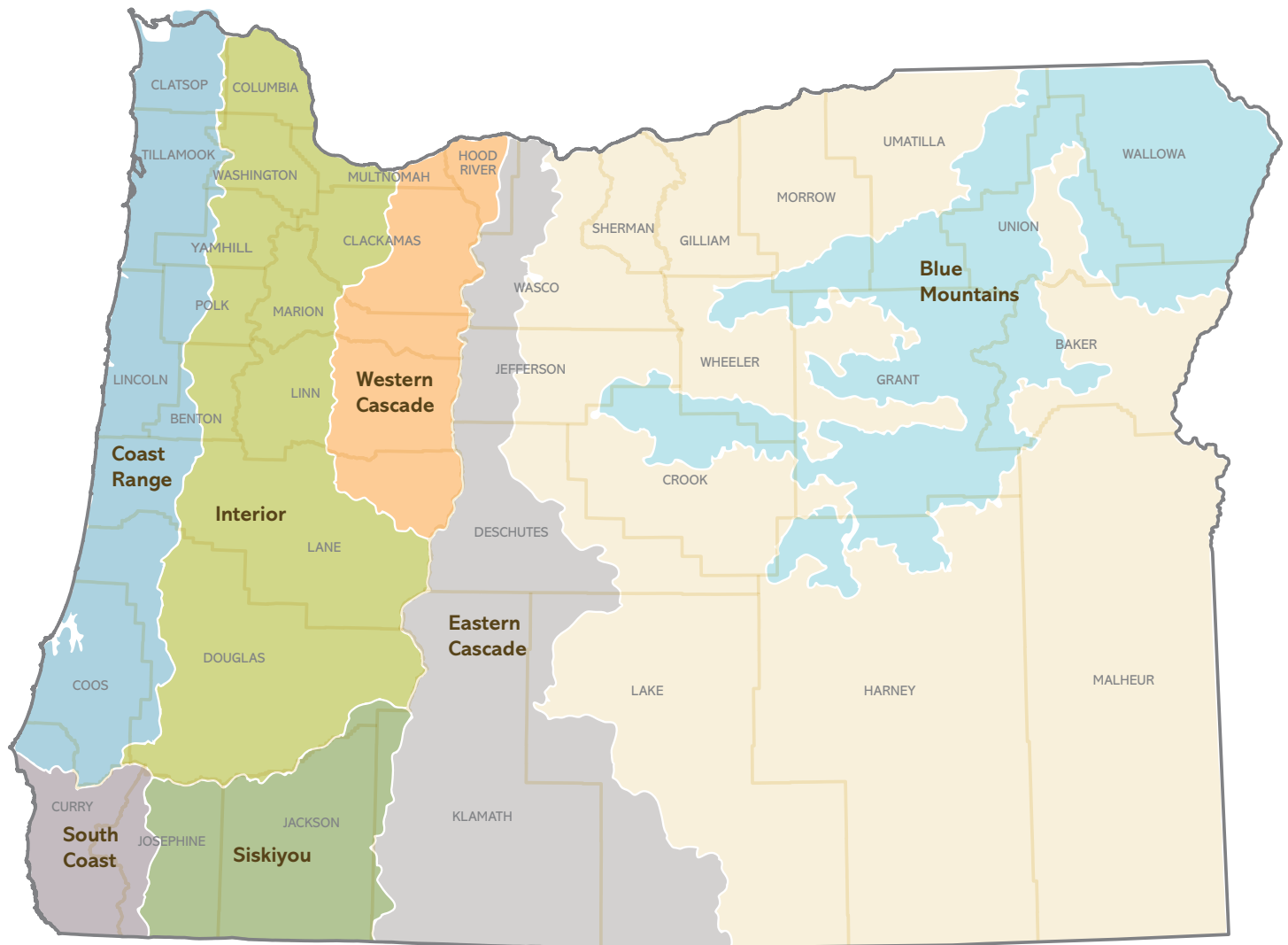


Table 3-9 Site specific basal area targets

Geographic areas	Square feet of basal area per 1000 feet of stream each side		
	LARGE TYPE F	MEDIUM TYPE F	SMALL TYPE F
	RMA = 110 feet	RMA = 110 feet	RMA = 100 feet
Coast Range, S. Coast	253	253	230
Interior & W. Cascades	297	297	270
Siskiyou	242	242	220
	RMA = 30 feet	RMA = 30 feet	RMA = 30 feet
Eastern Cascade & Blue Mountain	51	51	51

STREAM SURVEYS

To apply appropriate riparian protection measures, streams need to be classified and identified on the ground in accordance with forest practice rules. The required information that informs riparian management area (RMA) layout, including fish presence and stream perenniality (see pages 61 and 101 to learn more about perenniality), is available through the Oregon Department of Forestry's (ODF) Forest Practices Act (FPA) Streams and Steep Slopes viewer and in FERNS.

The option to correct modeled information via field surveys will be retained. ODF provides information on the features and classifications against which protections will be enforced, unless surveys are conducted in advance of an operation and in consultation with an ODF stewardship forester. Even once all modeled features are available, it is a good idea to walk the riparian features on your property or harvest unit and decide whether you want to conduct any surveying in advance of operations. The modeled features may not suitably represent what exists on the ground. Changes to stream classification may be made through procedures described in the Oregon Forest Practices Act (OFPA) rules. ODF will provide written notice of stream classification changes if your property immediately adjoins portion(s) of water that will be reclassified.

Field survey types

FISH STREAMS

All streams statewide have been classified for fish use using an approved fish distribution model. Lay out RMAs according to the published stream information in the stream viewer or FERNS. Approved field surveys for fish presence can revise the end of fish use location. Read the following if you have qualifying surveys that are not yet reflected in ODF's stream mapping, or if you would prefer to have a stream field-surveyed for fish habitat and distribution in advance of an upcoming operation. Note that in order to be used for stream classification in the OFPA rules, all field surveys for fish use must be conducted according to the protocol in *Surveying Forest Streams for Fish Use*, jointly published by ODF and Oregon Department of Fish and Wildlife (ODFW).

Field surveys conducted prior to the Private Forest Accord (PFA) enactment

Surveys conducted prior to the PFA enactment may still be included in ODF's streams viewer and in FERNS, if they meet certain criteria. These qualifying field surveys were included in the July 2023 statewide stream layer update.

Field surveys conducted prior to Jan. 1, 2023, and not yet accepted by ODF for purposes of informing

compliance with the forest practice rules:

- may be submitted to ODFW until Jan. 1, 2028
- must meet the requirements of the survey protocol in effect as of the date of the survey
- will be incorporated into ODF's stream mapping and FERNS within 90 days, if not disqualified for failure to meet survey criteria

Use a field survey:

- to validate or revise modeled fish presence
- to determine perenniality before the model is released
- after the perennial model is released:
 - > to correct the modeled end of perenniality
 - > to determine perenniality for a single operation



Field surveys conducted prior to May 1, 2023, and accepted by ODF for informing compliance with forest practice rules:

- may be submitted to ODFW until Jan. 1, 2028
- must meet criteria in PFA report (Feb. 2, 2022)
- will be incorporated into ODF's stream mapping and FERNS within 90 days, if not disqualified for failure to meet PFA criteria

Field surveys conducted after PFA enactment

Field surveys conducted after May 1, 2023, will be entered into ODF's stream mapping and FERNS if:

- the survey is submitted to ODFW and not disqualified within 21 days for failure to satisfy ODFW protocols for fish-use field surveys
- the survey is reviewed and approved by ODFW

Field surveys conducted after May 1, 2023, will be removed from ODF's stream mapping and FERNS:

- if not approved within 21 days for failure to meet requirements of survey protocol in effect as of the date of the survey
- if a forest operation is notified prior to disapproval of the survey, the survey may be used for a notified forest operation that relies on it

If surveys conflict, the survey considered to be higher confidence by ODFW will be used within ODF's reporting and notification system.

Streams initially classified as fish-bearing based on the model released July 1, 2023

The fish presence model will be used to lay out OFPA protections, unless a fish presence survey is conducted.

- Surveys by either the landowner or ODF must be conducted according to the protocol in *Surveying Forest Streams for Fish Use*, jointly published by ODF and ODFW.
- An operator may request a fish presence survey, from ODF 12 to 24 months before an operation's scheduled start date.
- ODF will make a good faith effort to conduct the survey, and landowners who do not have financial or technical resources to conduct surveys will be prioritized.

- ODFW will approve or object to surveys conducted by ODF within 21 days. If no objection occurs, the survey will be accepted, and fish-use designation updated in FERNS.
- If approved by ODFW, the ODF stewardship forester may use other information to determine the upstream extent of fish use.

Exceptions may be made for Type F stream classification above an artificial obstruction to fish passage:

- if documented by a field survey as the end of fish use
- where the obstruction is likely to continue to prevent fish passage for longer than it takes to grow trees that can introduce large wood into the stream system
- Classification above the artificial obstruction will be either Type D or Type N as appropriate, and vegetation retention will be required upstream (see page 75 for an inline example, and page 85 for Type D designation).

SALMON, STEELHEAD AND BULL TROUT STREAMS (TYPE SSBT)

Streams inhabited by salmon, steelhead and bull trout (Type SSBT) are broadly defined as streams with SSBT fish use. The process to determine or update SSBT use is found in OAR 629-635-0200(12-13). The addition of SSBT-specific protection was part of an update to the OFPA rules effective July 1, 2017, and the definition of an SSBT stream was updated as part of the PFA in 2022. Classification of SSBT streams in your Area of Inquiry may have changed as a result of PFA updates, so be sure to review ODF's streams mapping.

FLOW DURATION OR PERMANENCE ("PERENNIALITY")

Flow duration or permanence, also known as "perenniality," is now an important component of stream typing and laying out protection on small Type N streams (Type Ns and Type Np). Determination of the key points that define timber harvest unit layout will require field surveys until a modeled end of perenniality is added to ODF's stream maps. During Phase 1, landowners must either survey streams according to an operational field protocol or apply the highest level of protection for small Type N streams, essentially treating all small Type N streams as perennial (Type Np). Note that if you are not planning a harvest, there is no need to survey your streams. The information gathered during a flow duration or permanence survey is specifically used to lay out RMA protections during a timber harvest. Phase 2 will begin when the model of perenniality is released.



Example of a seasonally dry stream channel with distinct scour bed and banks.

Phase 1 – Initial mapping

During Phase 1, high-resolution data from the U.S. Geological Survey (USGS) National Hydrography Dataset (NHD) is used to map streams. Flow duration is included in ODF streams mapping, but there is no modeled end of perennality (EOP). This means that within the ODF FPA Streams and Steep Slopes Viewer, stream segments are labeled as seasonal or perennial, but these labels are for information only. Until modeled EOP is available (Phase 2), or a survey is conducted that shows otherwise, all small Type N streams will be treated as perennial during harvest layout.

Operational field surveys can be conducted during Phase 1 without advance notification to ODFW. They can also be conducted at any time of the year, but it is most practical to complete them during low flow season in mid-to-late summer. Surveys completed during the low flow period established by ODFW may be incorporated into the flow duration modeling for Phase 2.

Operational field surveys may be completed using low or geospatial-based precision:

- Low precision requires a set of points located and marked on the ground to be recorded in a spreadsheet that is submitted to ODF.
- Geospatial-based surveys do not require additional field effort, but you will need to submit geospatial file formats (e.g., shapefiles, kmz/kml, etc.) with the required spreadsheet information as file attribute tables to ODF.

Lower-precision data is allowed in Phase 1, but may only be used to lay out protections for a single operation and will not be included in ODF's streams mapping or FERNs. In addition to being used to lay out the current

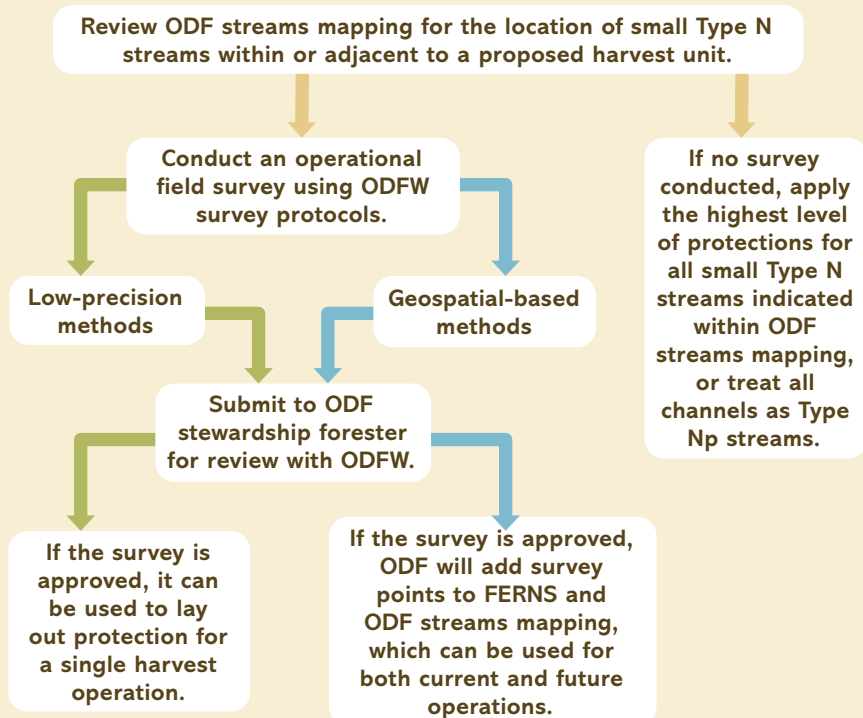
harvest boundary, data collected using geospatial methods will be used to update ODF's streams mapping and FERNs and, if collected during the low flow period, may be used to inform development of modeled EOP.

Completed operational field surveys (flow permanence surveys) need to be submitted by email to your ODF stewardship forester, including all the necessary attachments and files containing attributes and information required by the survey protocol. Stewardship foresters consult with ODFW to review all operational field surveys. Approved low-precision surveys and any surveys not receiving a review within 21 days may be used to lay out protections for a single harvest unit. Only approved surveys using geospatial-based methods will be added into ODF's streams mapping and FERNs, and used to lay out riparian protections in the future.



The flow feature extent (FFE), shown appropriately marked according to the survey protocols (permanent tree marking paint optional), is the upstream end of flowing water greater than 25 feet in length within a distinct stream bed and banks. In Phase 1, the only FFE point required is at the uppermost FFE, which is considered the end of perennality.

Phase 1 process simplified



Terms to know:

When a Type Ns stream becomes a Type Np stream

Between the Forest Practices Act rules, Forest Practices Technical Guidance, and stream survey protocols, there are several ways of referring to the point at which a Type Ns stream becomes a Type Np stream. This point is consequential because it determines the application of RMA protections. Here are some key terms to know when it comes to referencing changes in stream type:

END OF PERENNIALITY – the point at which water that flows year-round in a channel ends; discussed in the sidebar on page 61

VERIFIED END – a modeled end that is field-verified by ODFW during Phase 2

MODELED END – a point identified using a model of stream perennality. Availability of modeled end data in FERNS marks the beginning of Phase 2.

OPERATIONAL FIELD-SURVEYED END – a point established through a field survey conducted by a landowner according to ODFW protocol

UPPERMOST FLOW FEATURE WITHIN THE AREA OF INQUIRY – a point used specifically for and located during an operational field survey conducted according to ODFW protocol

UPPERMOST FLOW FEATURE EXTENT – the top or end of the farthest upstream flow feature, which is marked “FFE” in the ODFW operational field survey protocol

FLOW DURATION OR FLOW PERMANENCE – another way of referring to perennality, which means the duration of stream flow throughout the year

Phase 2 – Model

Phase 2 begins when the flow permanence model becomes available. During Phase 2, operational field surveys will no longer be required to identify the end of perennality (EOP). Key points to lay out riparian area protections will be available within ODF's streams mapping and FERNS. Landowners may still choose to conduct a survey as a routine practice in advance of harvesting, or if the stream model does not accurately reflect field observations in a planned harvest unit.

Updated survey protocols will be published once Phase 2 is implemented, with additional restrictions based on data collected in drought or abnormally wet years. During drought years, the uppermost upstream flow feature within the Area of Inquiry (AOI) will be the longer of the modeled end or the uppermost flow feature within the AOI. In an abnormally wet year, the AOI stops at the modeled stream end.



Right: The channel initiation point (CIP), visible in the lower right-hand corner of the the image and shown appropriately marked according to the survey protocols (permanent tree marking paint optional), is the most upstream location where a discernable channel with a stream bed and banks is observed, whether it contains flowing water or not.

Approved surveys will be used to update the modeled end with the operational field-surveyed EOP. ODFW may conduct field surveys in Phase 2 to verify the modeled end (creating a verified end), but these are distinct from operational field surveys.

The protocol is provided by ODFW for Phase 1 until modeled flow permanence information is available through ODF. Refer to *Small Type N Stream Guidance and Flow Permanence Field Survey Protocol*, which is available on **KnowYourForest.org/manual-links**.

Tips for operational field surveys:

- When beginning a stream survey, start from the farthest downstream point on the property or within the timber harvest unit and proceed upstream. While it may be most convenient to survey a stream from top to bottom (usually due to the access point or steepness of the unit), protections are laid out upstream from a confluence. You can end up finding a channel or water above the Area of Inquiry and spending time on a stream segment that is not consequential to laying out RMA protections.
- If a confluence with a Type F or Type SSBT stream does not occur within your unit, but is inside your property, starting a survey there makes the most sense for laying out protections. If the confluence is on a neighboring property, it is worth asking for permission to begin a survey there.
- If the harvest unit you are surveying for is only around small Type N streams that are more than 1,150 feet (westside) or 750 feet (eastside) upstream from a confluence with a Type F or Type SSBT stream, the streams within the unit do not require a tree retention area. A survey in this case only establishes perenniality (EOP) to determine whether an equipment limitation zone (ELZ) or retention-equipment limitation zone (R-ELZ) is required on the small Type N stream segments. If you have multiple planned harvest units to survey, this unit would be a lower priority.
- Small Type Np streams flowing into medium or large Type N streams are not included in the definition of the Area of Inquiry and thus are not required to be surveyed. Protections on these streams is only an ELZ. This is true even if the cumulative upstream distance (including the medium or large Type N segment) from a Type F or SSBT stream is less than the RH max.
- A specific color of flagging or marking paint is not indicated in the survey protocol, but the best practice is to make it uniform across harvest units and distinct from all other marking used for property boundaries and harvest unit layout.
- For geospatial-based surveys, ODFW created a template geodatabase to facilitate the collection of data that can be used to update the model. It can be downloaded at ODFW's Private Forest Accord web page and used as a template for submission to ODF/ODFW.
- For low-precision surveys, ODFW created a template Excel spreadsheet that can be used to report flow permanence on streams for a single operation. It can be downloaded at ODFW's Private Forest Accord web page and used as a template for submission to ODF/ODFW.
- Flow features may be found above the Area of Inquiry (AOI). If a flow feature is found above the AOI, it does not require additional protection (R-ELZ or tree retention) beyond an ELZ. Perennial stream protections are only required around flow features found within the AOI (within 250 feet of the last flow feature). The uppermost point of the last flow feature within the AOI becomes the EOP, and the stream above it is considered seasonal, even if there are some apparently perennial stretches above the 250 feet of non-flowing stream bed.
- It will be helpful to discuss, and possibly set up a site visit, with your stewardship forester to review any unclear field situations and ensure you are meeting the forest practice rule requirements.
- If you have multiple harvest units to survey, prioritize those that will be impacted most by survey results. This would include harvest units with Type F or Type SSBT streams within or near the unit, Type N streams that become fish-bearing at a point within or near the unit, and all non-fish-bearing streams entering a fish stream at a confluence.
- Recall that protections for small Type N streams are laid out upstream beginning at a confluence between two different stream types. This includes inline stream type changes. Even if a harvest unit contains no fish-bearing streams, a type change or confluence that is downstream but nearby — within 1,150 feet (westside) or 750 feet (eastside) slope distance — could impact layout of stream protections in the unit.



Examples of perennial stream flow within subtle-but-distinct scour bed and banks with hydrologic connectivity to perennial or fish-bearing streams.

