PLANNING A TIMBER HARVEST

You want to harvest timber on your property. How do you plan for it?

What can happen when you don't know the requirements?

"A logger harvested the trees on my property last year. Now I've got a letter from the Oregon Department of Forestry (ODF) telling me I'm required to replant the harvest unit. I've got two years to do the planting, and then four more years to take care of the seedlings. I didn't know about this. I figured the trees would come back on their own. It's going to cost a lot and I used the money from the harvest for something else. If I'd known about all of this before I would have done things differently."

Signed, Uninformed Forest Landowner

How can you prevent this from happening to you?

When you harvest timber or sell or purchase cut-over land, you have a legal obligation to know whether you need to reforest. Sellers of land with reforestation requirements have an obligation to inform potential purchasers about the reforestation responsibility. This obligation goes with the land to the new landowner. The processed E-Notification of Operations includes a notice to the landowner: "Reforestation may be required after timber harvest."

Is there flexibility?

It's your decision to choose between four broad types of harvest (Table 2-2, page 17) and how much timber to harvest on your property.

Your decision will determine if you need to reforest, limit the harvest unit size, or leave wildlife trees and down logs to meet the requirements.

Forest landowners also must protect streams, lakes, wetlands and wildlife sites. These topics, along with harvest slash disposal and forest fire regulations, are discussed later in this manual.



The following pages describe the steps forest landowners can go through to plan timber harvests on their properties. The examples show how the Oregon Forest Practices Act and Rules consider different scenarios and offer flexibility.



Are you a landowner ready to harvest some timber?

Perhaps your goals can be described this way:

You need to sell some timber for some income. You want to thin your trees, but you want what's left to be a healthy, vigorous forest.

Maybe you have the information called for in Steps 2, 3 and 4. You've identified the site class for the harvest unit, the size of the unit and which trees you'll leave. For example:

The harvest unit is Site Class III, the "high" category. Harvest size: 35 acres.

The plan: leave 90 square feet of basal area per acre in trees at least 11 inches in diameter. See this harvest unit on page 15.

Are steps 2-4 new to you?

Be sure to check out information in the appendix. You can learn how to determine this information, but some landowners hire a professional forester for help.

Follow these steps to know what your timber harvest requirements will be

STEP 1

Determine the kind of harvest (Type 1, 2, 3 or Unclassified) you intend to conduct (Table 2-2, page 17).

Do this before you submit your E-Notification of Operation using FERNS to ODF.

To do that you need to know three things:

- · the harvest unit site class
- the harvest unit acreage
- the diameters and basal area of the trees you will leave

STEP 2 Determine the site class of your harvest.

Tree growth on Oregon's forestland varies with our changing climate and different soil conditions. Site class is a measure of forestland productivity. Several important requirements in the Oregon Forest Practices Act are based on site class.

For purposes of the Oregon Forest Practices Act, forestland site classes are grouped into three categories:

- Site classes I, II and III are the high category.
- Site classes IV and V make up the medium category.
- Site class VI makes up the low category.

Be careful not to confuse site class with site index, which is a measure of how tall trees will grow at a particular location. For more information on site class and how to determine it for your harvest unit, see the Appendix, page 145. The E-Notification of Operations system provides several types of base maps to draw and edit your boundary and calculate the unit acreage.

STEP 3

Determine how many acres the harvest unit will cover.

Harvest unit size determines whether some important restrictions apply. First there's the requirement to leave wildlife trees and down logs on Type 2 harvest units larger than 25 acres. Then there's the requirement to limit Type 3 harvest units to 120 acres, with a few exceptions. As you go through this example you'll understand why knowing your harvest unit size is important. You can figure out the size of your harvest unit using a scaled aerial photograph, topographic map or global positioning system. Accurate acreage measurements are your responsibility. The E-Notification of Operations system provides several types of base maps to draw and edit your harvest unit boundary and calculate the acreage.

STEP 4

Determine the diameters and basal area of the trees you will leave on the harvest unit.

This is where you decide and measure which trees you plan to leave in the harvest unit. Tree diameter is measured 4-1/2 feet above the ground, on the uphill side of the tree, and is referred to as diameter at breast height (DBH). Basal area is the cross-sectional area of each tree stem at DBH, for a specific area such as an acre.

How much basal area you leave and the diameters of the leave trees are two of the keys to determining the type of harvest you intend and the requirements that will apply to the harvest unit. See the Appendix, page 156 for more information on measuring tree diameters and calculating basal area.

STEP 5

Determine if the operation is likely to be active during a "declared fire season."

A "declared fire season" exists when the local risk of wildfire is identified as significant, a period often extending from early July to October. During this time, operators are required to be alert and able to suppress a small fire, including having suppression equipment on-site and meeting daily firewatch requirements, as well as having additional liability for a fire originating in the harvest unit. See pages 85-90 for more information.

STEP 6 Determine if a written plan is required.

Written plans are required to protect streams, wetlands, bird sites and public safety. Sometimes the requirements for a written plan may be waived. See pages 6 and 143. Your harvest unit example:

Site Class III, high; Harvest size, 35 acres, leaving 90 sq. ft./acre in 11" or larger trees.



You now need to answer these questions:

Question 1

How much of this forest will be harvested, and will there be a reforestation requirement after harvest?

Question 2

Will there be a requirement to leave wildlife trees and down logs when harvesting?

Question 3

Will the harvest unit be Type 1, Type 2, Type 3 or Unclassified? The answer to this question is needed to help answer Question 2 and determine if the size of the harvest unit must be limited to 120 acres.

Question #1 rephrased:

After the harvest, will the stocking of seedlings, saplings and poles, and trees 11 inches and larger in diameter, meet the standards for reforestation for Site Class III forestland? The standards are different for each site class; see Table 4-1 on page 77 to find the standards for all site classes. From that table you can see that Site Class III reforestation rule standards are:

Plant or retain 200 seedlings per acre (see sidebar)

Or

Retain 120 saplings and poles per acre (see sidebar)

Or

Retain 80 square feet of basal area per acre in 11 inch DBH and larger trees

Or, as described on page 78:

Landowners can decide to plant or leave an "equivalent combination" determined by the "equivalent calculation" formula

An answer to question #1:

Although your forest could be clearcut, you've decided to first thin your trees to provide some income and improve the growth and vigor of the remaining stand. You plan to leave at least 90 square feet of basal area per acre in 11-inch DBH or larger trees. With this decision, you will meet or exceed the reforestation rule standard for Site Class III forestland. No reforestation, which usually involves planting seedlings, will be required.

What are seedlings?

Live trees of acceptable species of good form and vigor with a DBH of less than one inch.

What are saplings and poles?

Live trees of acceptable species of good form and vigor, with a DBH of one to ten inches

Question #2 again:

Will you need to leave wildlife trees and down logs? (See more about wildlife trees, snags and down logs on page 38.)

An answer to question #2:

If you had planned a harvest of 25 acres or less, wildlife trees, snags and down logs would not be required. However, if you needed a bit more income this year to cover some expenses, you might consider a harvest of about 35 acres. You now need to determine if the trees you intend to leave after harvest will meet or exceed the standards in Table 2-1.

Your plan is to keep as much as 90 square feet of basal area per acre in trees 11 inches or larger. That is higher than the Site Class III reforestation standard of 80 square feet. By doing that, you are not required to leave wildlife trees and down logs, but you could plan to leave some.

Question #3 again:

Will the harvest unit be Type 1, Type 2, Type 3 or Unclassified? The answer to this question is needed to help answer Question 2 and determine if the size of the harvest unit must be limited to 120 acres.

An answer to question #3:

You can use Table 2-2, on page 17 to determine your type of harvest. You have a vision of how the forest will look after harvest, and it seems to match the illustration and description for the Unclassified category. An Unclassified harvest has no requirement for reforestation or wildlife trees. The Unclassified category matches your planned harvest, and perhaps the following statement also fits:

Table 2-1 Leave Trees and Site Class

When planning a harvest over 25 or more acres: leave the amounts in columns 2 or 3, or leave at least two wildlife trees and two down logs per acre.

Site class	# Trees per acre at least 11 inches at DBH or	Square feet of basal area per acre in 11-inch or larger trees
I, II and III	50	33
IV and V	30	20
VI	15	10

"My goal was to make some money to pay some expenses this year. I wanted to thin out the stand, but also keep a lot of trees. I want them to keep growing and they give the property a nice feel. I figured out I could do what I wanted by leaving enough trees to make up at least 80 square feet of basal area per acre."

What if?

What if you changed your harvest goals and decided to remove most of the trees, leaving some scattered trees that add up to about 10 square feet of basal area per acre? And, because your stand was very dense to begin with, not many saplings or seedlings will remain after harvest.

- In this case, you'll see that the trees that will be left after harvest will be less than the reforestation stocking standards for Site Class III forestland; therefore, reforestation would be required.
- You'll also see that there will be less than 33 square feet of basal area and the harvest unit size is more than 25 acres, so wildlife trees and down logs will have to be left (see Table 2-1).
- Finally, look at the illustrations and descriptions in Table 2-2. Type 2 and Type 3 might match these changed harvest goals. Because both reforestation and wildlife trees are required, it must be a Type 3 harvest.

• Type 3 harvests have one more restriction: They are limited to 120 acres unless ODF reviews a written plan for an exemption before logging.

Is there more to know about wildlife trees and down logs requirements?

Leave at least two wildlife trees and two down logs per acre. Items 1, 2 and 3 below offer a brief overview. Details are on pages 38-40.

- 1. Green trees or snags, left for wildlife, must be at least 30 feet in height and 11 inches DBH or larger and at least 50 percent must be conifers.
- Down logs or down trees must be 50 percent conifer and at least 10 cubic feet gross volume, no less than 6 feet long. One downed conifer or hardwood log, at least 20 cubic feet gross volume and no less than 6 feet long, may count as two logs.
- 3. Wildlife trees and down logs may be left in one or more clusters rather than distributed throughout the unit.

What is the take-home message?

- It is to the landowner's advantage to preplan a timber harvest.
- It is to the landowner's advantage to know the harvest type in advance.
- Landowners need to know the harvest type to understand the reforestation and riparian management area requirements.

Table 2-2 Four Types of Harvest and Their Requirements

TYPE 1 HARVEST

Heavy thinning or shelterwood – few or no seedlings, saplings or poles remaining.



- Does not meet reforestation stocking standards.
- Must plant within two years and have "free-to-grow" seedlings within six years.**
- No wildlife trees or down logs are required if adequate basal area of 11" trees or larger is left (see Table 2-1).

TYPE 2 HARVEST

A clearcut in which the required seedlings, saplings and poles are left. The number of large trees is below Table 2-1 requirements.

Requirements for <25 acre harvests

- meets the reforestation stocking standards.
- no reforestation required.

TYPE 3 HARVEST

A clearcut, where few seedlings, saplings or poles remain. The number of large trees is below Table 2-1 requirements.

Requirements for <25 acre harvests

- Does not meet reforestation stocking standards.
- Must plant within two years and have "free-to- grow" seedlings within six years.**

Requirements for >25 acre harvests

- Leave two wildlife trees and two down logs per acre.*
- No reforestation required.



Requirements for >25 acre harvests

- Leave two wildlife trees and two down logs per acre.*
- Subject to 120-acre size limitation.
- Must plant within two years and have "free-to- grow" seedlings within six years.**

UNCLASSIFIED HARVEST

Commercial thinning to space remaining trees or light partial cut.



- Meets the reforestation stocking standards.
- No reforestation required.
- No wildlife trees or down logs are required if adequate basal area of 11" trees or larger is left (see Table 2-1).

*See more about wildlife trees and down logs on pages 38-40. **See full details about reforestation requirements on pages 75-83.

PLANNING A TIMBER HARVEST 17

More about harvest size

1. COMBINED TYPE 3 HARVEST UNITS

When a Type 3 harvest unit is within 300 feet of another Type 3 harvest unit on the same ownership, the combined acreage of the two units must not exceed 120 acres. However, this requirement does not continue forever. The acreage of an existing Type 3 harvest unit will not be included in the total once it meets the following standards:

The number of trees per acre required by the reforestation rules is present, and either:

- the trees are at least four feet tall; or
- the unit was planted or seeded at least four years ago and the stand is "free-to-grow" (see page 76 for definition of free-togrow)

2. TYPE 2 OR 3 HARVESTS NEXT TO PREVIOUS TYPE 2 OR 3 HARVESTS

Wildlife leave trees and down logs must be left on any combination of contiguous Type 2 or 3 harvests over 25 acres on the same ownership, even if the individual harvests are less than 25 acres. For example, if a landowner harvests a 15-acre unit one year and 15 acres next to it two years later, wildlife trees and down logs would be required for the entire 30 acres when the second unit is harvested. They could be provided in either or both units. A landowner who did not leave them in the first unit would need to leave enough for both units in the second one.



Previous Type 2 or 3 harvest less than four years old



For other information sources, see the Appendix, pages 197-198.

You want to harvest timber along a stream. What do you need to know?

This section is a step-by-step process to help you plan for and meet the water protection requirements for fish, wildlife and water quality while harvesting along a stream. This is a complicated part of the Act, but it also allows for flexibility to accommodate different situations. Be sure to read: "How waters of the state are classified and protected," pages 8-12, before proceeding.

When your plan is complete, be sure to review the protection requirements that apply when conducting your harvest. They include: "What you should know when felling, bucking and limbing trees near water," page 55; "What you should know when cable logging near water," page 67; "What you should know when ground yarding near water and using temporary crossings," page 57; and "What are the requirements for log landing," page 68.

Question 1

Do you know the geographic region of your harvest? For more details, see page 10.

Question 2

What is the stream size? For more details, see page 8.

- small
- medium
- large

Question 3

Do you know what type of stream is in the harvest area? For more details, see page 8.

- Type F has fish use, may also be used for domestic water
- Type SSBT small or medium Type F streams that have salmon, steelhead or bull trout (SSBT) use
- Type D used for domestic water, no fish use
- Type N neither fish use or domestic water use

Most medium and large streams are likely to be Type F. Remember, operations within 100 feet of a Type F, SSBT or D stream require a written plan. See the Appendix, page 143, for an example. Sometimes a stream segment is Type F, Type SSBT and Type D. Always apply the higher stream vegetation protection requirement when there is more than one Type on a stream segment.

Question 4

What type of harvest do you plan to conduct along the stream?

- Type 1
- Type 2
- Type 3
- Unclassified

If you don't know your harvest type, read: "You want to harvest timber on your property. How do you plan for it?," on page 13. It's important to determine the harvest type and how much stocking will be left after your harvest, or you risk violating tree retention requirements. Know your harvest type before proceeding.

Question 5

What length of stream is affected by your planned harvest?

Either measure its length in the field or figure out the lineal feet of affected stream from a scaled aerial photo or topographic map.

Question 6

How should you mark the Riparian Management Area (RMA)?

If you're not familiar with RMAs, read: "How waters of the state are classified and protected," pages 8-12.

Once you know your stream type and size, check Table 2-3 for the RMA width that's required. You should mark the RMA boundary generally parallel to the stream. Use flagging, marking paint or signs, at intervals frequent enough to avoid confusion during logging.

Table 2-3 Riparian Management Area Widths (for each side of a stream)						
Stream Size	Type F	SSBT	Relief SSBT	Type D	Туре N	
Large	100 feet	-	-	70 feet	70 feet	
Medium	70 feet	80 feet	70 feet	50 feet	50 feet	
Small	50 feet	60 feet	50 feet	20 feet	Specific protection measures (see Table 2-16)	

Note: SSBT requirements only apply to Type 2 and 3 harvests.

Question 7

How much live conifer basal area is in the RMA?

Once you know how much live conifer basal area is in your RMA, you'll know which trees can be harvested and which you must leave. You don't need this information for small Type D or small Type N streams, which have different protection requirements that are described on page 30.

Note: Basal area to be left for Type SSBT streams is based on total basal area (including hardwoods) not just conifer basal area.

Measure the basal area of live conifers 6 inches DBH and larger inside your marked RMA. Page 156, "How to know the basal area of your harvest, reforestation area or RMA," describes the procedure.

As you go through the following example, you will learn that you may need to gather additional information while measuring basal area, including:

- the numbers, diameters and species of the hardwoods
- the size of conifer snags and down conifer logs

This information could be important, as you will see on page 24.

Here are a few examples:

Example 1 - Type F Stream

You are planning a Type 3 harvest, 1,500 feet long, along a large Type F stream. It's located in the Interior geographic region, one of the seven water protection regions in the state.

Because the harvest will occur within 100 feet of a Type F stream, you'll need to prepare a written plan for ODF. We'll discuss that later in this section (see page 33). First, let's handle the key planning questions and decisions.

1. How wide should the RMA be?

From Table 2-3, a 100-foot-wide RMA for each side of a large Type F stream needs to be marked.

2. How is the RMA measured?

Measure the RMA as a slope distance from the high-water level of the main channel to the boundary.



What is the high-water level? This is also called the average yearly high flow (not the highest flood flow level). It's where trees and other yearround plants start growing. On many streams, it's the upper edge of the stream bank.

3. While marking this RMA boundary, you find a stream associated wetland (see page 8) connected to the stream. What protection is needed for this water body?

Where wetlands or side channels extend beyond the RMA, expand the RMA to include the wetland or side channel plus 25 additional feet. This does not apply to small Type N streams.



Notice in the illustration on page 21 how the RMA boundary includes the stream-associated wetland.

4. There is also a steep slope next to the stream channel in the RMA. How is this situation handled?

In the case of steep exposed soil, a rock bluff or talus (loose rock) slope, 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. (See illustration on page 21.)



Stream-associated wetland (see page 8)

How to identify a side channel:

Most side channels carry water only when the main channel is full. Exposed river rock or channel bedrock is rare. Commonly, permanent plants grow in side channels.

Side channel

5. If you're interested in harvesting some trees from the RMA, you need to measure the RMA basal area. How is this done?

If you don't know how to measure basal area for the RMA see the instructions on pages 156-159.

For this example, you found that the 1,500-foot RMA had 450 square feet of basal area of 6-inch DBH or larger conifers.

6. To see what may be available for harvest, you need to know if the basal area is more or less than the standard target for a large Type F stream. What is this value?

Table 2-4 on page 23 shows that the standard target requires a basal area of 270 square feet per 1,000 feet of stream for a Type 2 or Type 3 harvest in the Interior region. The standard target is the minimum basal area required for the RMA. Note that it changes with stream type, size and region.

In this example, the RMA is 1,500 feet long, so the adjusted standard target is 405 square feet of basal area for the entire RMA (1,500 feet/1,000 feet x 270 = 405). Most RMAs will be more or less than 1,000 feet, so the standard target must be adjusted. The 450 square feet of basal area in the RMA

Read this if you want to know what's coming in the next few pages.

- If the basal area of live conifers in the Type F RMA is more than the standard target, landowners can use the general prescription for Type F streams when harvesting in an RMA. This requires leaving enough basal area to meet the standard target, and is described under item 8 on page 23 and in the Appendix, page 156.
- If the basal area of live conifers in the Type F RMA is less than the standard target but still greater than half the standard target, the general prescription for Type F streams still applies, except that landowners must leave the number of trees noted in Situation A on page 24.
- If the basal area is less than half the standard target in the Type F RMA, landowners may be able to use alternative prescription 1 for damaged stands, alternative prescription 2 for hardwood stands, or the default standard. These prescriptions are described on pages 25 and 26.

is more than the adjusted standard target of 405 square feet, so you have the option to harvest trees in the RMA (continue for details).

7. With some RMA basal area available for harvest, what else should be considered?

The general prescription for Type F streams can be used when the RMA has more basal area than the standard target. The general prescription calls for the following to be left in the RMA:

- all trees within 20 feet of the high-water level
- all trees in the RMA that lean over the stream
- all understory vegetation (small trees, brush and smaller plants) within 10 feet of the high-water level
- all snags and down wood in the channel and RMA; any safety or fire hazard snags may be cut, but can't be removed

Exception: Trees and other vegetation may be removed as needed for planned stream crossings or cable yarding corridors (see page 57).

• Enough live conifers 6 inches DBH and larger are required to meet the standard target basal area for the RMA. Hardwoods and snags may count toward the standard target in some cases (see Tables 2-5 and 2-6). Follow this example through for more details.

In some cases the standard target might be met with a few very large trees. However, this could result in large openings with reduced stream shade or an understocked stand. To avoid large openings, landowners must leave a minimum number of live conifers, depending on stream type and size (see below for details):

- Large F: 40 per 1,000 feet, minimum 11 inches DBH
- Large D and N: 30 per 1,000 feet, minimum 11 inches DBH
- Medium F: 30 per 1,000 feet, minimum 8 inches DBH
- Medium D and N: 10 per 1,000 feet, minimum 8 inches DBH
- Small F, D, and N streams: No minimum tree numbers
- For live conifer requirements for Type SSBT see Tables 2-8 and 2-9



8. Where should trees be left in the RMA?

You must leave all trees that lean over the stream and all trees within 20 feet of the stream. After that, you can choose which trees to leave, as long as they meet the basal area standard target and the required minimum number. For the benefit of fish and wildlife, you are encouraged to leave:

- trees distributed throughout the stream length for shade and other resource functions
- trees close to the channel that help stabilize the stream bank
- open-grown trees with large limbs and full crown that serve as wildlife habitat

9. Bottom line: What can be harvested from this RMA?

With 450 square feet of basal area and a required 405 square feet to be left in the Type F RMA, you can remove live conifers that add up to 45 square feet (450-405) as long as the other requirements are met. For example, if the live conifers average 20 inches DBH, about 20 of them could be harvested (see the Appendix, page 156). You can also remove hardwoods that are outside the 20-foot zone. The stream and RMA must be protected with any of the harvesting work (See requirements for working near streams, pages 55-62).

10. In Table 2-4, the Active Management Target is lower than the Standard Target. What situations allow for more harvesting in the Type F RMA using this lower target?

Some streams can benefit from habitat improvement work, such as placing logs or trees in the channel to create pools or hiding cover for fish. It can also mean constructing fencing or off-channel watering sites to keep livestock away from streams, or other work. For streams that can benefit from such projects, landowners who do stream improvement work may be able to harvest more trees under the active management target.

Here's how to use this option. First, have enough basal area to meet the standard target and enough trees to meet the general prescription requirements. Then, with a written plan reviewed by ODF, agree to contribute logs or boulders to the stream (see "For other information sources" at end of this section). Keep in mind that it's possible to use logs from the RMA or logs from the harvest unit to put in the stream, and at the same time reduce the RMA basal area to the active management target level.

	Square Feet of Basal Area per 1,000 feet of Stream, Each Side						
Geographic Region	Large Type F RMA = 100 feet		Medium Type F RMA = 70 feet		Small Type F RMA = 50 feet		
	Standard Target	Active Management Target	Standard Target	Active Management Target	Standard Target	Active Management Target	
Coast Range & S. Coast	230	170	120	90	40	20	
Interior & W. Cascade	270	200	140	110	40	20	
Siskiyou	220	170	110	90	40	20	
E. Cascade & Blue Mountains	170	130	90	70	50*	50**	

Table 2-4 Streamside Tree Retention for Type F Streams with Type 2 or 3 Harvest

* The maximum live conifer basal area that must be left is 40 square feet. The other 10 square feet may come from snags, dying trees or hardwood trees if available in the RMA.

** The live conifer basal area may be reduced to 30 square feet for the active management target. The other 20 square feet must come from snags, dying trees or hardwood trees if available in the RMA.

Table 2-5 Hardwood, dead and dying trees or snags in the RMA that can count toward basal area targets for west-side Geographic Regions

Type F Streams Coast Range, S. Coast, interior, Western Cascades and Siskiyou Geographic Regions	Large	Medium	Small
Cottonwood & Oregon Ash (6 inches or greater DBH) left in the RMA and growing more than 20 feet from the high water level may count toward basal area target	Х		
A combination of the following can make up to 10 percent of the basal area target:	Х	х	Х
1. The basal area of hardwoods (except red alder) retained in the RMA that are greater than 24 inches DBH and grow more than 20 feet from the high-water level			
2. The basal area of sound conifer snags (6 inches or greater DBH and at least 30 feet high) that are anywhere in the RMA			

Table 2-6 Hardwood, dead and dying trees or snags in the RMA that can count toward basal area targets for east-side Geographic Regions

Type F Streams E. Cascades and Blue Mountains geographic regions	Large	Medium	Small
All live hardwoods (6 inches or greater DBH) left in the RMA may count toward the basal area target	Х	Х	Х
Sound conifer snags (6 inches or greater DBH and at least 30 feet high) left in the RMA may count toward as much as 10 percent of the basal area target	Х	Х	Х
No more than 40 sq. ft. per 1,000 feet of the standard target or 30 sq. ft. per 1,000 feet of the active management target is required to be live conifers. The remaining basal area required may come from the following, if they are 6 inches or greater DBH: retained snags, dying or recently dead trees, or hardwoods if they are available			Х

11. Can some logs be placed in the channel for stream enhancement, even if you don't choose to harvest more trees under the active management target?

Yes. If log placement is part of the current forest operation and a written plan, state and federal permits are not required. This approach is one of the easiest ways to do an enhancement project, but be sure to check with your local ODF office before starting log placement work.

12. There are some hardwoods and snags in the Type RMA. Can any of these be left instead of conifers to meet the Type F RMA requirements under the standard target?

Yes, with some limitations. The basal area of certain hardwood trees, dead or dying trees, or snags can make up a portion of the basal area standard target. See Table 2-5 for west-side and Table 2-6 for eastside geographic regions. This is why you will want to record the number, diameter and species of some hardwoods, along with the size of conifer snags as you measure the basal area of your RMA.

13. Hardwoods are common in many riparian areas, so what happens if the RMA conifer basal area is found to be less than the standard target?

The Type F RMA requirements are based on two possible situations:

- Situation A: The live conifer basal area is less than the standard target but greater than half the standard target.
- Situation B: The live conifer basal area is less than half the standard target.

Situation A: The live conifer basal area is less than the standard target, but greater than one-half of the standard target.

As noted earlier, you must still leave trees within 20 feet of the high-water level, trees that lean over the stream, understory plants within 10 feet of the high-water level, and all snags and down wood in the channel and the RMA. In addition to that, you are required to leave all live conifer trees 6 inches DBH or larger in the RMA up to these maximum numbers:

- 150 conifers per 1,000 feet along large Type F streams
- 100 conifers per 1,000 feet along medium Type F streams
- 70 conifers per 1,000 feet along small Type F streams

The basal area of these conifers is not specified.

Situation B: The live conifer basal area is less than one-half of the standard target.

Depending on the local conditions, one of three different prescriptions can be used:

- Alternative Prescription 1
- Alternative Prescription 2
- 3 Default Standard

Type SSBT may use Alternative Prescription 1 or Alternative Prescription 2 but not 3. Default Standard.

ALTERNATIVE PRESCRIPTION 1

This can be used on Type F and Type SSBT stream RMAs if the RMA can grow conifers and has been damaged by a catastrophic event such as wind, insects, disease or wildfire.

This prescription protects the stream while a new conifer stand grows.

Landowners must leave the following:

- all trees that have fallen in the stream (exception: parts of down trees that lie outside the high-water level may be harvested if it does not make the trees less stable in the stream)
- all live and dead trees within 20 feet of the high-water level of large and medium streams, and within 10 feet of the high-water level on small streams
- *for Type F streams*, enough live trees, dying or recently dead trees, and downed logs within the RMA to meet the active management target (tables 2-4 and 2-10)
- *for Type D and large and medium Type N streams*, enough live trees, dying or recently dead trees, and down logs within the RMA to meet the standard target (tables 2-11 and 2-12)

- all trees that must be left in and near the stream can count towards meeting the basal area requirements, if they are large enough
- live conifers left first, with down or dead trees making up the rest of the basal area target if necessary

For this prescription only, landowners may count double the basal area of each dying or recently dead tree or each windthrown tree in the channel to meet the basal area target.

ALTERNATIVE PRESCRIPTION 2

This can be used on any Type of stream RMA if the RMA can grow conifers but is dominated by hardwoods. To apply Prescription 2:

- Identify sections of the RMA (minimum 200 feet long) where the basal area and number of trees meet one-half the standard target, and apply the general prescription (page 24) on those sections (as shown in the left portion of the illustration below).
- In sections where one-half the standard target is not met, divide the RMA into "conversion" and "retention" blocks. The purpose of the conversion blocks is to promptly convert them to conifers by harvesting the hardwoods and planting conifers. Only some hardwoods are harvested in the retention blocks, so as to more gradually change this area to conifers.

To help achieve these goals:

In the conversion blocks:

- Leave all trees growing in the stream and within 10 feet of the high-water level (plus trees within 20 feet that lean over large streams).
- The total length in conversion blocks can't be any more than half the stream length in the harvest unit. Conversion blocks also can't be more than 500 feet long and must be at least 200 feet apart.



Alternative Prescription 2 for RMAs dominated by hardwoods

In the retention blocks:

- · For large streams, leave all conifers within 50 feet of the high-water level and all hardwoods within 30 feet of the high-water level.
- · For medium streams, leave all conifers within 30 feet of the high-water level and all hardwoods within 20 feet of the highwater level.
- · For small streams, leave all trees within 20 feet of the highwater level.

3. DEFAULT STANDARD

If you don't want to - or can't - use Alternative Prescription #1 or #2, or if the RMA is not capable of growing conifers, use the default standard, except for Type SSBT streams. This requires that, except for cable yarding corridors or stream crossings reviewed by ODF, landowners must leave:

- all understory plants within 10 feet of the high-water level
- all snags and down wood in the channel and RMA (any safety or fire hazards may be cut, but can't be removed)
- all trees leaning over the channel
- all conifers in the RMA and all hardwoods within the highwater level for the distances indicated in Table 2-7

14. What if you decide to thin the harvest unit instead of doing a Type 3 harvest along the Type F stream?

Depending on the kind of thinning done, the harvest could be Type 1 or Unclassified (see page 13, "You want to harvest timber"). Either way, all the steps for the Type 3 harvest still apply, except that now the target basal area numbers in Table 2-10 are used instead of those in Table 2-4.

Example 2 - Type SSBT Stream

GENERAL PRESCRIPTIONS FOR TYPE SSBT STREAMS.

The purpose for the SSBT vegetation retention prescriptions is to ensure that forest operations will not impair the achievement and maintenance of the protecting cold water criterion.



These general prescriptions attempt to achieve fairly uniform distribution of trees in the RMA, by specifying amounts of conifer and hardwood basal area and the number of live conifer trees to be left in an Inner Zone and Outer Zone of the RMA located beyond 20 feet of the stream high-water level and within 500-foot stream segments. The trees located within 20 feet of the stream high-water level are in the No Harvest

Table 2-7 Default standard requirements: Leave all conifers and all hardwoods within these distances of the high-water level.

Stream	Conifers	Hardwoods
Type F Large	100 feet	50 feet
Type F Medium	70 feet	30 feet
Type F Small	50 feet	20 feet

Zone and do not count for basal area or live conifer trees, but they may count toward the wildlife leave trees.

The general prescription requirements for Type SSBT streams also apply to the "main stem" of any Type F stream upstream of the Type SSBT of a harvest of Type 2 or Type 3 units in the following Geographic Regions: Coast Range, South Coast, Interior and Western Cascades. The extent of the "main stem" is the higher of the upstream boundary of the harvest unit containing the Type SSBT stream, or the upstream boundary of an adjacent upstream harvest unit that is commenced within a year of completing the harvest unit containing the Type SSBT stream.

Operators shall retain:

- all understory vegetation within 10 feet of the high-water level
- all trees within 20 feet of the high-water level
- all trees in the RMA that lean over the stream channel

There are several prescription options when harvesting in a Type SSBT RMA, as described below. Additionally, when the live conifer basal area within the riparian managment area is less than half the standard target for a small or medium Type F stream as described in Table 2-4 or medium Type D and N stream described in Table 2-11, the operator may apply the appropriate Alternative Prescription, as shown on page 25.

TYPE SSBT PRESCRIPTION 1 - NO HARVEST RMA:

The operator may apply the Type SSBT Prescription 1 to any Type SSBT stream.

- all trees within 60 feet of the high-water level of a small stream
- all trees within 80 feet of the high-water level of a medium stream



This graphic shows a 200-foot-long section of a Medium Type SSBT stream with tree retention for harvest Type 2 or Type 3. The retention requirements are based on Table 2-8 on page 28. The stand being harvested had 200 trees per acre with an average DBH of 14", so every tree represents about 1 square foot of basal area. The No Harvest Zone (20 feet) will retain all 200 trees per acre, or about 18 trees in the 200 feet shown. The Inner Zone (30 feet) shows 18 trees retained and 10 stumps in the 200 feet shown. This is equivalent to 45 trees and 25 stumps in 500 feet. The Outer Zone (30 feet) shows 10 trees retained and 18 stumps in the 200 feet shown. This is equivalent to 25 trees and 45 stumps in 500 feet.

TYPE SSBT PRESCRIPTION 2 - PARTIAL HARVEST RMA:

Operators shall retain trees that are well-distributed by length and width of the riparian management area beyond 20 feet of the high-water level of the



stream, minimize the creation of large gaps, favor small openings in the canopy, and leave residual trees in a manner that promotes understory as well as diameter and crown growth. Operators shall satisfy these requirements by meeting the following minimum standards:

The operator may apply the Type SSBT Prescription 2 – Partial Harvest RMA, where the basal area of trees 6 inches or greater DBH within the RMA, but more than 20 feet from the high-water level of the Type SSBT stream, exceeds the total basal area target shown in Table 2-8.

For small Type SSBT streams, the RMA length will be measured in 500-foot segments and divided into three zones:

- No Harvest Zone: O to 20 feet of the high-water level
- Inner Zone: 20 to 40 feet of the high-water level
- Outer Zone: 40 to 60 feet of the high-water level

RMA total 37 sq. ft. basal area and RMA total 8 live conifers; see Table 2-8.

The Inner Zone and Outer Zone shall each contain:

- 10 sq. ft. basal area target, rounded up to the nearest whole number, as a measurement of hardwood and conifer trees and snags 6 inches or greater DBH, and
- up to 10 percent of the basal area requirements may be composed of sound conifer snags at least 30 feet tall, and
- four live conifer trees, rounded up to the nearest whole tree, as a measurement of live conifer trees at least 8 inches DBH, and

For medium Type SSBT streams, the RMA length will be measured in 500 foot segments and divided into three zones:

- No Harvest Zone: O to 20 feet of the high-water level
- Inner Zone: 20 to 50 feet of the high-water level
- Outer Zone: 50 to 80 feet of the high-water level

RMA total 69 sq. ft. basal area and RMA total 15 live conifers; see Table 2-8

The Inner Zone and Outer Zone shall contain:

- 18 sq. ft. basal area target, rounded up to the nearest whole number, as a measurement of hardwood and conifer trees and snags 6 inches or greater DBH, and
- up to 10 percent of the basal area requirements may be composed of sound conifer snags at least 30 feet tall, and
- seven live conifer trees, rounded up to the nearest whole tree, as a measurement of live conifer trees at least 8 inches DBH.

TYPE SSBT PRESCRIPTION 3 - NORTH-SIDED BUFFER:

This prescription is intended for the north side of Type SSBT stream segments that run generally east to west for at least 200 feet. The operator may apply the Type SSBT Prescription 3 if:

- the north side of a Type SSBT stream has a Type SSBT stream segment at least 200 feet in length, and
- the Type SSBT stream has a stream valley direction that runs in a general east-west direction, and the stream valley direction is between 60 and 120 degrees east and 240 and 300 degrees west on a compass bearing of 0 and 360 degrees as north

Where the Type SSBT Prescription 3 – North-sided Buffer is not applied, the operator shall apply either Type SSBT Prescription 1 – No Harvest RMA or Type SSBT Prescription 2 – Partial Harvest RMA.

Operators shall:

Retain all trees within 40 feet of the high-water level on the north side of a Type SSBT stream where the stream-valley direction criteria are met. The operator shall describe in a written plan and map where Prescription 3 is intended to be implemented.

Relief for General Prescriptions for Type SSBT Streams

Upon written request from a landowner, relief is available if the additional encumbered forested stream area due to Type SSBT classification is 8 percent or more of the forested portion of any parcel. The additional encumbered forested stream area is measured by the increase in acres of the Type SSBT vegetation prescription over the vegetation prescription for Type F streams. To determine the additional percentage of forested stream area encumbered, the

If a landowner qualifies for Type SSBT relief, there are two prescription options:

increase in acres is divided by the forested parcel acres.

TYPE SSBT RELIEF PRESCRIPTION 1 - NO HARVEST RMA:

The width of the Type SSBT RMA is reduced to 50 feet for small or 70 feet for medium Type SSBT streams:

- Retain all trees within 50 feet of the high-water level of a small Type SSBT stream.
- Retain all trees within 70 feet of the high-water level of a medium Type SSBT stream.

Table 2-8. Type SSBT Prescription 2 – Partial Harvest RMA: Streamside Tree Retention for Harvest Type 2 or Type 3 Units (OAR 629-642-0105)							
	Geographic Regions: Coast Range, South Coast, Interior, Western Cascades						
Basal area target: Square feet of basal area per each 500-foot-long stream segment, each side of the stream (any combination of conifers and hardwoods 6 inches or greater DBH)							
	Medium Type SSBT RMA = 80 feet	Small Type SSBT RMA = 60 feet	Medium Type SSBT RMA = 80 feet	Small Type SSBT RMA = 60 feet			
No Harvest Zone	O to 2O feet = Retain all tre requirements in this table.	ees. Trees in this area do not	count toward meeting the ba	asal area or live conifer tree			
Inner Zone	20 to 50 feet: minimum 18 sq. ft.	20 to 40 feet: minimum 10 sq. ft.	20 to 50 feet: minimum 7 trees	20 to 40 feet: minimum 4 trees			
Outer Zone	50 to 80 feet: minimum 18 sq. ft.	40 to 60 feet: minimum 10 sq. ft.	50 to 80 feet: minimum 7 trees	40 to 60 feet: minimum 4 trees			
	RMA Total (20 to 80 feet) = 69 sq. ft.	RMA Total (20 to 60 feet) = 37 sq. ft.	RMA Total (20 to 80 feet) = 15 trees	RMA Total (20 to 60 feet) = 8 trees			

1. Distances are measured from the high-water level of the Type SSBT stream.

2. Up to 10% of the basal area requirement may be composed of sound conifer snags 6 inches or greater DBH and at least 30 feet tall.

3. Must meet requirements of each zone and RMA total.

TYPE SSBT RELIEF PRESCRIPTION 2 - PARTIAL HARVEST RMA

Operators shall retain trees that are welldistributed by length and width of the RMA beyond 20 feet of the high-water level of the Type SSBT stream, minimize the creation of large gaps, favor small openings in the canopy, and leave residual trees in a manner that promotes understory as well as diameter and crown growth.

The width of the Type SSBT RMA is reduced to 50 feet for small and 70 feet for medium Type SSBT streams, and Table 2-9 describes the reduced basal area targets and live conifer tree requirements. Operators shall meet the following minimum standards.

For small Type SSBT streams, the RMA length will be measured in 500-foot segments and divided into three zones:

- No Harvest Zone: O to 20 feet of the high-water level
- Inner Zone: 20 to 35 feet of the high-water level
- Outer Zone: 35 to 50 feet of the high-water level

RMA total 28 sq. ft. basal area and RMA total 6 live conifers; see Table 2-9.

The Inner Zone and Outer Zone shall contain:

- 7 sq. ft. basal area target, rounded up to the nearest whole number, as a measurement of hardwood and conifer trees and snags 6 inches or greater DBH, and
 - up to 10 percent of the basal area requirements may be composed of sound conifer snags at least 30 feet tall, and
- three live conifer trees, rounded up to the nearest whole tree, as a measurement of live conifer trees at least 8 inches DBH, and

For medium Type SSBT streams, the RMA length will be measured in 500-foot segments and divided into three zones:

- No Harvest Zone: O to 20 feet of the high-water level
- Inner Zone: 20 to 45 feet of the high-water level
- Outer Zone: 45 to 70 feet of the high-water level

RMA total 58 sq. ft. basal area and RMA total 13 live conifers; see Table 2-9.

The Inner Zone and Outer Zone shall contain:

- 15 sq. ft. basal area target, rounded up to the nearest whole number, as a measurement of hardwood and conifer trees and snags 6 inches or greater DBH, and
 - up to 10 percent of the basal area requirements may be composed of sound conifer snags at least 30 feet tall, and
- six live conifer trees, rounded up to the nearest whole tree, as a measurement of live conifer trees at least 8 inches DBHiew activity

Table 2-9. Type SSBT Relief Prescription 2 – Partial Harvest RMA: Streamside Tree Retention for Harvest Type 2 or Type 3 Units (OAR 629-642-0110)					
	Geographic Region	s: Coast Range, South Coa	st, Interior, Western Casca	ıdes	
BASAL AREA TARGET: Square feet of basal area per each 500-foot-long stream segment, each side of the stream (any combination of conifers and hardwoods 6 inches or greater DBH)					
	Medium Type SSBT RMA = 70 feet	Small Type SSBT RMA = 50 feet	Medium Type SSBT RMA = 70 feet	Small Type SSBT RMA = 50 feet	
No Harvest Zone	O to 2O feet = Retain all tre requirements in this table.	ees. Trees in this area do not	count toward meeting the ba	asal area or live conifer tree	
Inner Zone	20 to 45 feet: minimum 15 sq. ft.	20 to 35 feet: minimum 7 sq. ft.	20 to 45 feet: minimum 6 trees	20 to 35 feet: minimum 3 trees	
Outer Zone	45 to 70 feet: minimum 15 sq. ft.	35 to 50 feet: minimum 7 sq. ft.	45 to 70 feet: minimum 6 trees	35 to 50 feet: minimum 3 trees	
	RMA Total (20 to 70 feet) = 58 sq. ft.	RMA Total (20 to 50 feet) = 28 sq. ft.	RMA Total (20 to 70 feet) = 13 trees	RMA Total (20 to 50 feet) = 6 trees	
Natas					

Notes:

1. Distances are measured from the high water level of the Type SSBT stream.

2. Up to 10% of the basal area requirement may be comprised of sound conifer snags 6 inches or greater DBH and at least 30 feet tall.

3. Must meet requirements of each zone and RMA total.

		Causana Fasta	f Danal Awan w	an 1 000 fact of	Churchen Frich Ci			
Geographic Region		Square Feet of Basal Area per 1,000 feet of Stream, Each Side						
	Large Type F RMA = 100 feet		Medium Type F RMA = 70 feet		Small Type F RMA = 50 feet			
	Standard Target	Active Management Target	Standard Target	Active Management Target	Standard Target	Active Management Target		
Coast Range and S. Coast	300	270	160	140	50	30		
Interior & W. Cascade	350	310	180	160	50	30		
Siskiyou	290	260	140	120	50	30		
E. Cascade & Blue Mountain	220	200	120	100	50*	50**		

Table 2-10 Streamside Tree Retention for Type F Streams with Type 1 or Unclassified Harvest

*The maximum live conifer basal area that must be left is 40 square feet. The other 10 square feet may come from snags, dying trees or hardwood trees if available in the RMA.

**Live conifer basal area may be reduced to 30 square feet for the Active Management target. The other 20 square feet must come from snags, dying trees or hardwood trees if available in the RMA.



This is a medium Type D stream.

Example 3 - Type N or D Stream

The process you will follow is the same, but there are a few changes in the requirements. Let's first review the overall process, in which you need to:

- identify the geographic region and the size and type of stream in your harvest
- identify the type of harvest you plan Type 1, Type 2, Type 3 or Unclassified
- · measure the length of stream within the harvest unit
- measure and mark the RMA width and the live conifer basal area in the $\ensuremath{\mathsf{RMA}}$

Then, answer the following questions:

Question 1

Is your live conifer basal area more than the standard target shown in Table 2-11 or Table 2-12, depending on your type of harvest?

If the answer to Question 1 is yes, you must leave enough trees to meet the standard target shown in Tables 2-11 or 2-12. You must also follow the other general prescription requirements in Item 8 on page 23, including the numbers of trees to be left along Type D and N streams.

As with Type F streams, the basal area of certain hardwood trees, dead or dying trees or snags can make up a portion of the basal area standard target. The allowances for Type D and N streams are similar to Type F streams, but there are differences. See Table 2-13, which applies to west-side geographic regions, or Table 2-14 for east-side geographic regions. Note also that, without fish, Type D and N streams have no active management target option tied to habitat enhancement work.

Question 2

What if your live conifer basal area is less than the standard target?

As with the Type F example, there are two possible situations:

Situation A: The live conifer basal area is less than the standard target, but greater than one-half of the standard target.

You must leave:

- trees within 20 feet of the high-water level, trees that lean over the stream, understory plants within 10 feet of the high-water level, and all snags and down logs in the channel and RMA, and
- all live conifer trees 6 inches DBH or larger (no basal area is specified) in the RMAs of all large or medium Type N streams up to these maximum numbers:

100 conifers per 1,000 feet along large Type D or N streams

70 conifers per 1,000 feet along medium Type D or N streams

Table 2-11 Streamside Tree Retention for Type D and Largeand Medium Type N Streams with Type 2 or 3 Harvest

	Square Feet of Basal Area per 1,000 feet of Stream, Each Side				
Geographic Region	Large Type D & N Medium Type D RMA = 70 feet RMA = 50 fe		Small Type D RMA = 20 feet		
	Standard Target	Standard Target	Standard Target		
Coast Range & S. Coast	90	50*	0		
Interior & W. Cascade	110	50*	0		
Siskiyou	90	50*	0		
E. Cascade & Blue Mtn.	70	50*	0		

*Hardwoods may count up to 30 square feet per 1,000 feet toward meeting the standard target

Table 2-12 Streamside Tree Retention for Type D and Large anMedium Type N Streams with Type 1 or Unclassified Harvest

	Square Feet of Basal Area per 1,000 feet of Stream, Each Side				
Geographic Region	Large Type D & N RMA = 70 feet	Type D & N Medium Type D & N A = 70 feet RMA = 50 feet			
	Standard Target	Standard Target	Standard Target		
Coast Range & S. Coast	140	60*	0		
Interior & W. Cascade	160	60*	0		
Siskiyou	120	60*	0		
E. Cascade & Blue Mtn.	100	60*	0		

*Hardwoods may count up to 30 square feet per 1000 feet towards meeting the standard target

Table 2-13 Hardwoods, dead and dying trees, or snags in Type D and N stream RMAs that count toward basal area targets for west-side Geographic Regions				
Type D and Type N Streams Coast Range, S. Coast, Interior, Western Cascades and Siskiyou Geographic Regions	Large	Medium		
Cottonwood and Oregon ash (6 inches or greater DBH) left in the RMA and growing more than 20 feet from the high-water level may count toward basal area target.	Х			
A combination of the following can make up to 10 percent of the basal area target:1. The basal area of hardwoods (except red alder) retained in the RMA that are greater than 24 inches DBH and grow more than 20 feet from the high water level.2. The basal area of sound conifer snags (6 inches or greater DBH and at least 30 feet high) that are anywhere in the RMA.	Х			
 Hardwood trees retained in the RMA can contribute up to a maximum of 30 square feet of basal area per 1000 feet toward meeting the basal area target. Sound conifer snags (6 inches or greater DBH and at least 30 feet high) can contribute up to 5 percent of the basal area target. 		Х		

Situation B: The live conifer basal area is less than onehalf of the standard target.

You can use one of three different prescriptions depending on the circumstances:

ALTERNATIVE PRESCRIPTION 1

Refer to Alternative Prescription 1 under Question 13 on page 24. It is the same for Type D streams and large and medium Type N streams.

ALTERNATIVE PRESCRIPTION 2

Refer to Alternative Prescription 2 under Question 13 on page 24. It is the same for Type D streams and large and medium Type N streams.

DEFAULT STANDARD

If you don't want to – or can't – use Alternative Prescription 1 or 2, or if the RMA is not capable of growing conifers, use the default standard. Except for cable yarding corridors or stream crossings reviewed by ODF, landowners must leave:

- all trees within 20 feet of the high-water level and all trees in the RMA that lean over the stream
- all understory plants within 10 feet of the high-water level
- all snags and down wood in the channel and RMA any safety or fire hazards may be cut, but can't be removed, and
- all conifers and hardwoods within the high-water level for the distances indicated in Table 2-15

Finally, to be clear about small Type D and N streams (see illustration):

There are no basal area targets for small Type D or small Type N streams. The requirements for small Type D streams are to leave all trees, snags and down logs within 20 feet of the stream and all understory vegetation within 10 feet of the stream. The requirements for small Type N streams are shown in Table 2-16.

Although relatively uncommon, Type N streams subject to rapidly moving landslides have some unique riparian tree retention requirements. Such streams are found primarily in very steep, upland terrain – if you suspect such a situation check with ODF to verify the applicable requirements. See Pages 51-53 for further information about landslide-prone terrain.

General prescription summaries

The Appendix, pages 160-191 includes one-page summaries of the general prescription requirements for streams. Use them when the live conifer basal area in the RMA is more than the standard target.

Table 2-14 Hardwoods, dead and dying trees, or snags in Type D and N stream RMAs that count toward basal area targets for Eastside Geographic Regions

Type D and N streams E. Cascades and Blue Mountains Geographic Regions	Large	Medium
All live hardwoods left in RMA may count toward the basal area target.	Х	Х
Sound conifer snags (6 inches or greater DBH and 30 feet high) left in the RMA may count toward as much as 10 percent of the basal area target.	Х	
Sound conifer snags (6 inches or greaterin DBH and 30 feet high) can contribute up to 5 percent of the basal area target.		Х

Table 2-15 Default Standard requirements:leave all conifers and all hardwoods withinthese distances of the high water level

	Conifers	Hardwoods
Large Type D	70 feet	30 feet
Medium Type D	50 feet	20 feet
Small Type D	20 feet	20 feet
Large Type N	70 feet	30 feet
Medium Type N	50 feet	20 feet

Quick Review

Use one of these:	When RMA basal area is:
General Prescription	More than the standard target
Situation A	Less than but more than half of the standard target
Situation B	Less than half of the standard target
Alternative Prescription 1	Less than half of the standard target and catastrophic damage
Alternative Prescription 2	Less than half of the standard target and dominated by hardwoods
Default Standard	Less than half of the standard target and Alternative Prescription 1 or 2 are not acceptable

Example 3 - Alternate Practice

Can you propose your own idea for stream protection?

Yes. You can always propose a different way of doing things. Such a "plan for an alternate practice" is specifically allowed because written requirements cannot fit every situation and alternatives can sometimes work better. Keep in mind that your plan will need to show ODF how it will protect fish and wildlife and other resources as well or better than the standard requirements. You can't proceed with your alternate plan unless ODF approves it.

Another issue in some streamside forests in drier regions of Oregon is extensive insect damage when trees are stressed by growing too close together. Also, hardwoods such as aspen and cottonwood can be very important for streams in these regions. In such cases, landowners are encouraged to talk with ODF about site-specific plans that can help both forests and streams.

Is there more to know about written plans when harvesting within 100 feet of a Type F, SSBT or D stream?

Yes - there is a lot to know.

The requirements when harvesting along Type F, SSBT or D streams can be somewhat complicated. But this section shows how different options and flexibility are available. If you decide to do a harvest, you must prepare a written plan for review by ODF – an example is shown on pages 143-144.

THERE IS ONE MORE OPTION.

Many landowners choose not to operate in Type F, SSBT and D stream RMAs when harvesting timber. That way they avoid RMA planning and written plan preparation.

Is avoiding RMAs the way to go?

There is no financial compensation from the government for avoiding RMAs or leaving more trees near streams than is required. Some landowners still choose to do so for various reasons.

While the requirements may seem complicated, they do allow for active management within the RMA. Landowners are encouraged to check out all the options and make an informed choice.

For other information sources, see the Appendix, pages 197-198.



Example of a small Type N stream. Such streams often lack fish due to a waterfall or other natural feature that limits access or favorable habitat.

Table 2-16 Retention forSpecified Small Type N Streams

Geographic Region	Retain Understory Vegetation and Unmerchantable Conifers* 10 Feet on Each Side of the Stream for:
E. Cascades & Blue Mountains	All perennial streams
South Coast	Portions of perennial streams where the upstream drainage area is greater than 160 acres.
Interior	Portions of perennial streams where the upstream drainage area is greater than 330 acres.
Siskiyou	Portions of perennial streams where the upstream drainage area is greater than 580 acres.
Coast Range & W. Cascades	No retention required
Protect all small	Type N streams in all regions from sediment

and disturbance as noted on pages 57, 58 and 109. For small Type N streams subject to rapidly moving landslides, retain trees as described on pages 51-53.

*Unmerchantable conifers means conifers less than 6 inches DBH.

You want to harvest timber near a lake. How do you meet the requirements?

What is a lake?

Lakes have year-round standing open water. A lake includes the water, vegetation, aquatic life, beds, banks or wetlands below the normal high-water level.

What is not considered a lake?

Water developments that are not part of a natural stream – these include constructed features such as waste treatment lagoons, farm ponds and log ponds.

There are two major classes of lakes:

- large lakes (greater than 8 acres)
- other lakes (two kinds):
 - between one-half acre and 8 acres, or less than 8 acres with fish
 - less than one-half acre with no fish

What are lake protection requirements intended to do?

Protect the following functions and values of lakes:

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

How are large lakes protected during forest operations?

- A written plan, reviewed by ODF, is required for operations within 100 feet of a large lake.
- The RMA width is 100 feet, as measured from the high-water level.
- RMA retention requirements are specified in Table 2-17.
- Operations must never cause sedimentation or drain lakes.
- 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 on pages 55-56 and 74.

How are other lakes protected during forest operations?

See Table 2-17 for specific requirements for other lakes with or without fish.



Table 2-17 Lake Protection Requirements		
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 1/2 of the trees by species and size.*
Other lakes (between 8 acres and 1/2 acre, or less than 8 acres with fish)	50	Same as for large.
Other lakes (less than 1/2 acre, no fish)	No RMA	If greater than 1/4 acre, leave snags and down wood.**
*Leave 50 percent 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, • larger than 30 inches		
** These can be counted toward re	equirements for snags and dow	n logs in clearcuts

Leave all trees along the edge of the lake. Otherwise, leave trees should be well distributed.

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 harvest areas.

Protect the lake from disturbance that would damage water quality.

For other information sources, see the Appendix, pages 197-198.

You want to harvest timber in or near a wetland. How do you meet the requirements?

What is a wetland?

Wetlands, especially smaller ones, are not as obvious as streams and lakes. Wet soils, surface or ground water 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.

Don't be fooled. Wetlands may dry out in the summer and have different sizes and shapes. If you're unsure about an area, check with ODF or seek specialized assistance.

Where will you 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

What is not considered a wetland?

Water developments that are not part of natural streams or lakes (such as waste treatment lagoons, farm ponds and log ponds) are not considered wetlands.

THERE ARE THREE CLASSES OF WETLANDS:

- **Significant wetlands** are greater than 8 acres, or estuaries, bogs or certain eastern Oregon springs (regardless of size).
- Stream-associated wetlands are smaller than 8 acres and located next to streams.
- Other wetlands are smaller than 8 acres.



How are significant wetlands protected during harvest?

- the RMA width is measured from the edge of the wetland (see Table 2-18)
- vegetation must be left in the RMA (see Table 2-18)
- operations must never drain or cause sediment to enter the wetland
- a written plan, reviewed by ODF, is required for operations within 300 feet of the wetland

Why protect wetlands?

- They contribute surface and groundwater.
- They can maintain or improve water quality.
- They can reduce flood impacts.
- They can provide habitats for aquatic plants, fish and wildlife.
- They can offer recreational opportunities such as wildlife viewing.

How are stream-associated wetlands protected during harvest?

- Give these areas the same protections as required for the stream type they're associated with.
- Further specifics are shown in Table 2-18.
- Converting or draining is not allowed, even for the purpose of establishing trees.
- Never drain or cause sediment to enter a stream-associated wetland.

How are other wetlands protected?

- Snags and down trees in the wetland must be left. See Table 2-18 for specifics.
- Converting or draining is not allowed, even for the purpose of establishing trees.
- When possible, avoid operations in wetlands. Ground equipment must not cause rutting or soil compaction, or affect water quality. Successful operations may occur during dry or



Stream-associated wetland and its 25-foot RMA.

Table 2-18 Wetland Protection Requirements			
Class of Wetland	Riparian Management (feet)	Area Protection Required (Both wetland & its RMA)	
Significant (Greater than 8 acres, or estuaries, bogs or certain E. OR springs)	Estuaries 100 – 200 Bogs 50 – 100 E. OR Springs 50 – 100 Wetlands 100	Leave: understory plants, all snags and down wood, and 1/2 of the trees by species and size*	
Stream-associated (Next to a stream)	Stream RMA goes around it ***	Included in stream RMA	
Other (Less than 8 acres)	No RMA	If greater than 1/4 acre leave, snags and down wood.** If less than 1/4 acre, no leave requirements.	

*Leave 50 percent 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
- Larger than 30 inches

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.

** These may be counted toward requirements for snags and down logs in clearcuts.

*** Where wetlands or side channels extend beyond the RMA, expand the RMA to include the wetland or side channel plus 25 additional feet. This does not apply to small Type N streams.



frozen conditions. Cable harvesting is an alternative, where appropriate.

• Depleting, adding water or draining other wetlands must be avoided.

For other information sources, see the Appendix, pages 197-198.

What are the requirements for leaving wildlife trees, snags and down logs?

What's the difference?

- Wildlife tree: either a snag or green tree of a minimum size that is required to be left (details below).
- Snag: dead standing tree that has lost its needles and small limbs.
- Down log: existing down log or a down green tree of minimum size (details below).

What's so important about snags and down logs?

Snags provide homes to owls, woodpeckers, bats, squirrels, bluebirds, wood ducks, swallows, mergansers, weasels, raccoons and many other animals. More than 50 species of birds and mammals use snags for nesting, feeding and shelter. A lack of snag cavities for nesting can limit populations of some bird species. Snags larger than 20 inches DBH are in short supply on private lands. Snags can be created



Larger-diameter, taller snags stand longer and provide more cavities.



from live trees, and wildlife respond quickly to their availability.

You can avoid the cost of creating snags by selecting existing snags, or rotting or deformed trees for retention. In eastern Oregon, down logs are used by 150 species of wildlife, including amphibians, reptiles, birds and mammals. Logs are also important to certain insects, fungi and plants. Be aware that too many down logs can be a fire hazard; however, a forest without down logs may have fewer species of plants and animals. It's not necessary to leave sound logs. Deformed or rotten parts of tree stems left in the forest after a harvest can meet down log requirements, if they would be solid enough to pick up with a log loader (see Table 2-19).



Protected areas under the log are used as nesting cover by grouse and as hiding cover by rabbits and hares.



When the bark loosens, there is hiding cover for tree frogs and amphibians. The trunk is a food source for woodpeckers, particularly pileated woodpeckers.



Small mammals burrow into the interior as the log softens. Bears, raccoons and skunks feed on insects.

How do I know when wildlife trees and down logs are required?

If you are planning a harvest of 25 acres or more and the harvest will leave fewer than the number of trees per acre or basal area per acre indicated in Table 2-1 on page 16, wildlife trees and down logs will be required. Just like the requirements for reforestation, the trees per acre and basal area requirements vary according to site class.

Wildlife trees and down logs must be left in all Type 2 or 3 harvests that are larger than 25 acres (Table 2-2 on page 17), and in some cases when adjacent new and older Type 2 or 3 harvests together exceed 25 acres (see Example 2 on page 18).

Regardless of the size of the harvest unit, snags and down logs must be left in all wetlands, and in all RMAs for wetlands, lakes, Type F, and large and medium Type D and N streams (see details below).

How many wildlife trees need to be left?

On average, per acre you must leave at least:

- two snags or two green trees at least 30 feet tall and 11 inches DBH or larger, at least 50 percent of which are conifers, plus
- two down logs or down trees, at least 50 percent of which are conifers. Each must be at least 6 feet long with a total volume of at least 10 cubic feet. Logs containing 20 cubic feet or more count as two logs (see Table 2-17 for sizes that qualify)



Minimum Lengths and Diameters These sizes = 1 down log These sizes = 2 down logs (10 cubic feet) (20 cubic feet) Diameter Diameter Length Length (inches, (inches, (feet) (feet) small end) small end) 6 18 6 25 8 15 8 21 10 14 10 19 12 12 12 17 14 14 11 16 20 9 20 13 28 8 28 11 36 9 44 8

Table 2-19 Down Log

Leave these wildlife trees:

two snags or two green trees

- at least 30 feet tall
- 11 inches DBH or larger and
- 50 percent must be conifers

And two down logs or down trees

- at least 6 feet long
- at least 10 cubic feet total volume and
- 50 percent must be conifers

Harvest areas next to Type F streams.

Where should wildlife trees be left?

Wildlife trees, snags and down logs may be left in one or more clusters across the harvest unit, or they can be scattered throughout the unit (see illustration).

What are the requirements near certain streams?

To provide increased benefits to fish, ODF may require up to 25 percent of the needed wildlife trees be left near the stream if the harvest unit is next to a Type F stream. The trees would be in addition to other trees required to be left in RMAs. Also, to provide extra sources of large wood to streams, wildlife trees must be left along the lower sections of steep, small Type N streams that empty directly into Type F streams. After receiving your notification, ODF will tell you if one of these streams is on your harvest unit.

Can RMA snags and down logs substitute for harvest unit wildlife trees?

Wildlife tree, snag and down log requirements are in addition to other requirements for tree retention, such as for wetland and wildlife site buffers. However, in some limited situations the wildlife and down log requirements can be met by counting snags, trees or logs otherwise required to be left in RMAs or other resource sites. For more information, see the stream protection summaries in the Appendix, pages 160-191, or check with ODF.

What if your harvest is less than 25 acres?

Leaving wildlife trees, snags or down logs is not required if your actual harvest, combined with any adjacent prior harvest on the same ownership, is less than 25 acres. However, leaving wildlife trees, snags and logs voluntarily is always encouraged, to benefit forest productivity and wildlife habitat.

Can snags create a wildfire hazard?

Yes. They are vulnerable to lightning strikes, and during a wildfire hollow snags also can create a chimney effect where burning embers are sent into the air, starting new fires some distance away. Always consider the wildfire hazard of snags.

Can snags create a safety hazard?

Yes. Snags can collapse or drop limbs without warning. Oregon law (OAR Chapter 437, Division 7 Forest Activities safety rules, administered by the Oregon Occupational Safety and Health Division) requires operators to always identify snags and other danger trees. Danger trees have evidence of rot, excessive lean, spike tops, etc.

Never operate machines near snags – they can be accidentally bumped or the

ground vibration can cause unexpected collapse. Always mark the safety hazard area around snags. Isolate snags and notify all workers by marking the area with plastic ribbon.

Before beginning tree felling in harvests larger than 25 acres, identify wildlife trees that will be left. This will ensure a sufficient number of wildlife trees are left in the harvest area.

Workers should know about snag hazard areas, especially when moving cables, during log skidding or when tree felling is occurring nearby.

Minimize worker exposure to wildlife tree hazards by leaving them among a clump of trees, along harvest boundaries, near stream RMAs, between cable corridors, * on rock outcrops or at the back end of the harvest area.

What do you look for when selecting wildlife trees?

The first choice should be to leave safe snags in safe locations, but it is often necessary to leave green wildlife trees that will eventually become snags. What should you look for?

- a broken or dead top
- · dead branches in the crown
- old wounds or scars at the base of the tree
- indication of internal rot (fungi, conks or existing woodpecker cavities along the stem)
- the largest-diameter and tallest trees

How do I ensure protection of existing down logs?

Down logs can be crushed and broken by logging equipment. Never allow yarding and skidding without informing workers about down log needs. It may be possible to save existing down logs by identifying their location.

Is there opportunity for alternative plans?

Yes. The location and species of wildlife trees and down logs may be modified following review by ODF. For example, you may be able to substitute hardwood species for conifer species when managing for hardwoods, or additional leave trees in one unit for those required in another.

For other information sources, see the Appendix, pages 197-198.





indicate

internal

decay



How do you protect sensitive wildlife sites when you harvest?

What are sensitive wildlife sites?

- habitat sites of fish and wildlife species identified as threatened and endangered (T&E) or on other lists adopted, by rule, by the Oregon State Fish and Wildlife Commission or federally listed under the Endangered Species Act (ESA)
- sensitive bird nesting, roosting or watering sites specifically identified for protection in the Forest Practices Act
- · biological sites that are ecologically and scientifically significant
- · significant wetlands
- critical wildlife or aquatic habitat sites that are listed in the "Cooperative Agreement between the Board of Forestry and the Fish and Wildlife Commission (1984)"

What wildlife species are associated with these sensitive sites?

- northern spotted owl (page 43)
- bald eagle (pages 44-45)
- osprey (pages 46-47)
- great-blue heron (page 48)
- golden eagle
- marbled murrelet
- band-tailed pigeon



Band-tailed pigeons are a game species and also an Oregon Conservation Strategy species. Some mineral springs used by band-tailed pigeons are protected by the Forest Practices Act.

Where are sensitive sites located, and what is your responsibility to find sensitive sites?

Your local ODF office has responsibility for maintaining inventories of sensitive resource sites. When you submit your Notification of Operation form, it is ODF's responsibility to identify any sensitive resource sites that may conflict with your operation. Landowners do not have a responsibility under the Forest Practices Act to search for and inventory unknown sites. However, if a landowner or operator knows of or discovers a non-inventoried site during planning or while conducting an operation, the operation must be stopped and ODF informed.

When and how are sensitive resource sites protected?

When operations conflict with sensitive resource sites, protection is required. For some sites, such as significant wetlands and sites used by northern spotted owls, bald eagles, great-blue herons and ospreys, the conflicts have been identified and levels of protections are established (pages 43-48). For other sites, such as those used by golden eagles, band-tailed pigeons, marbled murrelets or other threatened or endangered species, ODF determines if a conflict exists and develops site-specific protections with the landowner and a representative of ODFW. The following questions must be answered.

(Additional fish or wildlife species may be protected in the future if federal or state Endangered Species Act status is granted.)

1. Is the site active?

Active means the site has been used in the recent past by one of the species listed on page 41. For example, a bald eagle may be using another nest site, but the nest site on your property may still require protection. Another example is an old osprey nest that might have been used by the bird six years ago. This site would be considered "abandoned." No protection is required for abandoned resource sites. Multiyear surveys are usually needed to show that a site is inactive, and these surveys are subject to ODF review.

2. What, if any, are the possible conflicts?

A conflict exists if an operation may lead to sensitive resource site destruction, abandonment or reduced productivity. The proposed operation is reviewed and the site inspected with the landowner, operator and representative of ODFW to identify conflicts. If there are no conflicts, no special protection measures are required.

3. How are conflicts resolved?

A written plan must describe reasonable measures sufficient to resolve the conflict in favor of the resource site. Reasonable measures may include, but are not limited to, preparing and implementing a habitat management plan, limiting the timing of forest practices, redesigning the proposed practices in favor of site protection, and excluding the forest activities outright.

What else must a landowner or operator consider when working near sites used by species listed under the ESA?

- Compliance with the Oregon Forest Practices Act requirements does not ensure compliance with the federal ESA. It is the responsibility of the landowner and operator to know and incorporate federal ESA requirements in their actions.
- Landowners with approved "incidental take permits" under the federal ESA may be allowed some exceptions to compliance with the forest practice requirements.
- Additional information about the federal ESA can be obtained from the Oregon offices of the National Marine Fisheries Service (for listed anadromous fish) or the U.S. Fish and Wildlife Service (wildlife and non-anadromous fish).

NOAA

National Marine Fisheries Service Oregon State Habitat Office 1201 NE Lloyd Blvd., Suite 1100 Portland, OR 97232 503-231-2202

U.S. Fish and Wildlife Service Oregon State Office 2600 SE 98th Ave., Suite 100 Portland, OR 97266 503-231-6179 A 70-acre core area of suitable northern spotted owl habitat is required for protection of the nest site. In most cases, timber harvesting is not allowed within this area. Nearby operations that may disturb nesting owls are restricted from March 1 to Sept. 30.





A northern spotted owl nest site can be an actual tree or an activity center of a pair of adult owls.

What about the northern spotted owl?

The northern spotted owl is a threatened species. A threatened species is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Northern spotted owls nest in unique forest habitats that require protection when in use.

What is a northern spotted owl resource site?

It is a 70-acre "core area" encompassing a northern spotted owl nesting site, which can be an actual tree or an activity center of a pair of adult spotted owls. These nesting sites require protection until there is reliable evidence that the site is no longer occupied by a pair of owls. The shape of the core area can vary depending on characteristics of the forest. The boundary is designed to make a contiguous habitat.

How are northern spotted owl resource sites protected?

When a landowner submits a Notification of Operation within one-half mile of a northern spotted owl resource site, ODF will inform the landowner that the owl resource site exists. ODF maintains an inventory of owl sites. If the proposed operation conflicts with the spotted owl resource site, the landowner must submit a written plan for review prior to beginning the operation.

A 70-acre core area of suitable spotted owl habitat is determined by the landowner (sometimes multiple landowners) and ODF. Fledgling owls need this area before they leave the nest site. Mortality of juvenile owls is very high, with predation from other owls and starvation. Suitable habitat is important for their survival before they disperse from the nest.

Suitable spotted owl habitat for the 70-acre core area means:

- a stand of trees with moderate to high canopy closure (60-80 percent)
- a multi-layered, multi-species canopy dominated by large overstory trees (greater than 30 inches DBH)

- a high incidence of large trees with deformities (large cavities, broken tops and other evidence of decadence)
- numerous large snags; large accumulations of fallen trees and other woody debris on the ground
- sufficient open space below the canopy for owls to fly

The core area must consist of forest stands that come closest to approximating the conditions desired by spotted owls.

Forest practices that do not maintain the cores area's habitat suitability for owls are not allowed. In most cases, timber harvesting within the core area will not be allowed.

The period between March 1 and Sept. 30 is when nesting owls can least tolerate disturbance. Forest operations within one-quarter mile of a nest site are not allowed during this time. Seasonal restrictions may be waived if survey data shows that the spotted owls are not actively nesting or not present.

Are there exceptions?

Yes. Exceptions to the protection requirements may be granted by ODF if the operator has obtained an incidental take permit from federal authorities under the federal ESA.



The protected area around a bald eagle nest tree is no less than 330 feet. Size and shape depend on use of the area by bald eagles. The resource site includes the active nest tree and all identified key components – perching/fledging trees, replacement nest trees and a forested area around the nest tree. Do not disturb within 660 feet, or 1,000 feet for use of aircraft. For nesting sites, operations are restricted from Jan. 1 to Aug. 31.

What about the bald eagle?

The bald eagle is a legally protected species, and forests with suitable nest trees are needed for its maintenance. Bald eagle nesting sites are sensitive to forest practices and require protection.

What is a bald eagle nesting resource site?

- Bald eagles often construct more than one nest and vary their use between them from year to year. All bald eagle nests within a given territory require protection, although a nest may not be currently occupied or may not have been used for raising young for many years.
- An active nest tree is one in which a bald eagle has nested in the past five years, whether or not the tree still contains a nest. As long as the

nest tree remains standing, it and the surrounding designated area require protection. Or if the nest tree has fallen but the surrounding area has suitable replacement trees present, the area requires protection for up to a five year period. This is to allow time to determine if the eagles will return and rebuild a new nest.

- Replacement nest trees ensure the maintenance of a site in the future. Bald eagles show a strong attachment to a chosen territory. If a nest tree is lost, the pair will use a nearby replacement nest tree.
- Perch trees are often adjacent to the nest tree. In addition to perching, they are used as nest access points by adults, or pilot trees that young use when learning to fly. They are often snags or live trees with exposed, strong, lateral branches high in the crown.
- Around the nest tree, perching, fledging and replacement trees compose a forested area that provides additional protection and acts as a visual screen.

Facts about bald eagle nests:

- Nests are 5 to 8 feet in diameter and 2 to 3 feet deep.
- Nests are typically located partway down the tree, as eagles prefer to have live branches to shelter the nest.
- They are found in large trees, in prominent locations, giving a clear view of the water. Nest trees are usually located within 1/4 mile of large water bodies, but rarely right on the water's edge.
- In contrast, osprey nests are smaller, located at the very top of a broken-topped tree or snag, and typically very close to the water's edge.

How are bald eagle nesting sites protected?

When a landowner proposes an operation within one-half mile of a bald eagle nesting site, a review is started. If ODF determines that the operation may pose a conflict for the site, a written plan describing how the site will be protected is required.

Any forest operations around the site must be designed to protect the trees from damage and windthrow. Experts must agree on the vegetation to be left. Trees are left to perform a job, either to provide a visual screen for the site or to protect the site from windthrow. This area should not be less than 330 feet from the nest. Its size and shape depend on actual use of the area by bald eagles. General guidelines for nesting areas call for maintaining the existing integrity of the stand. From Jan. 1 to Aug. 31, when nest construction, mating and rearing of young occurs, forest operations are not permitted within 660, feet or 1,000 feet for use of aircraft. ODF may modify this period of time and the distances when an operation will not cause the birds to flush from these trees.

Are there exceptions?

Yes. Exceptions to the protection requirements may be granted by ODF if the operator has obtained an incidental take permit from federal authorities under the federal Bald and Golden Eagle Protection Act: www.fws.gov/ pacific/eagles.







Osprey nest trees on forestland are usually large snags and broken-top trees, up to 60 inches DBH and 100-150 feet tall. Often they are above the surrounding forest and large enough to support a nest 4 to 6 feet in diameter and 1 to 2 feet deep. In other locations, osprey are often seen nesting on man-made telephone pole platforms.

What about the osprey?

Osprey resource sites require protection because they provide for successful reproduction of this important species. The birds often nest in large, prominent snags or trees with broken tops. These trees have a limited life span and are vulnerable to damage from forest practices. When using the nesting sites, the birds are also sensitive to human disturbance.

What is an osprey resource site?

It includes the active nest tree and any identified key components. An active nest tree is one that has been used by osprey within the past five nesting seasons. Key components include perching, fledging and replacement trees.

Osprey are fish-eating raptors. After foraging, an adult osprey eats part of a fish in a tree near the nest, and delivers the remainder to the nest. These same trees are also used as perches by fledglings when learning to fly. Perching and fledging trees tend to be taller and larger in diameter than nest trees and have broken or dead tops, forks or lateral branches high in the crown. They allow easy access and views of the surroundings.

How are osprey resource sites protected?

• The goal is to avoid resource site abandonment or reduced use of the site. It is accomplished by maintaining site integrity and avoiding disturbance during the critical period of use when nest construction, mating and rearing of young occur.

Perching, fledging and replacement trees

> Èight to 12 trees, located near the nest tree, are adequate to provide perching, fledging and replacement trees. Areas of high winds may require that surrounding trees be left to protect the resource site from damage.

Restrict operations March 1 to Sept. 15. Forest operations must not cause birds to flush.

- During forest operations, the active nest tree, perching, fledging and replacement trees must be left and protected from damage. The operation must be designed to protect the trees from windthrow.
- During the critical period of use, the active nest tree and any identified perch trees must be protected from disturbance. Forest operations are not allowed within 600 feet of the active nest tree or perch trees from March 1 to Sept. 15. Seasonal restriction periods can be modified if survey information shows that osprey are not nesting or are not present.
- First, identify the active nest tree. Then choose suitable perching, fledging and replacement trees that are likely to be used by osprey. The trees should be taller than the surrounding forest, with platforms large enough to support nests.
- Resting perches are used by adults when not fishing or tending the nest, and by fledglings when learning to fly. These are large, tall snags or trees that have broken or dead tops, forks or lateral branches high in the crown.
- Eight to 12 trees are adequate for perching, fledging and replacement trees, and should be located near the active nest tree.

• Activities that cause disturbance include timber harvesting, log hauling, road construction and low-flying aircraft.

Are there exceptions?

Yes. There are exceptions to protecting osprey resource sites if ODF determines that the loss of the site will not adversely affect the local population and there are no economically feasible alternatives. Check with ODF.

For other information sources, see the Appendix, pages 197-198.

What about the great-blue heron?

Great-blue herons are colonial nesters, which means there are often many nests together in what's called a rookery. (However, great-blue herons do sometimes nest individually.) Clusters of large nests located near the tops of trees identify a rookery. The rookery is usually near water and is used year after year.

What is a great-blue heron resource site?

It includes the active nest tree and any identified key components. An active nest tree is one that has been used by great-blue herons within the past three nesting seasons. Key components include a forested area around the nest trees that has perching, fledging and replacement trees.

How are great-blue heron resource sites protected?

• The goal is to avoid resource site abandonment or reduced use. It is accomplished by maintaining site integrity and by avoiding disturbance during the critical period of use when nest construction, mating and rearing of young occur.



- During forest operations, the active nest tree, perching, fledging and replacement trees must be left and protected from damage. The operation must be designed to protect the trees from windthrow.
- During the critical period of use, the active nest tree and any key components must be protected from disturbance. Forest operations are not allowed within one-quarter mile of the active nest trees Feb. 15 to July 31. Seasonal restriction periods can be modified if survey information shows that herons are not nesting or are not present.

- First, identify the active nest trees. Then choose a vegetative area around the nest trees. Trees used as nest sites should be tall, with plenty of space for these large birds to fly in and out. Older trees with open branching are ideal. A 300-foot area around the outermost nest trees is needed to give a visual screen around the rookery and protect nest, perch, fledging and replacement trees from windthrow.
- Some trees may be harvested within the vegetative area surrounding the active nest trees. When conducting harvest activities within this area, operators must consider great-blue heron resource protection as the highest priority.
- Activities likely to cause the birds to flush from the nest include timber harvesting, log hauling, road construction and low-flying aircraft.

Are there exceptions?

There are exceptions to protecting a great-blue heron resource site if ODF determines that the loss of the site will not adversely affect the local population and there are no economically feasible alternatives. Check with ODF.



These great-blue heron nests have plenty of space for these large birds to fly in and out. Older trees with open branching are chosen. The resource site includes the nest trees and a forested area around the nest trees that includes perching, fledging and replacement trees.

> From Feb. 15 - July 31, operations are not allowed within one-quarter mile.

What are the requirements for harvesting near scenic highways?

Oregon's popular scenic highways are often bordered by forestlands. When located along certain designated scenic highways, these lands have unique timber harvest requirements to help maintain the public's enjoyment of roadside trees.



Designated scenic highways

These include interstate freeways 5, 84, 205 and 405, plus Oregon state highways 6, 7, 20, 18, 22, 26, 27, 30, 31, 34, 35, 36, 38, 42, 58, 62, 66, 82, 97, 101, 126, 138, 140, 199, 230, 234 and 395.

Are there any exceptions?

Three scenarios are exempt from the scenic highway requirements: timber harvests along highways within urban growth boundaries, harvests on lands zoned as rural residential, or harvests on single ownerships less than 5 acres in size.

What area is affected by the requirements?

The scenic highway requirements apply to the "visually sensitive corridor" that extends 150 feet from the edge of the highway (Area 1 in the illustration). This distance is measured on the slope, along both sides of a scenic highway. The "edge of the highway" means the fence for interstate highways and the outermost edge of the pavement for state highways.

What are the requirements?

The following must be left temporarily on each acre of the 150-foot corridor:

(Note: 1 acre = 290 feet of scenic corridor; $150 \times 290 = approximately 1$ acre.)

Leave at least 50 healthy trees on each acre, at least 11 inches DBH (species are landowner's choice),

Or

Leave at least 50 healthy trees on each acre that are 40 square feet of basal area.

Note: 50 trees/acre = 17 trees per 100 feet of corridor length.

When can the temporary trees be harvested?

The trees may be removed when the new trees in the corridor understory reach an average height of at least 10 feet.

And

there is at least the minimum number of trees per acre of free-to-grow seedlings or saplings required for reforestation. (See "Will you need to reforest after harvest?" on page 75).

THERE IS AN ALTERNATIVE:

When the area extending from 150 to 300 feet from the edge of the highway (Area 2) has at least 40 square feet of basal area

Or

There are at least the minimum number of trees per acre of free-to-grow seedlings or saplings required for reforestation in Area 2 averaging 10

Then

feet tall.

No trees are required to be left in the visually sensitive corridor, or trees initially left may be removed. (See illustration on page 50).

However, if this alternative is used, Area 2 stocking cannot be reduced below 40 square feet of basal area,

Or

Below the minimum number of trees per acre of free-to-grow seedlings or saplings required for reforestation,

Until

Area 1 has been reforested as required and the stand is at least 10 feet tall and has the minimum number of stems per acre.

QUESTION:

What if the stocking in the scenic corridor (Area 1) is already below 50 healthy trees on each acre?

Then Area 2 cannot be harvested until Area 1 has been reforested and the stand has attained an average height of 10 feet,

And

There are at least the minimum of trees per acre of free-to-grow seedlings and saplings required for reforestation.

How is slash managed in visually sensitive corridors?

Harvests in visually sensitive corridors shall be cleared of major harvest debris within 30 days of harvest completion,



Within 60 days of stopping active harvest activity on the site, regardless of whether the harvest is complete.



Da

What are the reforestation requirements in visually sensitive corridors?

When the harvest in a visually sensitive corridor results in a Type 1 or Type 3 harvest, reforestation shall be completed by the end of the first planting season after the completion of the harvest (see harvest types, page 17).

Is there liability for injury or damage from trees left in corridors?

Landowners and operators are not liable for injury or damage caused by the trees left in the visually sensitive corridor to comply with the requirements above. Where public safety is a serious concern, the Oregon Department of Transportation may encourage or prescribe removal of specific trees.

What tree species must be left in the corridor?

The landowner can choose the 50 trees that are left. Hardwoods make good visual screens, so conifers do not have to be left if there are enough hardwoods. The 50 trees on each acre (not an average) are intended to be distributed throughout the visual corridor.



AREA 1

AREA 2





Are modifications or waivers granted?

Yes, ODF may do so when the following circumstances exist:

- to maintain motorist safety
- · to protect improvements such as dwellings or bridges
- · to protect forest health
- · to provide the motoring public with exposure to distant scenic vistas
- when trees that are required to be left are not visible to motorists
- · when a land use change is inconsistent with a visually sensitive corridor
- when the requirements will result in severe economic hardship for the owner because nearly all of the owner's property is within the corridor

For other information sources, see the Appendix, pages 197-198.

AREA 2

What are the requirements where rapidly moving landslides may occur?

What is the problem on very steep slopes in western Oregon?

Very steep slopes can be prone to rapidly moving landslides, and timber harvesting and road construction can affect their occurrence. In addition to their potential soil and water effects, they can pose significant threats to public safety. This section describes rapidly moving landslides, where they can occur and requirements for forest practices near such areas. These measures are only one part of the shared responsibility needed among homeowners, road users, and state and local governments for effective protection of the public in areas prone to these landslides.

What is a rapidly moving landslide?

Rapidly moving landslides begin as small landslides on very steep slopes, averaging about 3 feet deep, 30 feet wide and 40 feet long. When these landslides move down steep slopes and into stream channels they are called debris flows or debris torrents. They can affect fish habitat both positively and negatively. They carry logs and boulders, which provide nutrients and contribute hiding cover for fish, but the fine sediment can suffocate fish eggs and emerging fry. If people, homes or buildings are anywhere in their path, serious harm can occur. Other landslides, such as deep-seated earthflows, move more slowly and are not considered rapidly moving landslides.



Scars left by rapidly moving landslides.



Very steep slopes and steep headwalls or draws are prone to landslides.

Where are the high landslide hazard locations?

"High landslide hazard location" (sometimes abbreviated HLHL) refers to a steep area that is likely to be the starting point of a rapidly moving landslide. These locations are:

A. any slope in western Oregon steeper than 80 percent, except in the Tyee core area, where it is any slope steeper than 75 percent (see illustration),

Or

B. headwalls or draws in western Oregon steeper than 70 percent, except in the Tyee core area, where it is any headwall or draw slope steeper than 65 percent (see illustration),

Or

C. a steep slope in any part of the state determined in the field by a geotechnical specialist and confirmed by ODF to have conditions with a landslide hazard equivalent to A or B.

What if your timber harvest or road construction project is located near a high landslide hazard location?

Landowners and operators are responsible for identifying high landslide hazard locations in the activity area, identifying roads, homes and other structures below the activity area, and



The Tyee core area includes parts of Coos, western Lane and western Douglas counties. It stretches from the Siuslaw watershed south to and including the Coquille watershed. It also includes that portion of the Umpqua watershed north of Highway 42 and west of Interstate 5.



What is the Tyee core area?

The Tyee core area is a portion of Oregon where the geology consists of thick sandstone beds beneath the soil surface. These sandstone beds decompose rapidly and have very few underground cracks where soil water can enter. As a result, their shallow soils can become waterlogged and slip off the steep slopes, creating rapidly moving landslide hazards. There are exceptions, however, and geotechnical specialists find slopes that do not have these susceptible characteristics and are not subject to the Tyee slope restrictions.

Table 2-20 Operations in High Landslide Hazard Locations		
Downslope Public Safety Risk Level	Requirements	Restrictions
High	Written plan and geotechnical report to ODF	Harvesting or new road construction is not allowed in certain locations
Intermediate	Written plan to ODF; site-specific measures	Limit on how much area can be harvested
Low	Identify downslope structures and public roads in notification to ODF	No ground-based equipment, skid roads or serious ground disturbance Avoid roads in these locations; direct drainage water away from them

Table 2-20 describes major restrictions and requirements for the different levels of downslope public safety risk. You may need a written plan and, in some cases, assistance from a geotechnical specialist to assess and plan the operation. See page 53 for examples of some important factors that can determine local risks.

evaluating the level of risk to public safety. You may need a geotechnical specialist to assist with some or all of these tasks. ODF will review and verify the information you provide and make the final determination of the level of risk to public safety. Table 2-20 describes the restrictions and requirements depending on the level of risk. See below for more details about risk levels.

Determining public safety risk is complex and sensitive work. It is extremely important to work closely with ODF, starting in the planning stages for a harvest or road construction project, if public safety related to landslides may be a concern.

How can streams in high landslide hazard locations affect risk?

Streams that drain high landslide hazard locations can be prone to debris torrents – such streams are often found squeezed into narrow channels with steep sideslopes. When large quantities of debris from a landslide reaches such a channel, the torrent can become even more damaging as it scours additional material from the channel and moves rapidly toward the lower watershed.

If there's a potential public safety risk around these channels, you may be required to leave large trees along streams in locations where they might slow debris torrent movement. Where public safety is not a concern, leaving trees around these channels can provide an important source of large wood that provides good fish habitat.

What locations are most risky for people?

How much time people spend in the locations, especially during wet-season storms, is a key risk factor. People in homes or buildings that are in the path of rapidly moving landslides are at highest risk. People traveling on busy roads with this hazard have less risk. Most other circumstances have a low risk.

What about small Type N streams subject to rapidly moving landslides?

Landslide deposits in stream channels that contain large woody debris can benefit fish by improving spawning and rearing habitat and other local conditions. For small Type N streams subject to rapidly moving landslides, some or all of the green trees and snags required for Type 2 or Type 3 harvests larger than 25 acres must be left within 50 feet of these channels for the first 500 feet that drains into a Type F stream. Downslope public safety requirements can supersede this directive, and operators may propose alternate practices (e.g., placing wood in the Type F stream) to meet the same objective. Contact ODF for further details and assistance.

For other information sources, see the Appendix, pages 197-198.



The home at the right is on a debris fan at the base of a debris torrent-prone stream that is susceptible to landslides originating in the canyon behind it. Thus, it has a higher risk than the home at left that is below a single, uniform steep slope.

This landslide had no sharp channel junctions and moved and grew rapidly, causing considerable damage. This slide stopped when it hit a sharp right angle. This limited damage and, over time, local fish habitat may be improved.



This illustration shows the action of two landslides. Landowners who conduct operations on slopes need to evaluate the potential for landslides. Many locations prone to rapidly moving landslides contain no obvious evidence of prior landslides.