TECHNICAL NOTES

U.S. Department of Agriculture Portland, Oregon Soil Conservation Service

Forestry No. 5 October 1994

Summary of Oregons's Water Protection Rules and General Prescriptions

This Technical Note provides a summary of the Oregon Department of Forestry Water Protection Rules that went in to effect September 1, 1994. Also included is a series of General Prescriptions for typical situations involving various stream sizes, harvest methods and geographic locations.

The purpose of the Water Protection Rules is to protect, maintain and, where apprpriate, improve the functions and values of streams, lakes, wetlands, and riparian management areas. These functions and values include water quality, hydrologic functions, the growing and harvesting of trees, and fish and wildlife resources.

The goal of the Water Protection Rules is to provide resource protection during operations adjacent to and within streams, lakes, wetlands and riparian management areas so that, while continuing to grow and harvest trees, the protection goals for fish, wildlife, and water quality are met.

The protection goal for water quality is to ensure that, to the maximum extent practicable, non-point source discharges of pollutants resulting from forest operations do not impair the achievement and maintenance of the water quality standards.

The protection goal for fish is to establish and retain vegetation that will maintain water quality and provide aquatic habitat components and functions such as shade, large woody debris, and nutrients.

The protection goal for wildlife is to establish and retain vegetation that will maintain water quality and habitat components such as live trees of various species and size classes, shade, snags, downed wood, and food within riparian management areas.

SUMMARY OF THE NEW WATER PROTECTION RULES
OREGON DEPARTMENT OF FORESTRY
August 1, 1994

PURPOSE
The purpose of this summary is to give you a broad framework to understand the new water protection rules that will take effect on September 1, 1994. If you want to know protection requirements for a particular stream please attend one of our training sessions or contact your local Oregon Department of Forestry office.

WHY DO WE HAVE NEW WATER PROTECTION RULES?
Stream protection was one of the concerns discussed in the 1990 Forest Practices Forum held by the Oregon Board of Forestry. Then, in 1991, the Oregon Legislature passed a law requiring the Board to review current stream rules to see if protection was adequate, and revise the rules if the review showed it to be necessary. At the direction of the Board, the Oregon Department of Forestry worked with technical specialists, landowners, operators, state agencies, environmental groups, and the public to produce a set of water protection rules, which the Board approved.

GOAL OF THE NEW RULES
The overall goal of the new rules is to allow growing and harvesting of timber, while protecting fish and wildlife habitat, and water quality. The rules direct that this goal will be met by growing and maintaining vegetation along streams to establish mature forest conditions in streamside stands. Growing and keeping large conifers along streams is especially important.

DEFINITIONS
There are a few definitions that you need to know to understand the new rules.

- Basal area--the area in square feet of the stump surface of a tree if it were cut off about chest high.

- Domestic use--where people use stream water for drinking or cooking. Protection of a stream as a domestic water source is required only if there is a water use permit registered with the Water Resources Department.

- Stream--has banks, and a bed that runs water during some portion of the year. Includes the bed, banks, side channels, beaver ponds, and adjacent wetlands.

- Riparian Management Area (RMA)--area along water bodies where the rules require forest components such as trees, snags, and understory vegetation to be left. RMA widths are usually measured in slope distance (horizontal distance on very steep slopes), and are measured separately on each side of streams.

STREAM CLASSIFICATION

Streams will be classified as small, medium, and large. These sizes refer to average stream flow, which can be estimated by measuring drainage areas and using rainfall measurements for different regions. Most stream sizes have already been measured.

Streams will be further classified by use. Streams used by game fish, or by fish and for domestic use, are called **Type F**. Streams with domestic use, but no game fish, are called **Type D**. Finally, streams which have neither game fish nor domestic use are called **Type N**.

Size and use will be combined to get a classification for each stream. For example, a medium sized stream with game fish would be called a "medium F stream." By September 1, 1994, Department of Forestry offices will have maps showing most stream classifications.

RIPARIAN MANAGEMENT AREAS

Riparian management areas, known as RMA's, are areas along streams where the rules require forest components such as trees, snags, and understory vegetation to be left. This does **not** mean you must always leave everything within the RMA width; on most streams the rules allow some management inside the RMA. Table 1 below shows stream classifications and RMA widths.

Table 1: STREAM TYPES AND RMA WIDTHS

	TYPE F (fish, or fish and domestic use)	TYPE D (domestic use, no fish)	TYPE N (no fish, no domestic use)
Large	RMA 100 feet	RMA 70 feet	RMA 70 feet
Medium	70 feet	50 feet	50 feet
Small	50 feet	20 feet	none

STREAM PROTECTION

The rules are designed to adapt to local stream conditions and landowner objectives. What must be left within the RMA varies with stream classification, the region the stream is in, and conditions in the RMA before harvest. Table 2 on page 3 shows the options a landowner has under different RMA conditions. Pages 4 and 5 summarize the protection requirements for each option.

Table 2: HOW DO YOU USE CHOOSE A STREAM PROTECTION OPTION?

HOW MUCH CONIFER BASAL AREA IS IN THE RMA? Is it considered "adequate," or not ("adequate" is defined numerically in tables in the rules)?

IF STOCKING IS "ADEQUATE,": Use the General Prescription.	**IF STOCKING IS NOT "ADEQUATE",** you may use an Alternate Prescription.
1. -Leave enough live conifer basal area to meet minimum requirements listed in rule tables. -OR-	**CAN CONIFERS BE GROWN ON THE SITE?** If they can, your choices are:
2. On Type F streams, you can leave fewer live conifers if you do stream improvement work (Example: place logs in the stream). -OR-	1. Use Alternative Prescription #1 where the stand has been damaged by wind, insects, disease, or fire. -OR-
3. On small N streams there is no RMA, so you don't have to leave merchantable trees.	2. Use Alternative Prescription #2 where stand is dominated by hardwoods (example: mostly alder and very few conifers in the RMA) and conifers can be grown on the site.
	IF YOU DON'T WANT TO OR CANNOT USE ALTERNATIVE PRESCRIPTION #1 OR #2: Apply the Default Standard in the General Prescription (leave all conifers and hardwoods within distances specified in the rules).

Use a Site Specific Prescription:
You can always propose your own plan (Site Specific Plan) for any stream. The Forest Practices Forester will review the plan to see if it meets the stream protection goals.

DESCRIPTIONS OF STREAM PROTECTION OPTIONS FROM TABLE 2

GENERAL PRESCRIPTION To be used when there is "adequate" conifer stocking in the RMA.

- Except for yarding corridors or stream crossings, leave:
  -All trees within 20 feet of the stream.
  -All trees in the RMA that lean over the stream.
  -All understory plants within 10 feet of the stream.
  -All snags and down wood in the channel and RMA (Safety or fire hazards may be felled, but can't be removed).

- Leave a minimum number of live conifers in the RMA. Large F: 40 per 1,000 feet; large D or N, and medium F: 30 per 1,000 feet; medium D or N: 10 per 1,000 feet; small: no minimum.

- Leave a minimum amount of live conifer basal area in the RMA. The minimum varies with stream type.
  -For F streams, the minimum can be reduced in exchange for stream improvement work done as part of a plan approved by the Forestry Department.
  -For some streams, large hardwoods (excluding alder) more than 20 feet from the stream, and sound snags can count for some of the conifer basal area.

- Within 10 feet of some small year-round N streams, leave all trees less than 6 inches DBH, and all understory vegetation. This varies with geographic region (coast, interior, etc.).

ALTERNATIVE PRESCRIPTIONS To be used when there is not "adequate" conifer stocking, and the site can grow conifers.

- Intent--protect the stream while growing a new conifer stand.

- Can't be used on small D or small N streams.

Alternative Prescription #1: Catastrophic tree death or damage (wind, fire, insects, disease, etc.) over an entire stand.

- Leave enough of the following to meet minimum basal area amounts:
  -All down trees in the stream. Logs can be cut off portions of trees if stability of the tree in the stream is not reduced.
  -All live and dead trees within 20 feet of all medium and large streams, and within 10 feet of small F streams.

DESCRIPTIONS OF STREAM PROTECTION OPTIONS FROM TABLE 2
(continued)

Alternative Prescription #2: Hardwood dominated sites. Can be used only in western Oregon.

- -Separate out sections (minimum 200 feet long) of RMA that have "good" conifer stocking, and apply the General Prescription on those sections.

- Divide the rest of the RMA into "conversion" and "retention" blocks.
  -Conversion blocks:
    -Leave everything within 10 feet of the stream (plus trees within 20 feet that lean over large streams).
    -The total length in conversion blocks can't be any more than 1/2 the stream length in the harvest unit.
  -Retention blocks:
    -Leave all trees within distances ranging from 20 to 50 feet, depending on the stream type.

DEFAULT STANDARD To be used when there is not "adequate" conifer stocking, and (1) the site will not grow conifers, or (2) the landowner chooses not to apply the alternate prescriptions.

- Except for yarding corridors or stream crossings, leave:
  -All trees in the RMA that lean over the stream.
  -All understory plants within 10 feet of the stream.
  -All snags and down wood in the channel and RMA (Safety or fire hazards may be felled, but can't be removed).

- Leave all conifers within specified distances, which vary from 20 to 100 feet, depending on the stream classification.

- Leave all hardwoods within specified distances, which vary from 20 to 50 feet, depending on the stream classification.

OTHER NEW REQUIREMENTS

- Except for approved crossings, channel changes are not allowed even on very small channels that are dry in the summer.

- Except for road maintenance, removal of most beaver dams on forest land is not allowed.

- New culverts must maintain adult and juvenile fish passage, and must be designed for the 50 year storm event.

LAKES AND WETLANDS

Lakes have year round standing water. Wetlands are areas that have enough surface or ground water to support wet-soil vegetation, such as rushes or skunk cabbage. Wetlands may dry out in the summer. Tables 3 and 4 show the classifications and protection requirements for lakes and wetlands.

Table 3: LAKE CLASSIFICATION AND PROTECTION

Classification	RMA	Protection (Lake and RMA)
LARGE = greater than 8 acres	100 feet	-Leave understory plants, all snags and down wood, and 1/2 of the trees by species and size -Don't drain lake or cause sedimentation
OTHER, between 8 acres and 1/2 acre, or less than 8 acres and has fish	50 feet	Same as for LARGE
OTHER, less than 1/2 acre, no fish	No RMA	-Don't drain lake or cause sedimentation -If greater than 1/4 acre leave snags and down wood

Table 4: WETLAND CLASSIFICATION AND PROTECTION

Classification	RMA	Protection (wetland and RMA)
SIGNIFICANT = greater than 8 acres, or estuaries, bogs, or certain Eastern Oregon springs	Varies from 50 to 200 feet	-Leave requirements same as for LARGE lakes -Don't drain wetland or cause sedimentation
STREAM ASSOCIATED = next to a stream	Stream RMA goes around it	-Included in stream RMA
OTHER = less than 8 acres	No RMA	-Don't drain wetland or cause sedimentation - If greater than 1/4 acre leave snags and down wood

WATER PROTECTION RULES
GENERAL PRESCRIPTION
VEGETATION RETENTION RULE
SUMMARIES

Taken from the August 1994
Landowner/Operator Training Manual

Type F Streams

Clearcut Harvest-Westside . . . . . Green Pages

Partial Harvest or Thinning-Westside . . . . . Blue Pages

Clearcut Harvest-East Side . . . . . Yellow Pages

Partial Harvest or Thinning-East Side . . . . . Pink Pages

Type D and Type N Streams

Clearcut Harvest-Westside . . . . . Green Pages

Partial Harvest or Thinning-Westside . . . . . Blue Pages

Clearcut Harvest-East Side . . . . . Yellow Pages

Partial Harvest or Thinning-East Side . . . . . Pink Pages

Summary of vegetation retention requirements for Type F streams that have good conifer stocking.

The following are one-page summaries of the vegetation retention requirements along Type F streams that have good conifer stocking. Each page contains the requirements for a single stream type.

Separate pages are included for:

Clearcut vs. partial harvest (or thinning)

West side vs. east side geographic regions.

General prescription for vegetation retention along streams with good conifer stocking -- Live conifer basal area in the RMA (square feet per 1000 feet) is greater than 115 for Coast Range and South Coast, greater than 135 for Interior and Western Cascades, or greater than 110 for Siskiyou geographic regions:

LARGE TYPE F STREAM CLEARCUT HARVEST

RMA width = 100 feet

Do the following each side of stream:

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

West Side Geographic Regions

Geographic Region	SQUARE FEET OF BASAL AREA PER 1000 FEET OF STREAM	
	Standard Target	Active Mgt. Target
Coast Range & South Coast	230	170
Interior & West. Cascades	270	200
Siskiyou	220	170

- Retain all snags and downed wood in the channel and RMA.
- Retain no fewer than 40 live conifer trees (greater than 11 inches DBH) per 1000 feet within the RMA.
- Retain enough conifer basal area within the RMA to meet the **standard target.**

  OR Retain less conifer basal area than is indicated in the standard target and place conifer logs in the channel to create fish habitat. For each conifer log placed in the channel the target is reduced by twice the basal area of the log. But the amount of retained conifer basal area cannot be reduced below the **active management target.**

Note: All cottonwood and Oregon ash trees (6 inches or greater DBH) retained in the RMA but growing more than 20 feet from the high water mark may count toward the basal area target.

A combination of the following can make up to 10 percent of the basal area target:

- The basal area of hardwoods (other than alder, cottonwood, and Oregon ash) retained in the RMA that are greater than 24 inches DBH but growing more than 20 feet from the high water mark;

- The basal area of sound snags (6 inches or greater DBH and at least 30 feet high) that are anywhere within the RMA.

Conifers retained in the RMA in excess of the active management target and hardwoods retained beyond 20 feet of the channel may be counted towards requirements for leave trees within clearcuts, as long as they meet the other requirements for leave trees.

General prescription for vegetation retention along streams with good conifer stocking -- Live conifer basal area in the RMA (square feet per 1000 feet) is greater than 60 for Coast Range and South Coast, greater than 70 for Interior and Western Cascades, or greater than 55 for Siskiyou geographic regions:

MEDIUM TYPE F STREAM CLEARCUT HARVEST

RMA width = 70 feet

Do the following each side of stream:

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

West Side Geographic Regions

Geographic Region	SQUARE FEET OF BASAL AREA PER 1000 FEET OF STREAM	
	Standard Target	Active Mgt. Target
Coast Range & South Coast	120	90
Interior & West. Cascades	140	110
Siskiyou	110	90

- Retain all snags and downed wood in the channel and RMA.
- Retain no fewer than 30 live conifer trees (greater than 8 inches DBH) per 1000 feet within the RMA.
- Retain enough conifer basal area within the RMA to meet the **standard target.**

  OR Retain less conifer basal area than is indicated in the standard target and place conifer logs in the channel to create fish habitat. For each conifer log placed in the channel the target is reduced by twice the basal area of the log. But the amount of retained conifer basal area cannot be reduced below the **active management target.**

Note: A combination of the following can make up to 10 percent of the basal area target:

- The basal area of hardwoods (other than alder) retained in the RMA that are greater than 24 inches DBH but growing more than 20 feet from the high water mark;

- The basal area of sound snags (6 inches or greater DBH and at least 30 feet high) that are anywhere within the RMA.

Conifers retained in the RMA in excess of the active management target and hardwoods retained beyond 20 feet of the channel may be counted towards requirements for leave trees within clearcuts, as long as they meet the other requirements for leave trees.

General prescription for vegetation retention along streams with good conifer stocking -- Live conifer basal area in the RMA (square feet per 1000 feet) is greater than 20:

SMALL TYPE F STREAM CLEARCUT HARVEST

RMA width = 50 feet

Do the following each side of stream:

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

West Side Geographic Regions

Geographic Region	SQUARE FEET OF BASAL AREA PER 1000 FEET OF STREAM	
	Standard Target	Active Mgt. Target
Coast Range & South Coast	40	20
Interior & West. Cascades	40	20
Siskiyou	40	20

- Retain all snags and downed wood in the channel and RMA.
- Retain enough conifer basal area within the RMA to meet the **standard target.**

  OR Retain less conifer basal area than is indicated in the standard target and place conifer logs in the channel to create fish habitat. For each conifer log placed in the channel the target is reduced by the basal area of the log. But the amount of retained conifer basal area cannot be reduced below the **active management target.**

Note: A combination of the following can make up to 10 percent of the basal area target:

- The basal area of hardwoods (other than alder) retained in the RMA that are greater than 24 inches DBH but growing more than 20 feet from the high water mark;

- The basal area of sound snags (6 inches or greater DBH and at least 30 feet high) that are anywhere within the RMA.

All conifers and hardwoods retained in the RMA may be counted towards requirements for leave trees within clearcuts, as long as they meet the other requirements for leave trees.

General prescription for vegetation retention along streams with good conifer stocking -- Live conifer basal area in the RMA (square feet per 1000 feet) is greater than 115 for Coast Range and South Coast, greater than 135 for Interior and Western Cascades, and greater than 110 for Siskiyou geographic regions:

LARGE TYPE F STREAM PARTIAL HARVEST OR THINNING

RMA width = 100 feet

Do the following each side of stream:

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

West Side Geographic Regions

Geographic Region	SQUARE FEET OF BASAL AREA PER 1000 FEET OF STREAM	
	Standard Target	Active Mgt. Target
Coast Range & South Coast	300	270
Interior & West. Cascades	350	310
Siskiyou	290	260

- Retain all snags and downed wood in the channel and RMA.
- Retain no fewer than 40 live conifer trees (greater than 11 inches DBH) per 1000 feet within the RMA.
- Retain enough conifer basal area within the RMA to meet the **standard target.**

  OR Retain less conifer basal area than is indicated in the standard target and place conifer logs in the channel to create fish habitat. For each conifer log placed in the channel the target is reduced by twice the basal area of the log. But the amount of retained conifer basal area cannot be reduced below the **active management target.**

Note: All cottonwood and Oregon ash trees (6 inches or greater DBH) retained in the RMA but growing more than 20 feet from the high water mark may count toward the basal area target.

A combination of the following can make up to 10 percent of the basal area target:

- The basal area of hardwoods (other than alder, cottonwood, and Oregon ash) retained in the RMA that are greater than 24 inches DBH but growing more than 20 feet from the high water mark;

- The basal area of sound snags (6 inches or greater DBH and at least 30 feet high) that are anywhere within the RMA.

General prescription for vegetation retention along streams with good conifer stocking -- Live conifer basal area in the RMA (square feet per 1000 feet) is greater than 60 for Coast Range and South Coast, greater than 70 for Interior and Western Cascades, and greater than 55 for Siskiyou geographic regions:

MEDIUM TYPE F STREAM PARTIAL HARVEST OR THINNING

RMA width = 70 feet

Do the following each side of stream:

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

West Side Geographic Regions

Geographic Region	SQUARE FEET OF BASAL AREA PER 1000 FEET OF STREAM	
	Standard Target	Active Mgt. Target
Coast Range & South Coast	160	140
Interior & West. Cascades	180	160
Siskiyou	140	120

- Retain all snags and downed wood in the channel and RMA.
- Retain no fewer than 30 live conifer trees (greater than 8 inches DBH) per 1000 feet within the RMA.
- Retain enough conifer basal area within the RMA to meet the **standard target.**

  OR Retain less conifer basal area than is indicated in the standard target and place conifer logs in the channel to create fish habitat. For each conifer log placed in the channel the target is reduced by twice the basal area of the log. But the amount of retained conifer basal area cannot be reduced below the **active management target.**

Note: A combination of the following can make up to 10 percent of the basal area target:

- The basal area of hardwoods (other than alder) retained in the RMA that are greater than 24 inches DBH but growing more than 20 feet from the high water mark;

- The basal area of sound snags (6 inches or greater DBH and at least 30 feet high) that are anywhere within the RMA.

General prescription for vegetation retention along streams with good conifer stocking -- Live conifer basal area in the RMA (square feet per 1000 feet) is greater than 20:

SMALL TYPE F STREAM PARTIAL HARVEST OR THINNING

RMA width = 50 feet

Do the following each side of stream:

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

West Side Geographic Regions

Geographic Region	SQUARE FEET OF BASAL AREA PER 1000 FEET OF STREAM	
	Standard Target	Active Mgt. Target
Coast Range & South Coast	50	30
Interior & West. Cascades	50	30
Siskiyou	50	30

- Retain all snags and downed wood in the channel and RMA.
- Retain enough conifer basal area within the RMA to meet the **standard target.**

  OR Retain less conifer basal area than is indicated in the standard target and place conifer logs in the channel to create fish habitat. For each conifer log placed in the channel the target is reduced by the basal area of the log. But the amount of retained conifer basal area cannot be reduced below the **active management target.**

Note: A combination of the following can make up to 10 percent of the basal area target:

- The basal area of hardwoods (other than alder) retained in the RMA that are greater than 24 inches DBH but growing more than 20 feet from the high water mark;

- The basal area of sound snags (6 inches or greater DBH and at least 30 feet high) that are anywhere within the RMA.

General prescription for vegetation retention along streams with good conifer stocking -- Live conifer basal area in the RMA (square feet per 1000 feet) is greater than 85:

LARGE TYPE F STREAM CLEARCUT HARVEST

RMA width = 100 feet

Do the following each side of stream:

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

East Side Geographic Regions

Geographic Region	SQUARE FEET OF BASAL AREA PER 1000 FEET OF STREAM	
	Standard Target	Active Mgt. Target
Eastern Cascades	170	130
Blue Mountains	170	130

- Retain all snags and downed wood in the channel and RMA.
- Retain no fewer than 40 live conifer trees (greater than 11 inches DBH) per 1000 feet within the RMA.
- Retain enough conifer basal area within the RMA to meet the **standard target.**

  OR Retain less conifer basal area than is indicated in the standard target and place conifer logs in the channel to create fish habitat. For each conifer log placed in the channel the target is reduced by twice the basal area of the log. But the amount of retained conifer basal area cannot be reduced below the **active management target.**

Note: All hardwoods (6 inches or greater DBH) retained in the RMA may count toward the basal area target.

Sound conifer snags (6 inches or greater DBH and at least 30 feet high) retained in the RMA may count toward as much as 10 percent of the basal area target.

Conifers retained in the RMA in excess of the active management target and hardwoods retained beyond 20 feet of the channel may be counted towards requirements for leave trees within clearcuts, as long as they meet the other requirements for leave trees.

General prescription for vegetation retention along streams with good conifer stocking -- Live conifer basal area in the RMA (square feet per 1000 feet) is greater than 45:

MEDIUM TYPE F STREAM CLEARCUT HARVEST

RMA width = 70 feet

Do the following each side of stream:

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

East Side Geographic Regions

Geographic Region	SQUARE FEET OF BASAL AREA PER 1000 FEET OF STREAM	
	Standard Target	Active Mgt. Target
Eastern Cascades	90	70
Blue Mountains	90	70

- Retain all snags and downed wood in the channel and RMA.
- Retain no fewer than 30 live conifer trees (greater than 8 inches DBH) per 1000 feet within the RMA.
- Retain enough conifer basal area within the RMA to meet the **standard target.**

  OR Retain less conifer basal area than is indicated in the standard target and place conifer logs in the channel to create fish habitat. For each conifer log placed in the channel the target is reduced by twice the basal area of the log. But the amount of retained conifer basal area cannot be reduced below the **active management target.**

Note: All hardwoods (6 inches or greater DBH) retained in the RMA may count toward the basal area target.

Sound conifer snags (6 inches or greater DBH and at least 30 feet high) retained in the RMA may count toward as much as 10 percent of the basal area target:

Conifers retained in the RMA in excess of the active management target and hardwoods retained beyond 20 feet of the channel may be counted towards requirements for leave trees within clearcuts, as long as they meet the other requirements for leave trees.

General prescription for vegetation retention along streams with good conifer stocking -- Live conifer basal area in the RMA (square feet per 1000 feet) is greater than 20:

SMALL TYPE F STREAM CLEARCUT HARVEST

RMA width = 50 feet

Do the following each side of stream:

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

East Side Geographic Regions

Geographic Region	SQUARE FEET OF BASAL AREA PER 1000 FEET OF STREAM	
	Standard Target	Active Mgt. Target
Eastern Cascades	50 (40 of live conifer)	50 (30 of live conifer)
Blue Mountains	50 (40 of live conifer)	50 (30 of live conifer)

- Retain all snags and downed wood in the channel and RMA.
- Retain enough conifer basal area within the RMA to meet the **standard target.**

  OR Retain less conifer basal area than is indicated in the standard target and place conifer logs in the channel to create fish habitat. For each conifer log placed in the channel the target is reduced by the basal area of the log. But the amount of retained conifer basal area cannot be reduced below the **active management target.**

Note: No more than 40 square feet per 1000 feet of the standard target or 30 square feet per 1000 feet of active management target is required to be live conifer. The remainder of the target is to be met by the basal area of retained snags, dead or dying trees, or hardwoods if they are available.

All hardwoods (6 inches or greater DBH) retained in the RMA may count toward the basal area target.

Sound conifer snags (6 inches or greater DBH and at least 30 feet high) retained in the RMA may count toward as much as 10 percent of the basal area target.

All conifers and hardwoods retained in the RMA may be counted towards requirements for leave trees within clearcuts, as long as they meet the other requirements for leave trees.

General prescription for vegetation retention along streams with good conifer stocking -- Live conifer basal area in the RMA (square feet per 1000 feet) is greater than 85:

LARGE TYPE F STREAM PARTIAL HARVEST OR THINNING

RMA width = 100 feet

East Side Geographic Regions

Geographic Region	SQUARE FEET OF BASAL AREA PER 1000 FEET OF STREAM	
	Standard Target	Active Mgt. Target
Eastern Cascades	220	200
Blue Mountains	220	200

Do the following each side of stream:

- Retain all understory vegetation within 10 feet of the high water level.
- Retain all trees within 20 feet of the high water level.
- Retain all trees that lean over the channel and grow in the RMA.
- Retain all snags and downed wood in the channel and RMA.
- Retain no fewer than 40 live conifer trees (greater than 11 inches DBH) per 1000 feet within the RMA.
- Retain enough conifer basal area within the RMA to meet the **standard target.**

  OR Retain less conifer basal area than is indicated in the standard target and place conifer logs in the channel to create fish habitat. For each conifer log placed in the channel the target is reduced by twice the basal area of the log. But the amount of retained conifer basal area cannot be reduced below the **active management target.**

Note: All hardwoods (6 inches or greater DBH) retained in the RMA may count toward the basal area target.

Sound conifer snags (6 inches or greater DBH and at least 30 feet high) retained in the RMA may count toward as much as 10 percent of the basal area target.

General prescription for vegetation retention along streams with good conifer stocking -- Live conifer basal area in the RMA (square feet per 1000 feet) is greater than 45:

MEDIUM TYPE F STREAM PARTIAL HARVEST OR THINNING

RMA width = 70 feet

Do the following each side of stream:

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

East Side Geographic Regions

Geographic Region	SQUARE FEET OF BASAL AREA PER 1000 FEET OF STREAM	
	Standard Target	Active Mgt. Target
Eastern Cascades	120	100
Blue Mountains	120	100

- Retain all snags and downed wood in the channel and RMA.
- Retain no fewer than 30 live conifer trees (greater than 8 inches DBH) per 1000 feet within the RMA.
- Retain enough conifer basal area within the RMA to meet the **standard target.**

  OR Retain less conifer basal area than is indicated in the standard target and place conifer logs in the channel to create fish habitat. For each conifer log placed in the channel the target is reduced by twice the basal area of the log. But the amount of retained conifer basal area cannot be reduced below the **active management target.**

Note: All hardwoods (6 inches or greater DBH) retained in the RMA may count toward the basal area target.

Sound conifer snags (6 inches or greater DBH and at least 30 feet high) retained in the RMA may count toward as much as 10 percent of the basal area target.

General prescription for vegetation retention along streams with good conifer stocking -- Live conifer basal area in the RMA (square feet per 1000 feet) is greater than 20:

SMALL TYPE F STREAM PARTIAL HARVEST OR THINNING

RMA width = 50 feet

Do the following each side of stream:

- Retain all understory vegetation within 10 feet of the high water level.
- Retain all trees within 20 feet of the high water level.
- Retain all trees that lean over the channel and grow in the RMA.
- Retain all snags and downed wood in the channel and RMA.

East Side Geographic Regions

Geographic Region	SQUARE FEET OF BASAL AREA PER 1000 FEET OF STREAM	
	Standard Target	Active Mgt. Target
Eastern Cascades	50 (40 of live conifer)	50 (30 of live conifer)
Blue Mountains	50 (40 of live conifer)	50 (30 of live conifer)

- Retain enough conifer basal area within the RMA to meet the **standard target.**

  OR Retain less conifer basal area than is indicated in the standard target and place conifer logs in the channel to create fish habitat. For each conifer log placed in the channel the target is reduced by the basal area of the log. But the amount of retained conifer basal area cannot be reduced below the **active management target.**

Note: No more than 40 square feet per 1000 feet of the standard target or 30 square feet per 1000 feet of the active management target is required to be live conifer. The remainder of the target is to be met by the basal area of retained snags, dead or dying trees, or hardwoods if they are available.

All hardwoods (6 inches or greater DBH) retained in the RMA may count toward the basal area target.

Sound conifer snags (6 inches or greater DBH) retained in the RMA may count toward as much as 10 percent of the basal area target.

Summary of vegetation retention requirements along Type D and Type N streams that have good conifer stocking.

The following are one-page summaries of the vegetation retention requirements along Type D and Type N streams that have good conifer stocking. Each page contains the requirements for a single stream type.

Separate pages are included for:

Clearcut vs. partial harvest (or thinning)

West side vs. east side geographic regions.

General prescription for vegetation retention along streams with good conifer stocking -- Live conifer basal area in the RMA (square feet per 1000 feet) is greater than 45 for Coast Range, South Coast, and Siskiyou, or greater than 55 for Interior and Western Cascades geographic regions:

LARGE TYPE D OR TYPE N STREAM CLEARCUT HARVEST

RMA width = 70 feet

Do the following each side of stream:

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

West Side Geographic Regions

Geographic Region	SQUARE FEET OF BASAL AREA PER 1000 FEET OF STREAM
	Standard Target
Coast Range & South Coast	90
Interior & West. Cascades	110
Siskiyou	90

- Retain all snags and downed wood in the channel and RMA.
- Retain no fewer than 30 live conifer trees (greater than 11 inches DBH) per 1000 feet within the RMA.
- Retain enough conifer basal area within the RMA to meet the **standard target.**

Note: All cottonwood and Oregon ash trees (6 inches or greater DBH) retained in the RMA but growing more than 20 feet from the high water mark may count toward the basal area target.

A combination of the following can make up to 10 percent of the basal area target:

- The basal area of hardwoods (other than alder, cottonwood, and Oregon ash) retained in the RMA that are greater than 24 inches DBH but growing more than 20 feet from the high water mark;

- The basal area of sound snags (6 inches or greater DBH and at least 30 feet high) that are anywhere within the RMA.

All conifers and hardwoods retained in the RMA may be counted towards requirements for leave trees within clearcuts, as long as they meet the other requirements for leave trees.

General prescription for vegetation retention along streams with good conifer stocking -- Live conifer basal area in the RMA (square feet per 1000 feet) is greater than 25:

MEDIUM TYPE D OR TYPE N STREAM CLEARCUT HARVEST

RMA width = 50 feet

Do the following each side of stream:

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

West Side Geographic Regions

Geographic Region	SQUARE FEET OF BASAL AREA PER 1000 FEET OF STREAM
	Standard Target
Coast Range & South Coast	50
Interior & West. Cascades	50
Siskiyou	50

- Retain all snags and downed wood in the channel and RMA.
- Retain no fewer than 10 live conifer trees (greater than 8 inches DBH) per 1000 feet within the RMA.
- Retain enough conifer and hardwood basal area within the RMA to meet the **standard target.**

Note: Hardwood trees retained in the RMA can contribute up to a maximum of 30 square feet of basal area per 1000 feet towards meeting the standard target.

Sound conifer snags (6 inches or greater DBH and at least 30 feet high) can make up as much as 5 percent of the standard target.

All conifers and hardwoods retained in the RMA may be counted towards requirements for leave trees within clearcuts, as long as they meet the other requirements for leave trees.

General prescription for vegetation retention along streams - all cases on the west side:

SMALL TYPE D STREAM
CLEARCUT HARVEST

RMA width = 20 feet

Do the following each side of stream:

- Retain all understory vegetation within 10 feet of the high water level.
- Retain all trees within 20 feet of the high water level.
- Retain all snags and downed wood in the channel and RMA.

All conifers and hardwoods retained in the RMA may be counted towards requirements for leave trees within clearcuts, as long as they meet the other requirements for leave trees.

General prescription for vegetation retention along streams -- all cases on the west side:

SMALL TYPE N STREAM CLEARCUT HARVEST

No RMA width designated

Do the following each side of stream:

- Retain understory vegetation and unmerchantable conifers (conifers less than 6 inches DBH) 10 feet each side of the high water mark for the perennial channels indicated below:

GEOGRAPHIC REGION	WHERE REQUIRED
Coast Range	none required
South Coast	perennial channels where the upstream drainage area is greater than 160 acres
Interior	perennial channels where the upstream drainage area is greater than 330 acres
Western Cascades	none required
Siskiyou	perennial channels where the upstream drainage area is greater than 580 acres

A stream is considered to be perennial if it normally has summer surface flow after July 15. When determining whether a stream is perennial or not, the State Forester shall make the decision using information such as comparisons with similar nearby streams that are known to be perennial or landowner knowledge of the stream's flow during the summer.

For the purposes of minimizing stream warming and its detrimental effect on amphibians that may inhabit headwater streams, operators are encouraged to retain understory vegetation, non-merchantable trees, and in-unit trees required for clearcuts along all perennial small Type N streams in an operation.

General prescription for vegetation retention along streams with good conifer stocking -- Live conifer basal area in the RMA (square feet per 1000 feet) is greater than 45 for Coast Range, South Coast, and Siskiyou, and greater than 55 for Interior and Western Cascades geographic regions:

LARGE TYPE D OR TYPE N STREAM PARTIAL HARVEST OR THINNING

RMA width = 70 feet

Do the following each side of stream:

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

West Side Geographic Regions

Geographic Region	SQUARE FEET OF BASAL AREA PER 1000 FEET OF STREAM
	Standard Target
Coast Range & South Coast	140
Interior & West. Cascades	160
Siskiyou	120

- Retain all snags and downed wood in the channel and RMA.
- Retain no fewer than 30 live conifer trees (greater than 11 inches DBH) per 1000 feet within the RMA.
- Retain enough conifer basal area within the RMA to meet the **standard target.**

Note: All cottonwood and Oregon ash trees (6 inches or greater DBH) retained in the RMA but growing more than 20 feet from the high water mark may count toward the basal area target.

A combination of the following can make up to 10 percent of the basal area target:

- The basal area of hardwoods (other than alder, cottonwood, and Oregon ash) retained in the RMA that are greater than 24 inches DBH but growing more than 20 feet from the high water mark;

- The basal area of sound snags (6 inches or greater DBH and at least 30 feet high) that are anywhere within the RMA.

General prescription for vegetation retention along streams with good conifer stocking -- Live conifer basal area in the RMA (square feet per 1000 feet) is greater than 25:

MEDIUM TYPE D OR TYPE N STREAM PARTIAL HARVEST OR THINNING

RMA width = 50 feet

Do the following each side of stream:

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

West Side Geographic Regions

Geographic Region	SQUARE FEET OF BASAL AREA PER 1000 FEET OF STREAM
	Standard Target
Coast Range & South Coast	60
Interior & West. Cascades	60
Siskiyou	60

- Retain all snags and downed wood in the channel and RMA.
- Retain no fewer than 10 live conifer trees (greater than 8 inches DBH) per 1000 feet within the RMA.
- Retain enough conifer and hardwood basal area within the RMA to meet the **standard target.**

Note: Hardwood trees retained in the RMA can contribute up to a maximum of 30 square feet of basal area per 1000 feet towards meeting the standard target.

Sound conifer snags (6 inches or greater DBH and at least 30 feet high) can make up as much as 5 percent of the standard target.

General prescription for vegetation retention along streams -- all cases on the west side:

SMALL TYPE D STREAM
PARTIAL HARVEST OR THINNING

RMA width = 20 feet

Do the following each side of stream:

- Retain all understory vegetation within 10 feet of the high water level.
- Retain all trees within 20 feet of the high water level.
- Retain all snags and downed wood in the channel and RMA.

General prescription for vegetation retention along streams -- all cases on the west side:

SMALL TYPE N STREAM
PARTIAL HARVEST OR THINNING

No RMA width designated

Do the following each side of stream:

- Retain understory vegetation and unmerchantable conifers (conifers less than 6 inches DBH) 10 feet each side of the high water mark for the perennial channels indicated below:

GEOGRAPHIC REGION	WHERE REQUIRED
Coast Range	none required
South Coast	perennial channels where the upstream drainage area is greater than 160 acres
Interior	perennial channels where the upstream drainage area is greater than 330 acres
Western Cascades	none required
Siskiyou	perennial channels where the upstream drainage area is greater than 580 acres

A stream is considered to be perennial if it normally has summer surface flow after July 15. When determining whether a stream is perennial or not, the State Forester shall make the decision using information such as comparisons with similar nearby streams that are known to be perennial or landowner knowledge of the stream's flow during the summer.

For the purposes of minimizing stream warming and its detrimental effect on amphibians that may inhabit headwater streams, operators are encouraged to retain understory vegetation and non-merchantable trees along all perennial streams in an operation.

General prescription for vegetation retention along streams with good conifer stocking -- Live conifer basal area in the RMA (square feet per 1000 feet) is greater than 35:

LARGE TYPE D OR TYPE N STREAM CLEARCUT HARVEST

RMA width = 70 feet

Do the following each side of stream:

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

East Side Geographic Regions

Geographic Region	SQUARE FEET OF BASAL AREA PER 1000 FEET OF STREAM
	Standard Target
Eastern Cascades	70
Blue Mountains	70

- Retain all snags and downed wood in the channel and RMA.
- Retain no fewer than 30 live conifer trees (greater than 11 inches DBH) per 1000 feet within the RMA.
- Retain enough conifer basal area within the RMA to meet the **standard target.**

Note: All hardwoods (6 inches or greater DBH) retained in the RMA may count toward the basal area target.

Sound conifer snags (6 inches or greater DBH and at least 30 feet high) retained in the RMA may count toward as much as 10 percent of the basal area target:

All conifers and hardwoods retained in the RMA may be counted towards requirements for leave trees within clearcuts, as long as they meet the other requirements for leave trees.

General prescription for vegetation retention along streams with good conifer stocking -- Live basal area in the RMA (square feet per 1000 feet) is greater than 25:

MEDIUM TYPE D OR TYPE N STREAM CLEARCUT HARVEST

RMA width = 50 feet

Do the following each side of stream:

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

East Side Geographic Regions

Geographic Region	SQUARE FEET OF BASAL AREA PER 1000 FEET OF STREAM
	Standard Target
Eastern Cascades	50
Blue Mountains	50

- Retain all snags and downed wood in the channel and RMA.
- Retain no fewer than 10 live conifer trees (greater than 8 inches DBH) per 1000 feet within the RMA.
- Retain enough conifer and hardwood basal area within the RMA to meet the **standard target.**

Note: Hardwood trees retained in the RMA can contribute up to a maximum of 30 square feet of basal area per 1000 feet towards meeting the standard target.

Sound conifer snags (6 inches or greater DBH and at least 30 feet high) can make up as much as 5 percent of the standard target.

All conifers and hardwoods retained in the RMA may be counted towards requirements for leave trees within clearcuts, as long as they meet the other requirements for leave trees.

General prescription for vegetation retention along streams - - all cases on the east side:

SMALL TYPE D STREAM
CLEARCUT HARVEST

RMA width = 20 feet

Do the following each side of stream:

- Retain all understory vegetation within 10 feet of the high water level.
- Retain all trees within 20 feet of the high water level.
- Retain all snags and downed wood in the channel and RMA.

All conifers and hardwoods retained in the RMA may be counted towards requirements for leave trees within clearcuts, as long as they meet the other requirements for leave trees.

General prescription for vegetation retention along streams -- all cases on the east side:

SMALL TYPE N STREAM CLEARCUT HARVEST

No RMA width designated

Do the following each side of stream:

- Retain understory vegetation and unmerchantable conifers (conifers less than 6 inches DBH) 10 feet each side of the high water mark for the perennial channels indicated below:

GEOGRAPHIC REGION	WHERE REQUIRED
Eastern Cascades	along all perennial channels
Blue Mountains	along all perennial channels

A stream is considered to be perennial if it normally has summer surface flow after July 15. When determining whether a stream is perennial or not, the State Forester shall make the decision using information such as comparisons with similar nearby streams that are known to be perennial or landowner knowledge of the stream's flow during the summer.

For the purposes of minimizing stream warming and its detrimental effect on amphibians that may inhabit headwater streams, operators are encouraged to also retain in-unit trees required for clearcuts along all small Type N perennial streams in an operation.

General prescription for vegetation retention along streams with good conifer stocking -- Live conifer basal area in the RMA (square feet per 1000 feet) is greater than 35:

LARGE TYPE D OR TYPE N STREAM PARTIAL HARVEST OR THINNING

RMA width = 70 feet

Do the following each side of stream:

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

East Side Geographic Regions

Geographic Region	SQUARE FEET OF BASAL AREA PER 1000 FEET OF STREAM
	Standard Target
Eastern Cascades	100
Blue Mountains	100

- Retain all snags and downed wood in the channel and RMA.
- Retain no fewer than 30 live conifer trees (greater than 11 inches DBH) per 1000 feet within the RMA.
- Retain enough conifer basal area within the RMA to meet the **standard target.**

Note: All hardwoods (6 inches or greater DBH) retained in the RMA may count toward the basal area target.

Sound conifer snags (6 inches or greater DBH and at least 30 feet high) retained in the RMA may count toward as much as 10 percent of the basal area target.

General prescription for vegetation retention along streams with good conifer stocking -- Live conifer basal area in the RMA (square feet per 1000 feet) is greater than 25:

MEDIUM TYPE D OR TYPE N STREAM PARTIAL HARVEST OR THINNING

RMA width = 50 feet

Do the following each side of stream:

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

East Side Geographic Regions

Geographic Region	SQUARE FEET OF BASAL AREA PER 1000 FEET OF STREAM
	Standard Target
Eastern Cascades	60
Blue Mountains	60

- Retain all snags and downed wood in the channel and RMA.
- Retain no fewer than 10 live conifer trees (greater than 8 inches DBH) per 1000 feet within the RMA.
- Retain enough conifer and hardwood basal area within the RMA to meet the **standard target.**

Note: Hardwood trees retained in the RMA can contribute up to a maximum of 30 square feet of basal area per 1000 feet towards meeting the standard target.

Sound conifer snags (6 inches or greater DBH and at least 30 feet high) can make up as much as 5 percent of the standard target.

General prescription for vegetation retention along streams - - all cases on the east side:

SMALL TYPE D STREAM
PARTIAL HARVEST OR THINNING

RMA width = 20 feet

Do the following each side of stream:

- Retain all understory vegetation within 10 feet of the high water level.
- Retain all trees within 20 feet of the high water level.
- Retain all snags and downed wood in the channel and RMA.

General prescription for vegetation retention along streams -- all cases on the east side:

SMALL TYPE N STREAM
PARTIAL HARVEST OR THINNING

No RMA width designated

Do the following each side of stream:

- Retain understory vegetation and unmerchantable conifers (conifers less than 6 inches DBH) 10 feet each side of the high water mark for the perennial channels indicated below:

GEOGRAPHIC REGION	WHERE REQUIRED
Eastern Cascades	along all perennial channels
Blue Mountains	along all perennial channels

A stream is considered to be perennial if it normally has summer surface flow after July 15. When determining whether a stream is perennial or not, the State Forester shall make the decision using information such as comparisons with similar nearby streams that are known to be perennial or landowner knowledge of the stream's flow during the summer.