

CLASS I STREAMSIDE TREE RETENTION RULES



State Forester Forum

Retaining trees near fish-bearing streams is an important component of the Idaho Forest Practices Act. This State Forester Forum explains the Idaho Forest Practices Act streamside tree retention requirements (Shade Rule) and describes a process for landowners and operators to determine streamside management options within harvest units.



The Shade Rule applies to all forest landowners in Idaho, large or small, including all private, state and federal landowners, that have Class I streams on their property.

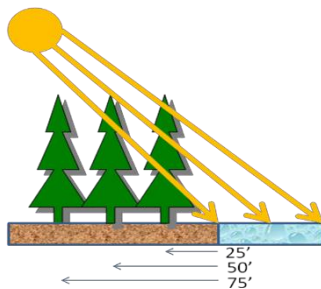
The Idaho Forest Practices Act Advisory Committee (FPAAC), a nine member citizen technical committee, developed the Shade Rule and the methods for selecting trees to leave along Class I streams.

The rule intent is to allow active management along Class I streams while maintaining essential riparian functions.

As defined in [Idaho Forest Practices Rules](#), Class I streams are important for spawning, rearing or migration of fish or are used as a domestic water supply. Class I Stream Protection Zones (SPZ) encompass an area of 75 feet (slope distance) on each side of the stream's ordinary high water mark. For more information on defining stream protection zones, review IDL's [Stream Protection Zone](#).

The Benefits of Shade

Shade over streams benefits fish habitat in a myriad of ways. It keeps water cool for successful spawning, and, creates structures when trees fall into the stream channel forming pools that enhance the ability of fish to feed, spawn, rest, and migrate upstream.



Trees next to the stream typically provide the majority of the shade cast by a riparian buffer.

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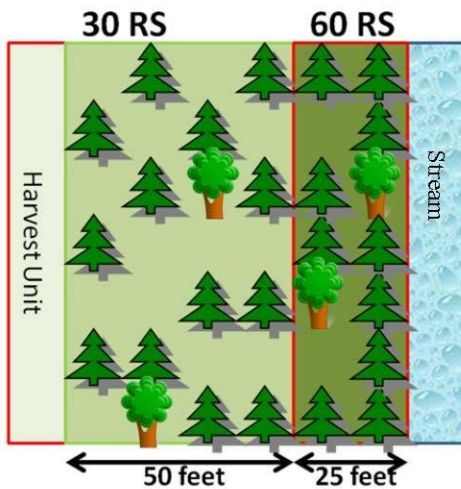
The Shade Rule requires a 75 foot wide buffer on each side of Class I streams and provides landowners with two management options for retaining trees in this area. Only one (1) option can be implemented within the stream protection zone of a harvest unit covered by a single notification.

The Rule

30.7.e.ii. *Adjacent to all Class I streams, to maintain and enhance shade and large woody debris recruitment, landowners must comply with one of the two following options defining tree retention. The Relative Stocking per acre (RS) referenced in the options is calculated according to the relative-stocking distribution table. (Table 1).*

Option 1

Option 1 requires more trees to be left in the inner 25-ft. next to the stream and fewer trees in the outer 50-ft. of stream protection zone.

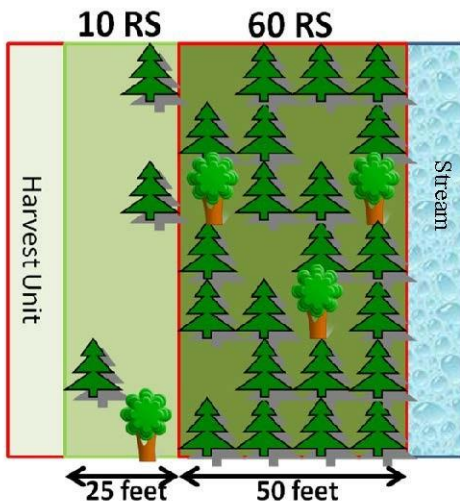


Within twenty-five (25) feet from the ordinary high water mark on each side of the stream, live conifers and hardwoods will be retained to maintain a minimum relative stocking per acre of sixty (60).

A relative stocking per acre of thirty (30) must be retained in the stream protection zone between twenty-five (25) feet and seventy-five (75) feet from the ordinary high water mark on both sides of the stream.

Option 2

Option 2 requires more trees to be left in the inner 50-ft. next to the stream and fewer trees in the outer 25-ft. of the stream protection zone.



Within fifty (50) feet from the ordinary high water mark on each side of a stream, live conifers and hardwoods will be retained to maintain a minimum relative stocking per acre of sixty (60).

A relative stocking per acre of ten (10) must be retained in the stream protection zone between fifty (50) feet and seventy-five (75) feet from the ordinary high water mark on both sides of the stream.

How to Implement the Rule

To determine what trees can be harvested along a Class I stream, follow the six-step process outlined below. The process includes determining forest type, management options, locating stream protection zones, and inventorying trees within the SPZ to provide the current relative stocking. Once the current stocking level is known and, if the current stocking exceeds the required minimum to protect the stream, trees can be selected for harvest.

If no harvest occurs in the SPZ, an inventory is not needed.

Tools used for determining shade retention along a Class I stream are found at: [SPZ Harvest Information](#).

Step 1. Determine forest type

There are five distinct forest types in Idaho that are defined in the FPA rules. The forest type found within the SPZ will determine the site's potential relative stocking. For assistance, contact your local Private Forestry Specialist: [IDL Supervisory Areas](#).

Idaho Forest Types

Determine which of the following forest types applies to the harvest area.

- ⇒ **A. North Idaho grand fir/western red cedar (NIGF):** moist to wet interior forests with western red cedar, western hemlock, and grand fir being primary climax species, found in forests north of the Clearwater/ and Lochsa Rivers.
- ⇒ **B. Central Idaho grand fir/western red cedar (CIGF):** productive conifer forests found in forests between the Lochsa River Basin and the Salmon River, characterized by stands having western red cedar and grand fir as climax species, with a mixed conifer overstory increasingly comprised of ponderosa pine, Douglas-fir, and larch in the river breaks canyon lands. Stocking levels are generally lower than that of the NIGF stands.
- ⇒ **C. South Idaho grand fir (SIGF):** mixed-conifer forests, dominated by ponderosa pine and Douglas-fir, found south of the Salmon River with grand fir and occasionally western red cedar being the stand climax species.
- ⇒ **D. Western hemlock-subalpine fir (WH):** higher-elevation, moist, cool interior forests dominated by western hemlock, mountain hemlock, and/or subalpine fir.
- ⇒ **E. Douglas-fir-ponderosa pine (PP):** drier forests dominated by ponderosa pine and Douglas-fir, generally found in lower-elevation, dry sites.

Step 2. Decide which management option best suits your goals.

The rule provides two options and the option a landowner selects is determined by landowner objectives and existing riparian conditions. A pre-harvest inventory (step 4) will help inform which option is best.

The inventory can also help meet specific landowner goals. For example, if the objective is to remove trees that pose a forest health risk, selecting one option over the other may provide a greater opportunity to harvest these trees.

In certain cases, a site-specific riparian management plan may be needed.

Site Specific Riparian Management Plans

Certain streamside silvicultural and forest-health conditions may alter how the intent of this rule is best met. In this situation, managers may choose to develop and submit for approval a Site-Specific Riparian Management Plan. Site-specific plans will be allowed if they meet or exceed, over the long term, the intent of the streamside tree retention rule –to move the forest to appropriate stocking levels that provide improved shade and woody debris recruitment over streams.

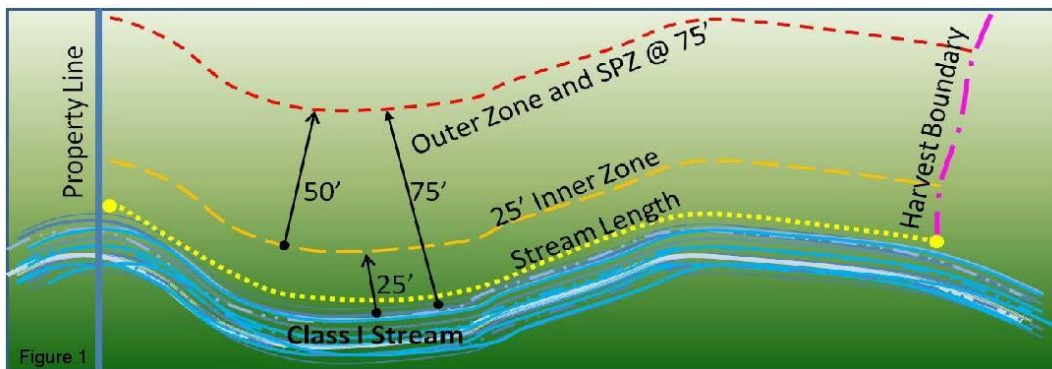
How to Implement the Rule

Step 3. Locate the stream protection zone boundaries

To determine relative stocking, begin by delineating the inner and outer boundaries of the stream protection zone on each side of the stream. For option 1 delineate a 25' inner and 50' outer zone (Figure 1). For option 2, delineate a 50' inner and 25' outer zone. Both options will provide a 75' SPZ.

Tip

⇒ When it is not clear what option is best, divide the SPZ into three 25' zones. The inner zone (0—25' from the stream) will always require a minimum relative stocking of 60 percent. This method provides the landowner with calculations for either option allowing the landowner to make the optimal decision.



Step 4. Conduct the pre-harvest SPZ tree inventory

Tips

- ⇒ Use IDL's Tree Retention Zone Inventory Form or worksheets to record data and determine relative stocking. The form and worksheets are available on IDL's website: [SPZ Harvest Information](#).
- ⇒ DBH = diameter at breast height, a measure taken 4-1/2 feet above the ground on the uphill side of the tree. To find DBH, wrap a standard measuring tape around the trunk of the tree. Divide the measurement by 3.14 to get the diameter.

Select Inventory Option

Option 1

1. From the ordinary high water mark, determine the 25' inner and 75' outer zones. This creates a 25' wide inner zone and a 50' wide outer zone. Flagging the boundary lines will help when counting trees.
2. Measure the stream length and calculate the acres for each zone. Acres = length x width (square feet) / 43,560.
3. Within each zone, **count all live trees** (including hardwoods) greater than four inches diameter at breast height (DBH). Record the trees by diameter class (Table 1) within each zone.

Option 2

1. From the ordinary high water mark, determine the 50' inner and 25' outer zones. This creates a 50' wide inner zone and a 25' wide outer zone. Flagging these boundary lines will help when counting trees.

The "two options approach" is unique in the West and demonstrates Idaho's leadership in developing solutions that balance landowner rights, provide flexibility, and protect Idaho's forest and water resources.

How to Implement the Rule

Step 5. Calculate existing relative stocking

Relative stocking is a measure of site occupancy calculated as a ratio comparing existing stand density to the biological maximum density for a given forest type, and, it shows the extent to which trees utilize a plot of forestland. Relative stocking is expressed as a percentage and should be under 100. If it is greater than 100, verify the data and forest type. On highly productive sites, the relative stocking may be over 100.

To calculate relative stocking:

1. Enter tree measurements (from step 4) into the IDL spreadsheet. The spreadsheet will automatically calculate the relative stocking based on relative stocking by diameter class (Table 1).
2. **The inner zone for either option must be greater than 60**, or no harvest can occur in the inner zone. For Option 1, the outer zone must be greater than 30, and for Option 2, the outer zone must be greater than 10.

The table below represents the per tree contribution by forest type and diameter class to determine relative stocking.

Forest Type	Per Tree Contribution to Relative Stocking by Diameter Class						
	Diameter Class (DBH in inches)						
	4-7.9"	8-11.9"	12-15.9"	16-19.9"	20-23.9"	24-27.9"	28-31.9"
NIGF (North Idaho Grand Fir)	0.097	0.209	0.347	0.506	0.683	0.878	1.088
CIGF (Central Idaho Grand Fir)	0.113	0.244	0.405	0.59	0.797	1.024	1.27
SIGF (Southern Idaho Grand Fir)	0.136	0.293	0.486	0.708	0.957	1.229	1.524
WHSF (Western Hemlock-Subalpine Fir)	0.123	0.267	0.442	0.644	0.87	1.117	1.385
DFPP (Douglas-fir-Ponderosa Pine)	0.151	0.326	0.54	0.787	1.063	1.366	1.693

Table 1

Step 6. Conduct Harvest

If the relative stocking exceeds the required zone minimum, trees can be selected for harvest.

Landowners are encouraged to retain all trees immediately adjacent to the stream. Often, these trees can be difficult to remove. Keep in mind the physical limitations of removing them.

Space trees evenly within the SPZ to provide consistent shade and large woody debris recruitment.

Tip

- ⇒ Leave more than the minimum required relative stocking to account for trees damaged during harvest and to ensure minimum stocking will be met after harvest.

Consult the [Idaho Forest Practices Rules](#) for detailed requirements on forest practices in the SPZ.

References

Teply, M.; 2012, Using Stream Shade and Large Wood Recruitment Simulation Models to Inform Forest Practices Regulations in Idaho.

Optional Plot Sampling Method

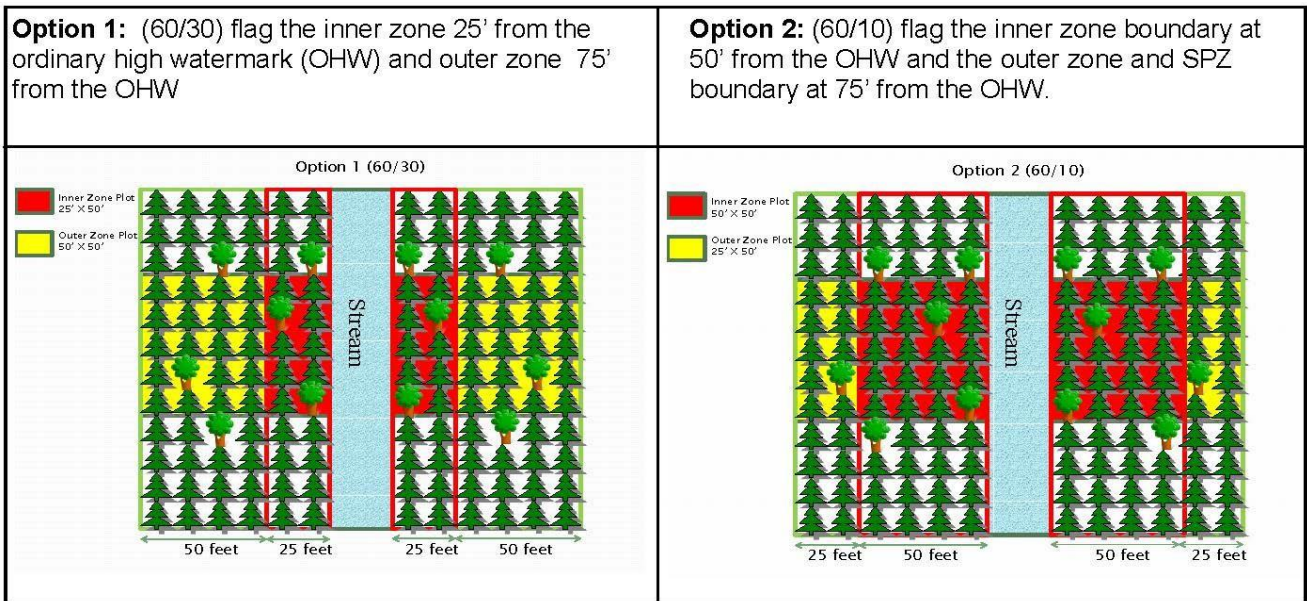
For stream segments over 1000', plot sampling is an acceptable method for determining relative stocking. A minimum 20 percent sample is recommended when using plots.

Step 1

Choose harvest option 1 (60/30) or option 2 (60/10). If unsure which option is best, divide the SPZ into three parallel 25' zones. Measure each zone separately and determine which option would best meet landowner objectives.

Step 2

Flag or designate the boundaries of the selected option.



Step 3

Start at the intersection of the stream and harvest boundary . To locate the first plot, measure a fixed distance (100' for example) from the boundary. This will minimize potential error introduced by the boundary.

Step 4

Establish the first plot. Create a rectangular plot which extends 75' from the stream and encompasses 50' of stream length. The plot will include the inner zone and outer zones.

Step 5

Count each tree in the inner zone, measure and record them by the DBH class. Count each tree in the outer zone, measure and record them by DBH class.

Step 6

From the first plot, measure 200' stream distance and establish the next plot. The intention is to sample 20% of the SPZ.

Optional Plot Sampling Method

Step 7

Continue this process throughout the SPZ harvest unit. Inventory both sides of the stream. Some plots may have openings such as roads, trails or meadows. Include these areas if they fall within the plot.

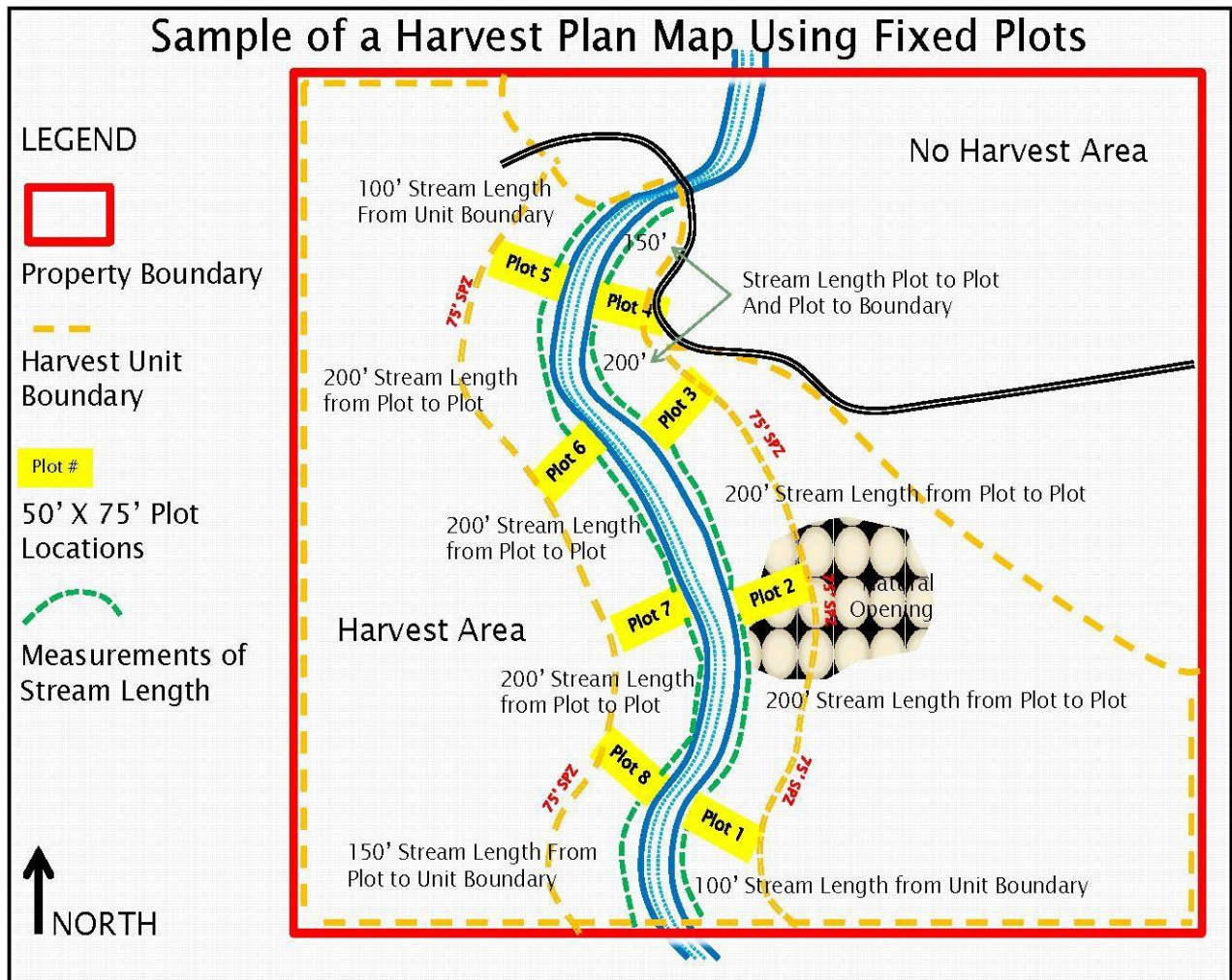
High stocking on one side of a stream does not justify harvesting the other side below rule requirements. Each side of the stream should be measured separately, unless they are comparable.

Step 8

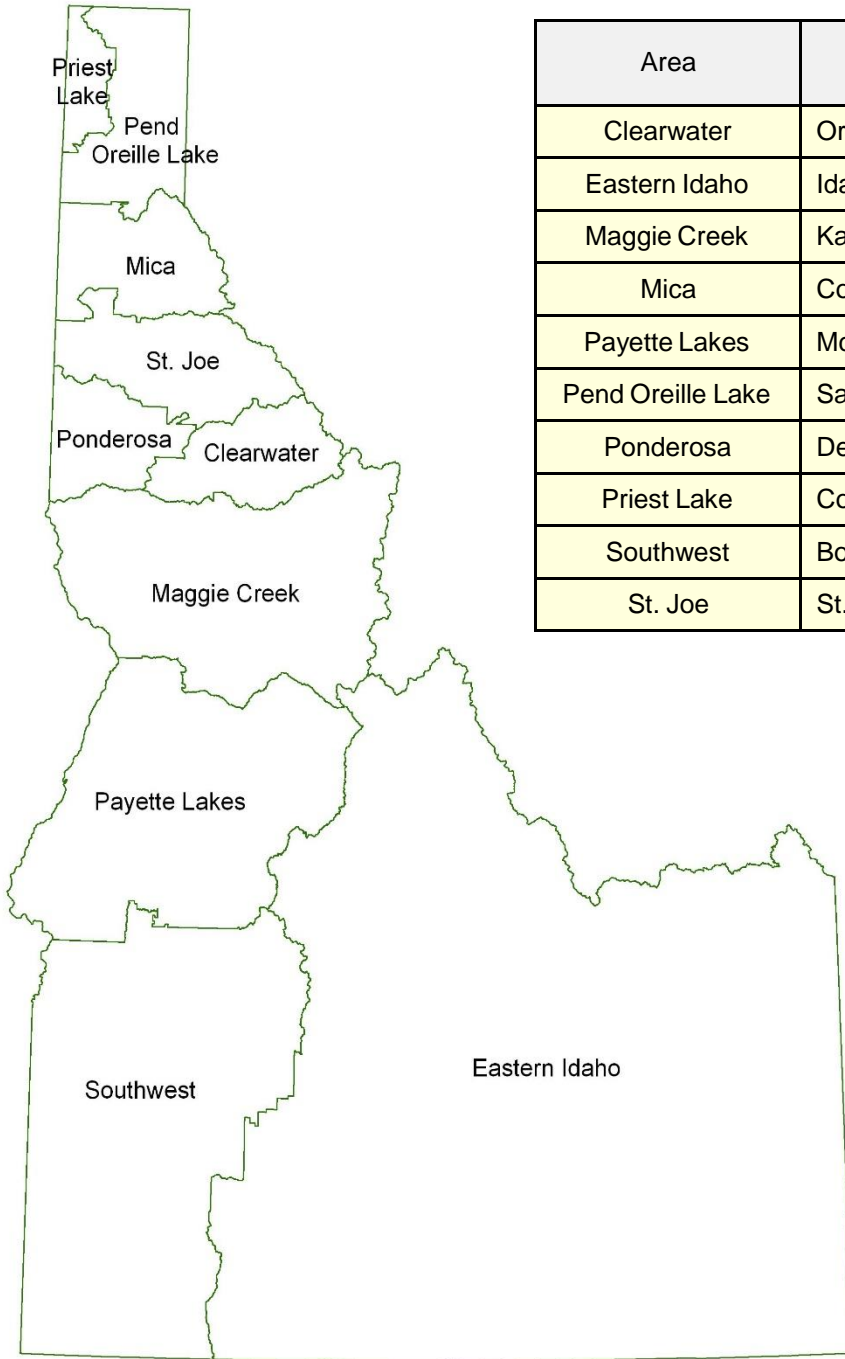
Determine acres to be harvested within the stream protection zone. Using IDL's spreadsheets, enter tree data and calculate the pre-harvest relative stocking. Using the fixed plot method, if the relative stocking is near minimum levels, harvest is not recommended. If the relative stocking is above the minimum required, harvesting in the SPZ can occur.

Step 9

Designate trees for removal. Evenly space the leave trees. To compensate for sampling error and to ensure minimum stocking will be met after harvest, leave a few more trees than the minimum number. Note: Often, trees close to the stream can be difficult to remove, keep in mind the physical limitations of removing them. Harvesting large clumps of trees will create openings and may not meet the rule.



**FOR MORE INFORMATION CONTACT
IDAHO DEPARTMENT OF LANDS
PRIVATE FORESTRY SPECIALISTS**



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Clearwater	Orofino	(208) 476-4587
Eastern Idaho	Idaho Falls	(208) 525-7167
Maggie Creek	Kamiah	(208) 935-2141
Mica	Coeur d'Alene	(208) 769-1577
Payette Lakes	McCall	(208) 634-7125
Pend Oreille Lake	Sandpoint	(208) 263-5104
Ponderosa	Deary	(208) 877-1121
Priest Lake	Coolin	(208) 443-2516
Southwest	Boise	(208) 334-3488
St. Joe	St. Maries	(208) 245-4551

