

Shade Rule Redesign Proposal

The most recent shade rule redesign proposal (December 2020) with weighted tree values is described below. The rule paragraph 030.07.e.ii would read as follows:

During commercial harvest within Class I stream protection zones, retain the following weighted tree count per one hundred (100) linear feet of stream:

- a. fifty-seven (57) north of the Clearwater/Lochsa Rivers
- b. forty-nine (49) between the Clearwater/Lochsa and Salmon Rivers
- c. forty-one (41) South of the Salmon River, and
- d. thirty-seven (37) in drier forests with Stream Protection Zones dominated by Douglas-fir and ponderosa pine.

At least four (4) of the above weighted tree count must be retained in the outer twenty-five feet (25') of the SPZ.

Calculate weighted tree count by multiplying the number of live conifers and hardwoods present in each diameter range by the weight below and then sum the results.

Diameter Range (DBH in inches)	4 – 11.9	12 – 19.9	20 – 27.9	28 – 35.9	≥36
Weight	1	3	5	8	11

Prior to and during harvest, cutting in any part of a given one hundred foot SPZ segment is only allowed if the weighted tree count in the inner fifty feet (50') of that segment is above: thirty-three (33) north of the Clearwater/Lochsa Rivers, twenty-eight (28) between the Clearwater/Lochsa and Salmon Rivers, twenty-three (23) South of the Salmon River, and twenty-one (21) in drier forests with Stream Protection Zones dominated by Douglas-fir and ponderosa pine. Note that the combination of minimum values for the inner fifty feet (50') and outer twenty-five feet (25') do not meet the minimum for the SPZ segment; additional trees need to be left in one or both areas to meet the rule.

A few things to note at first glance:

- There is no longer an Option 1 or Option 2, which helps to enhance understanding and simplify implementation.
- The Stream Protection Zone (SPZ) Inner and Outer Zones (which differed depending on Option selected) have been eliminated in favor of fixed distances from the Ordinary High Water Mark (OHWM).
- There are no longer Forest Type Definitions designated by a blend of species type and geographical location, but simply locations. This helps to simplify implementation.
- The weighted tree counts apply to segments of the SPZ of 100-foot length from the location on the stream where the SPZ harvest starts to where it ends.
- The required weighted tree retention is throughout the full Class I SPZ segment but requires that 4 of it be in the outer 25 feet of the SPZ and is consistent with a Relative Stocking (RS) of 10.

- Commercial cutting is not allowed in any given 100' segment that has a weighted tree count less than the minimums described in the text.
- It is IDL's intention to structure supporting paragraphs to allow for a variance to this restriction if a Forest Practice Advisor determines that the stream is well-shaded from hardwoods (< 4" DBH), brush, grass or topography.
- Finally, the minimum tree counts and weighting concept look like that which existed prior to the 2014 Shade Rule that implemented the Relative Stocking concept developed by Mark Teply (More on this is described below).

This proposed revision of the 2014 rule is derived from the same Relative Stocking science which was validated by the Idaho Department of Environmental Quality (DEQ) Shade Effectiveness Study (<https://www.idl.idaho.gov/wp-content/uploads/sites/116/2020/01/The-Effectiveness-of-Idahos-Class-I-Stream-Shade-Rule.pdf>) conducted by the University of Idaho and it incorporates everything we have learned since 2014.

The proposed formulation is based on the current Option 2 rule 60/60/10 Relative Stocking but allows for averaging throughout the SPZ. The average RS in this case is 43. The previous formulation (July 2020) was based on 60/30/30 which averaged to RS40. The objective in this formulation is to use the current rule science but find a simple way of dealing with situations where the stream adjacent stocking is low. The Operational Monitoring Study conducted by IDL showed that nearly all industrial forest land managers and about two-thirds of non-industrial forest landowners implemented the Option 2 60/10 rule. By eliminating the two-option structure, simplifying the requirement and providing more flexibility, incentive is provided to manage further into the SPZ which may lead to healthier and more resilient riparian areas.

Recall that the Shade Effectiveness Study showed the modeling to be conservative. The objective was no more than 10% shade removal, on average, but the on-the-ground study showed much less than 5% shade removal. However, in the few situations where either stream adjacent stocking was low or errors were made in applying the rule, shade reduction was greater than 10%. This proposal mitigates the impact of low stream adjacent stocking by limiting harvest in a segment which is stocked below a minimum value.

An intervening idea (between July and December) retained the Option 1 Zones (Inner 25 and Outer 50) but prevented harvest in a segment if the Inner Zone was below a weighted tree count of half the total requirement. There were problems with this concept identified by landowners in different parts of the state that tested it. Examples included SPZs with largely different characteristics near each other. The concept tested OK on SPZs with uniform stocking, but overly restricted harvest in outer areas of the SPZ when either the Inner Zone (25') was swampy, dense and well shaded with brush but had few conifers or where the tree density in the Outer Zone was well over RS100.

This most recent formulation provides more flexibility in meeting minimum shade requirements while ensuring shade protection is provided for closer to the stream. It also requires a minimum number of trees be left in the outer zone, which mimics the RS10 from the current Option 2 rule. Landowners that

choose to only manage the outer zone may still do so where they do not have bare spots in the inner zone. Landowners also have the flexibility to perform more selective cutting throughout the SPZ to achieve all their objectives; additionally, they can have their SPZ assessed by a Forest Practices Advisor, if they believe it is well shaded and the threshold weighted tree count requirement should be relaxed. In both cases the tree retention requirement is for the entire SPZ with two limiting factors to 1) avoid cutting where there is little shade adjacent to the stream and 2) to avoid removing all the trees from the outer area. The intent of this proposal is to protect portions of the SPZ that may be lacking shade close to the stream by favoring retention in the inner 50 feet and to simplify applying the rule. A more uniform harvest along the stream reach is a natural consequence of the stream segmentation and weighted tree count implementation.

Comparison of December 2020 Shade Rule Redesign Proposal to Pre-2014 Class I Tree Retention Table

Prior to the 2014 introduction of the Relative Stocking concept there was a standing tree table for the inner 50 feet of the SPZ dependent on stream width (See tree table below).

Additionally, no more than 25% of existing shade could be removed from the entire SPZ. We compare this new formulation to the previous shade and tree retention requirement for purely academic reasons, since it was shown from numerous quadrennial water quality audits to be inadequate for protecting aquatic life beneficial use. These comparative results show that the previous table was too lenient, certainly for shade and likely for LOD recruitment. Also, it did not allow for regional differences in forest productivity and treated all trees greater than 20" DBH the same.

vi. **Standing trees, including conifers, hardwoods and snags will be left within fifty (50) feet of the ordinary high water mark on each side of all Class I streams, and within thirty (30) feet on each side of all Class II streams, in the following minimum numbers per one thousand (1000) feet of stream:**

Minimum Standing Trees per One Thousand (1000) Feet Required (each side)

Tree Diameter (DBH)	Stream Width			Class II*
	Class I			
	Over 20'	10' - 20'	Under 10'	
3 - 7.9"	200	200	200	140
8 - 11.9"	42	42	42	---
12-19.9"	21	21	---	---
20"+	4	---	---	---

***For those Class II streams that require a minimum five (5) foot stream protection zone, no standing trees are required. (4-12-06)**

Combining the previous rule tree requirements by size and stream width with the proposed tree weights for each 100 feet of stream reveals the following:

Under 10' Stream Width Weighted Tree Count Every 100 Feet is 24

Diameter Class (inches)	4 – 11.9	12 – 19.9	20 – 27.9	28-35.9	>36
Weight	1	3	5	8	11
Trees per 100'	24.2				
Weighted value	24.2				

From 10' to 20' Stream Width Weighted Tree Count Every 100 Feet is 30

Diameter Class (inches)	4 – 11.9	12 – 19.9	20 – 27.9	28-35.9	>36
Weight	1	3	5	8	11
Trees per 100'	24	2.1			
Weighted value	24	6			

Over 20' Stream Width Weighted Tree Count Every 100 Feet is 32

Diameter Class (inches)	4 – 11.9	12 – 19.9	20 – 27.9	28-35.9	>36
Weight	1	3	5	8	11
Trees per 100'	24	2.1	0.4		
Weighted value	24	6	2		

Regardless of stream width, the proposed weighted tree count methodology is more protective throughout the entire SPZ than the pre-2014 stocking requirements. It also offers more flexibility than the rule currently in code, while setting an appropriate minimum threshold by location for each inner zone 100' stream segment. By limiting harvest in sparse segments, more uniform retention of shade throughout the length of SPZ management area is ensured as well as limiting harvest in situations where there is little to no shade along an entire stream reach due to long meadows or roads.

The way the methodology is crafted provides the maximum amount of flexibility to landowners while ensuring protective levels of shade remain. There are situations where streams' streamside vegetation is mainly small hardwoods and brush, but few if any conifers can propagate. Where the stream is heavily shaded and the outer SPZ is otherwise relatively dense, landowners may be able to obtain a variance from the restriction to harvesting in the outer portions of the SPZ, after an assessment by a Forest Practices Advisor. This variance is intended to document that existing shade next to the stream is adequate and no further mitigation would be required. As always, to deal with mortality problems, a landowner can always submit a Site Specific Riparian Management Plan which details steps that will be taken (e.g. high density reforestation, etc.) to ensure as good or better protection over the long term.