

FPA Update and the New Streamside Tree Retention Rules

North Fork Coeur d' Alene River Watershed
Advisory Group

USFS Office
Smelterville, Idaho
May 22, 2014



Archie Gray CF
Forest Practices Program Manager
Idaho Department of Lands

This report summarizes data collected from FPA inspections conducted by the Idaho Department of Lands on private lands in Idaho during calendar year 2013.

A copy of this report may be obtained from idl.idaho.gov



2013

Idaho Forest Practices Year-End Report



Developed and Submitted by

Archie Gray

Forest Practices Program Manager
Bureau of Forestry Assistance



Fire District	<i>2013 Private</i>	<i>2013 State</i>	<i>2013 Total</i>
Priest Lake	30	13	43
Kootenai Valley	244	0	244
Mica	261	6	267
Pend Oreille	512	9	521
Cataldo	105	1	106
St. Joe	339	17	356
Ponderosa	112	8	120
Maggie Creek	46	4	50
Craig Mountain	47	3	50
Southwest	56	5	61
Eastern Idaho	5	0	5
SITPA	72	8	80
CPTPA	<u>191</u>	<u>66</u>	<u>257</u>
TOTAL	2020	140	2160

Total Forest Practices Notifications (Compliances) Submitted in 2013

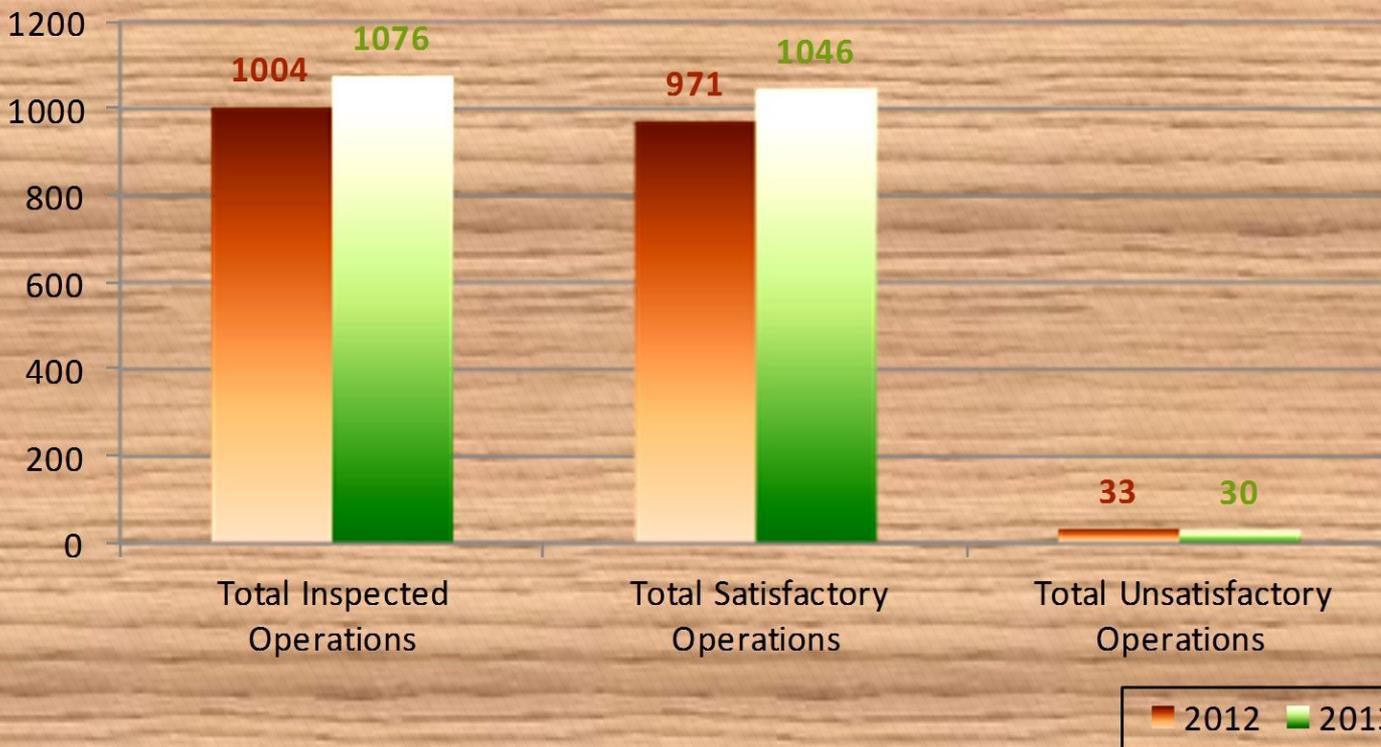


Fire District	2007	2008	2009	2010	2011	2012	2013
Priest Lake	109	75	39	49	42	40	43
Kootenai Valley	336	295	111	152	149	168	244
Mica	598	377	195	262	260	216	267
Pend Oreille	884	578	295	408	380	438	521
Cataldo	189	89	60	70	65	81	106
St. Joe	493	321	210	263	340	333	356
Ponderosa	255	157	71	120	121	99	120
Maggie Creek	106	62	27	59	47	41	50
Craig Mountain	120	61	49	72	59	74	50
Southwest	51	21	25	30	30	45	61
Eastern Idaho	16	9	3	7	6	4	5
SITPA	102	46	35	65	63	94	80
CPTPA	<u>259</u>	<u>175</u>	<u>162</u>	<u>233</u>	<u>259</u>	<u>226</u>	257
TOTAL	3518	2266	1282	1790	1821	1859	2160

Total Forest Practices Notifications/Hazard Management Agreements (Compliances) Submitted Each Year, 2007-2013, including operations conducted on both state and private forestlands.



2012 and 2013 Inspected Operations



Percent of Operations in Compliance

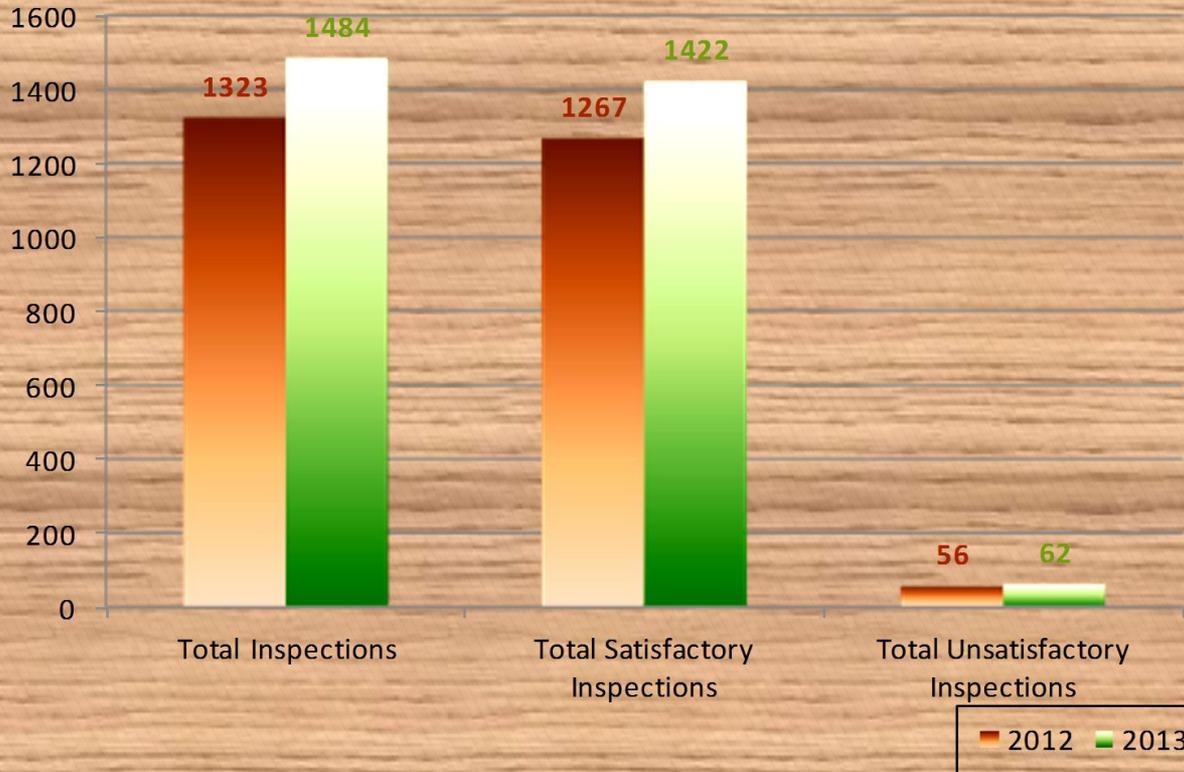
2012 = 96.7 %

2013 = 97.2 %

2013 Idaho Forest Practices *Year-End* Report



2012 and 2013 Inspection Reports Rule Compliance



Percentage of Inspection Reports in Compliance

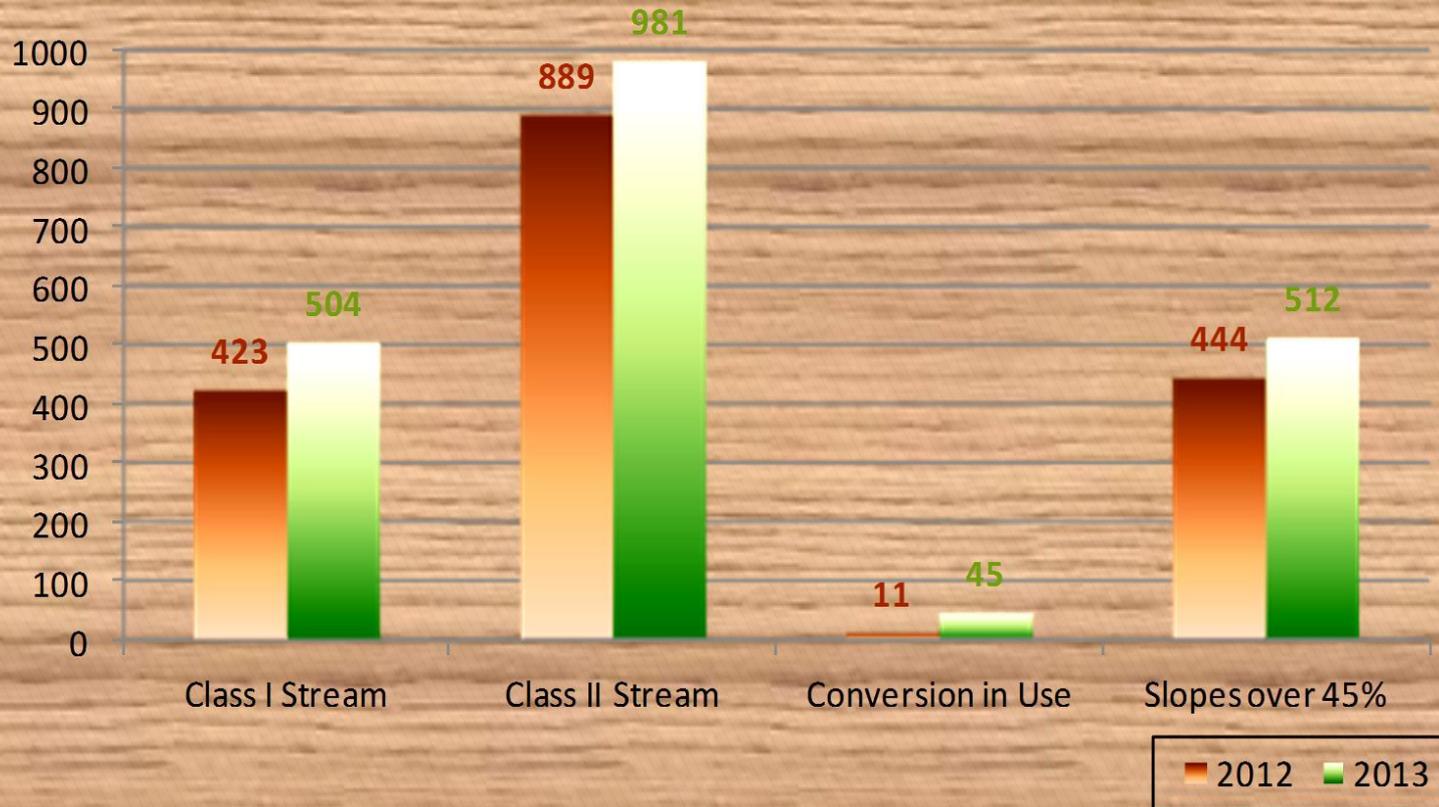
2012 = 95.8 %

2013 = 95.8 %

2013 Idaho Forest Practices *Year-End* Report



2012 and 2013 Inspection Report Attributes



2013 Idaho Forest Practices *Year-End* Report



030.07 Stream Protection

48 out of 62 (77.4%)

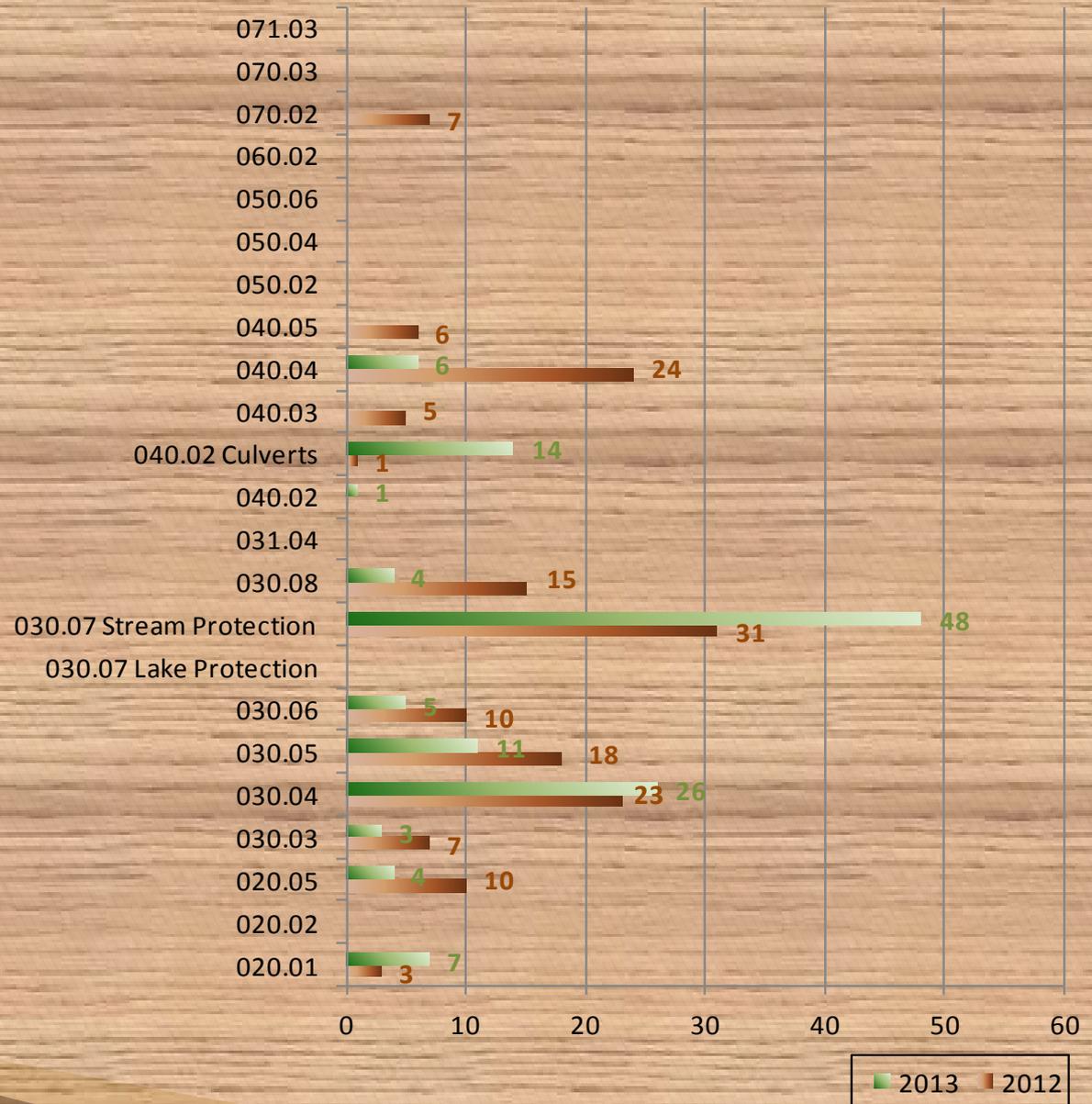
Unsatisfactory Reports included elements of Stream Protection. This needs to improve!

Numerical Performance Standards

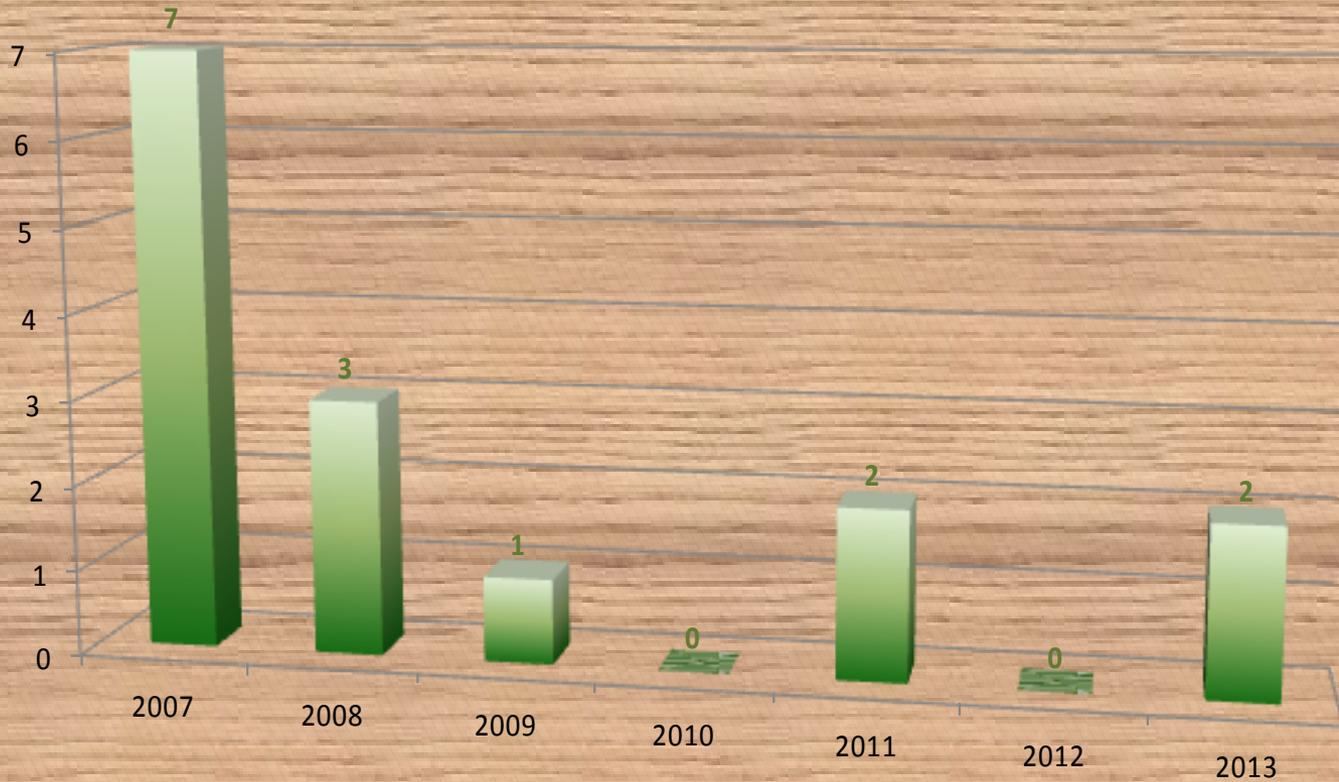
2013 Idaho Forest Practices Year-End Report



2012-2013 Individual Rules Violated in Unsatisfactory Reports



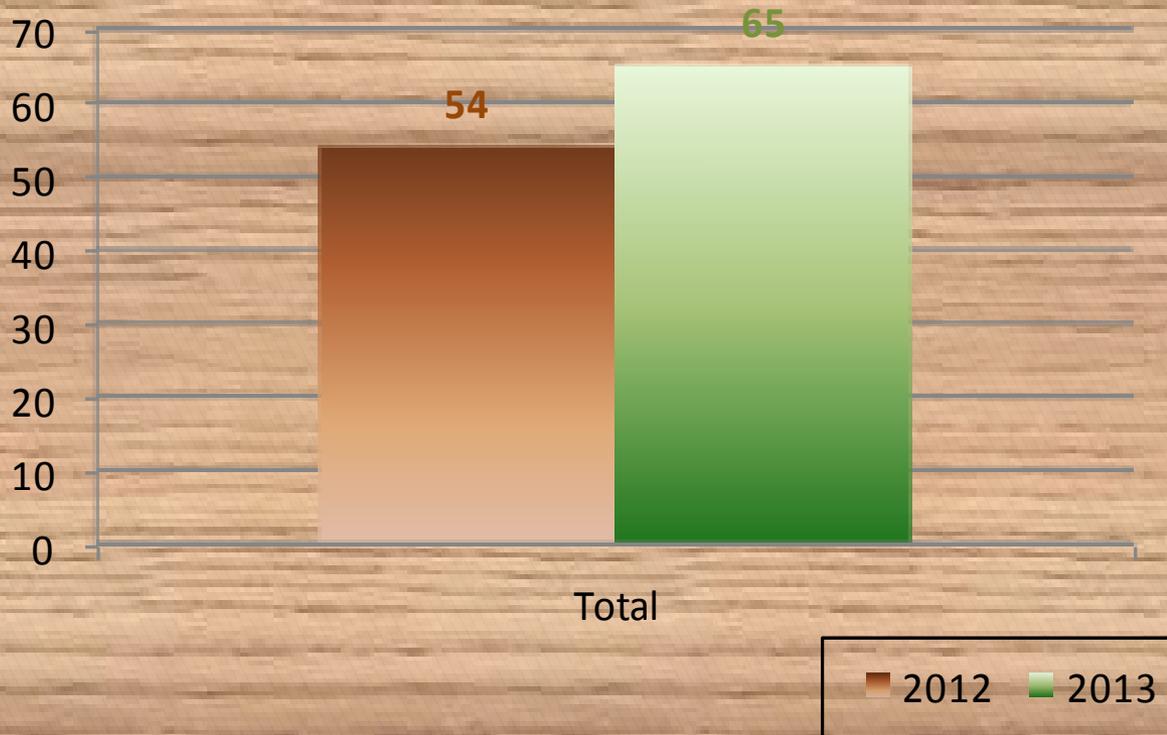
Comparison of Notices of Violation (NOVs) Issued 2007-2013



2013 Idaho Forest Practices *Year-End* Report



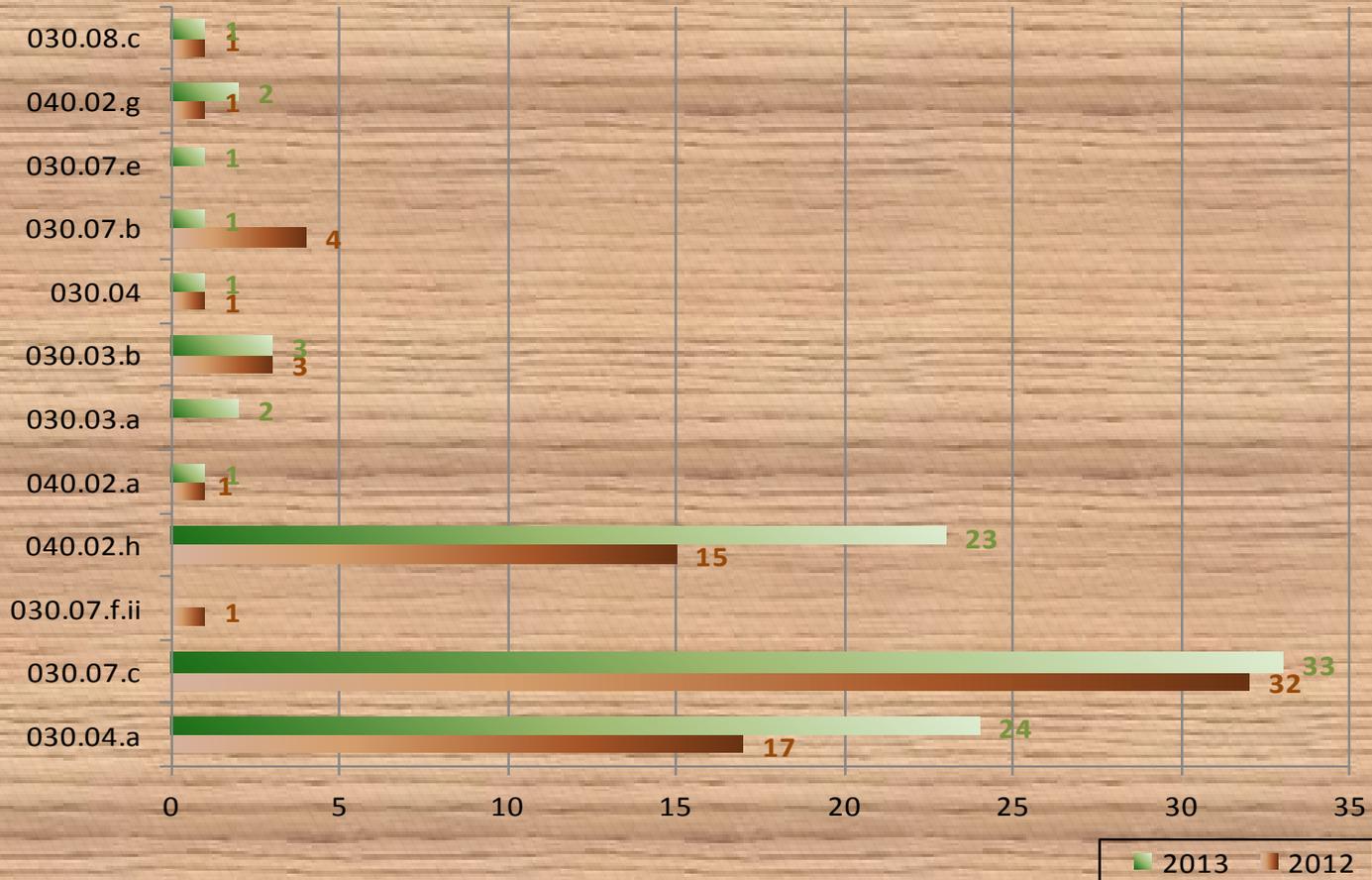
Variations Granted 2012-2013



2013 Idaho Forest Practices *Year-End* Report



2012-2013 Forest Practices Variances Granted Rules Varied



Why do we have a new Shade Rule In Idaho?

▶ **Background**

- **IDEQ recommendations following 2000 and 2004 water-quality audits**
 - ❖ *Minimum shade standards need to be better quantified*
 - ❖ *There is no clear scientific basis or explanation for the relationship between the tree retention requirements and production of LWD or shade; do additional applied research in an Idaho setting*
 - ❖ *As currently written, the shade rule allows repeated, “rapid fire” re-entry.*



Why Shade?

- ▶ Increased water temperatures can affect or influence salmonid physiology, behavior, and distribution and can interact with other stressors affecting salmonids (EPA 2001)
- ▶ Solar radiation may increase stream temperatures and increased stream temperatures may be considered a pollutant in many streams





So... Is this an ideal stream? >>



Attributes of the New Shade Rule

- ▶ Applies only to Class I streams
- ▶ 75' SPZ does not change
- ▶ Uses the concept of Relative Stocking to provide predictions of shade and minimum levels at which harvest may occur
- ▶ Creates Inner and Outer Zones within the SPZ to afford greater protection where it is most needed and effective and allow management where its impacts are reduced
- ▶ Provides two management options for landowners to choose from



Class I Streams

- ▶ “Class I streams are used for domestic water supply or are important for the spawning, rearing or migration of fish.”
- ▶ The new shade rule applies only to Class I Stream Protection Zones.
- ▶ Class I Stream Protection Zone means the area encompassed by a slope distance of seventy-five (75) feet on each side of the ordinary high water marks.



The 'Shade Rule'

▶ OLD SHADE RULE

- 030.07.e.ii. Leave seventy-five percent (75%) of the current shade over class I streams. Limit re-entry until shade recovers.

- **NOTE:** The 75' SPZ does not change.

▶ NEW SHADE RULE

- 030.07.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-contribution table below.



FOREST PRACTICES PENDING RULE

Streamside Tree Retention (Shade) Rule for Class I Streams

- ▶ **Relative Stocking:** A measure of site occupancy calculated as a ratio comparison of actual stand density to the biological maximum density for a given forest type. This ratio, expressed as a percentage, shows the extent to which trees utilize a plot of forestland.
 - **Relative Stocking is a *site specific measurement based on Forest Type.***
 - **Think of it as “Carrying Capacity”.**



Forest Type: Definitions

- ▶ North Idaho grand fir/western redcedar (NIGF): moist to wet interior forests with western redcedar, western hemlock, and grand fir being primary climax species, found in forests north of the Clearwater and Lochsa Rivers.
- ▶ Central Idaho grand fir/western redcedar (CIGF): productive conifer forests found in forests between the Lochsa River Basin and the Salmon River, characterized by stands having western redcedar 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.



Forest Type : Definitions

- ▶ 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 redcedar being the stand climax species.
- ▶ Western hemlock-subalpine fir (WH): higher-elevation, moist, cool interior forests dominated by western hemlock, mountain hemlock, and/or subalpine fir.
- ▶ Douglas-fir-ponderosa pine (PP): drier forests dominated by ponderosa pine and Douglas-fir, generally found in lower-elevation, dry sites.



Relative Stocking Tables

1031 TPA

288 TPA

146 TPA

forest type	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

662 TPA

185 TPA

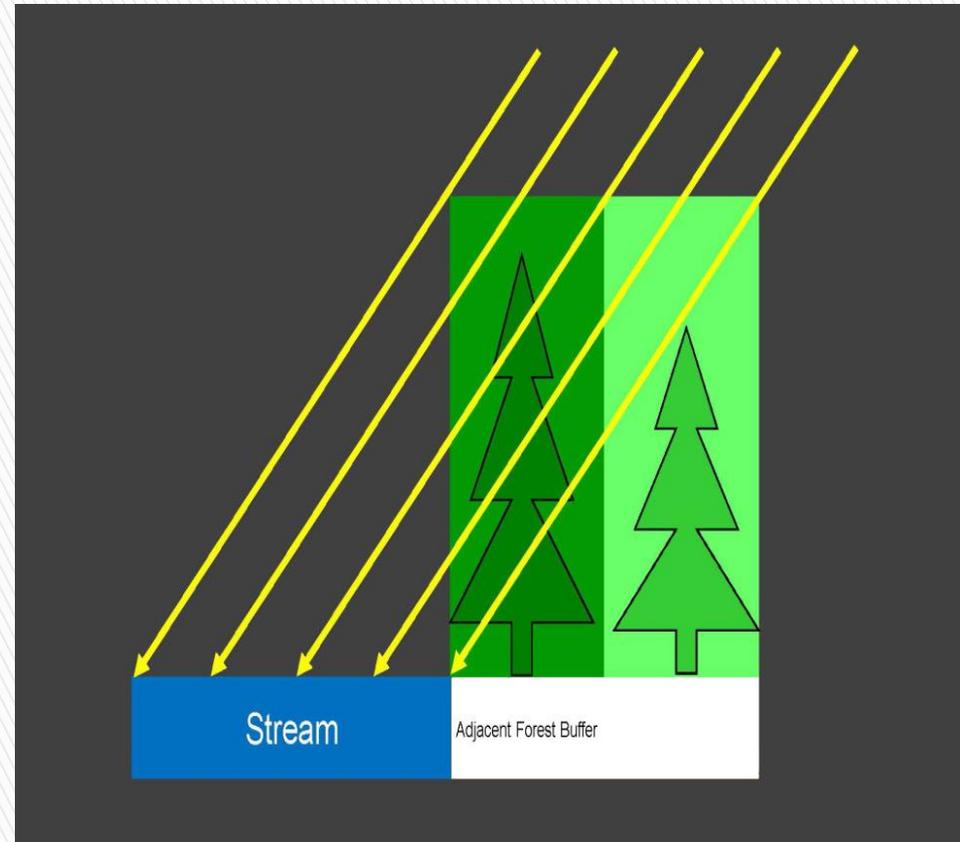
94 TPA

Relative stocking is specific to site productivity.



Why Two Zones (Inner and Outer)

- ▶ **More bang for your buck** - the closer the tree is to the stream
 - Shade
 - Large Woody Debris recruitment
- ▶ Rule is likely Conservative in that it does not account for all elements contributing to shade



The Two Options Approach

- ▶ FPAAC and IDL elected to go with a two options approach because there was a desire to provide management flexibility to landowners
- ▶ This two option approach is unique in the West
- ▶ Another sign of Idaho's commitment to finding creative solutions to management issues



Options

- ▶ Option 1: 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: 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.



Rule Continued

- ▶ Only one option may be implemented ~~within any 1000-ft. length of Stream Protection Zone on each side of a stream~~ within the stream protection zones of a harvesting unit covered by a single notification. Landowners are strongly encouraged to retain all trees immediately adjacent to the stream.



Streamside Tree Retention (Shade) Rule for Class I Streams

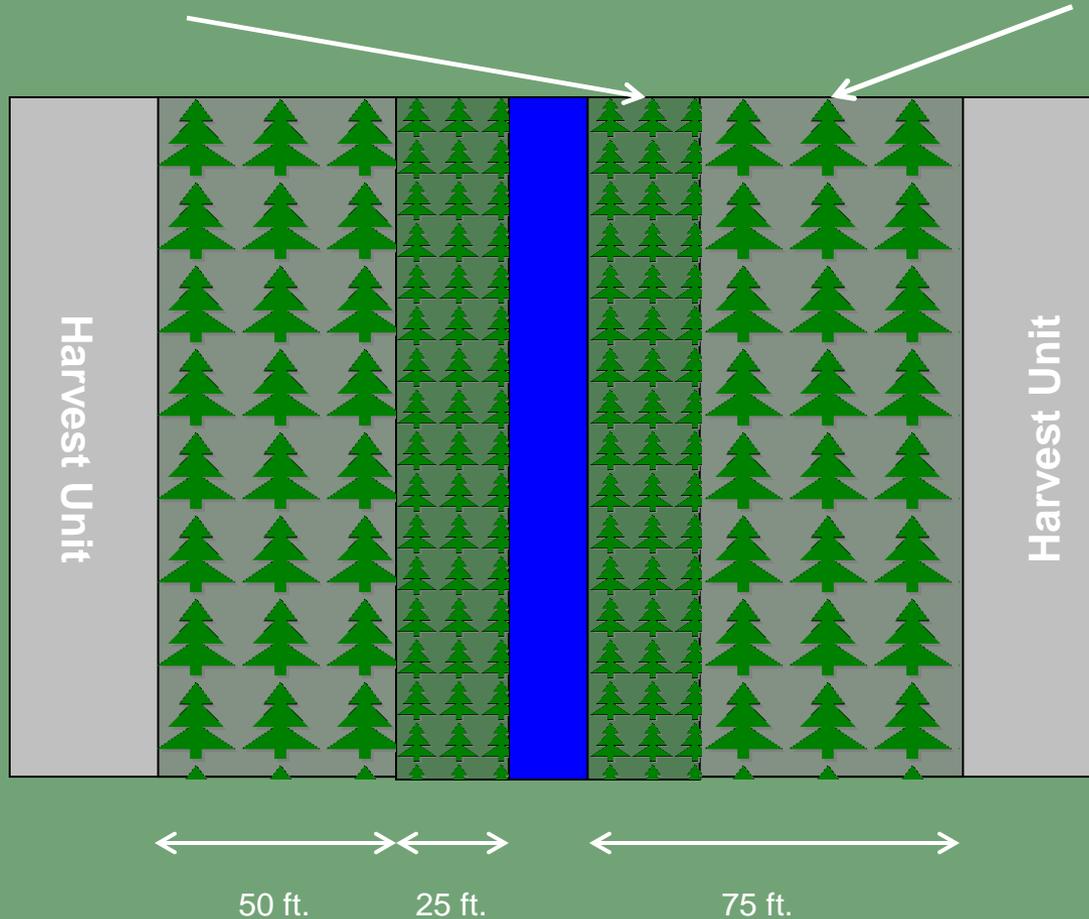
- ▶ 1. “60-30 option” - Requires more trees to be left (60 Relative Stocking) in the inner 25-ft.-wide zone right next to the stream. As long as the 60 Relative Stocking is maintained in the inner 25-ft. zone, trees can still be harvested. Fewer trees (30 Relative Stocking) are required to be left in the outer 50-ft. riparian zone (25-to-75 feet away from the stream edge).



Option 1 (60/30)

60 RS minimum in
stream-adjacent 25-ft.
zone

30 RS minimum in
25-to-75-ft. zone





Class I Stream in a Dense Forest





Is there an opportunity to harvest in the inner zone here?



Streamside Tree Retention (Shade) Rule for Class I Streams

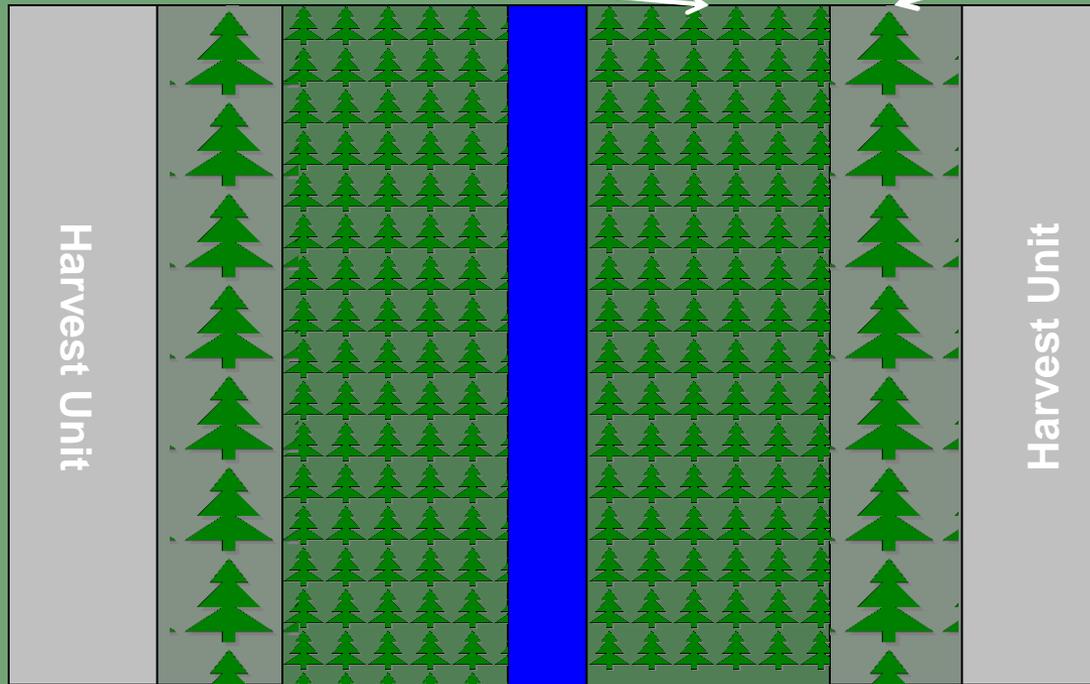
- ▶ 2. “60-10 option” - Requires more trees (60 Relative Stocking) to be retained in the inner 50-ft.-wide zone next to the stream edge. Fewer trees (10 Relative Stocking) are required in the outer 25-ft. riparian zone (50-to-75 feet away from the stream edge).



Option 2 (60/10)

60 RS minimum in
stream-adjacent 50-ft. zone

10 RS minimum in
50-to-75-ft. zone



25 ft. 50 ft. 75 ft.





Inner Zone Shade Largely Provided by Small >>>
Hardwoods



Tools

- ▶ IDL is preparing a series of tools to help landowners and foresters implement the rules on the ground
 - Spreadsheets for Laptops, Tablets, and maybe even Smart Phones
 - At least two versions
 - Forester's Forum (Handouts)
 - Worksheets
 - Publicly available Guidance documents



This is the Current Appearance of the Relative Stocking Spreadsheet

There will be At Least Two Options Developed

Forest Type:								NIGF (North Idaho Grand Fir)	
Streamside <i>Inner Zone</i> Length Surveyed (50' wide):	200								
Streamside <i>Inner Zone</i> Area Surveyed:	10000 ft. ²							0.230	acres
Total Streamside <i>Inner Zone</i> Length and Area (50' wide):	500							0.574	acres
Streamside <i>Outer Zone</i> Length Surveyed (25' wide):	200								
Streamside <i>Outer Zone</i> Area Surveyed:	5000 ft. ²							0.115	acres
Total Streamside <i>Outer Zone</i> Length and Area (25' wide):	500							0.287	acres
Diameter Class:	4-7.9"	8-11.9"	12-15.9"	16-19.9"	20-23.9"	24-27.9"	28-31.9"		
INNER ZONE (50 ft.) Minimum Required RS = 60								Starting RS/Acre:	65
Trees/Survey	20	11	8	6	3	2	1	Total No. Trees in Survey	51
Trees/Length	50	28	20	15	8	5	3	Total No. Trees in Length	128
Trees/Acre	87	48	35	26	13	9	4	Trees per Acre:	222
Trees/Survey Ret.	20	11	8	5	2	2	1	Total Retained Trees in S	49
Trees/Length Ret.	50	28	20	13	5	5	3	Total Retained Trees in L	123
Trees/Acre Retain	87	48	35	22	9	9	4	Total Retained Trees per	213
Relative Stocking per Acre	8.5	10.0	12.1	11.0	6.0	7.6	4.7	<i>Inner Zone</i> Retained Relative Stocking	60
Basal Area per Acre	17.1	26.1	37.3	38.5	23.0	32.1	21.4	<i>Inner Zone</i> Retained Basal Area/Acre	195
OUTER ZONE (25 ft.) Minimum Required RS = 10								Starting RS/Acre:	70
Trees/Survey	13	8	4	3	2	1	0	Total No. Trees in Survey	31
Trees/Length	33	20	10	8	5	3	0	Total No. Trees in Length	78
Trees/Acre	113	70	35	26	17	9	0	Trees per Acre:	270
Trees/Survey Ret.	13	5	0	1	0	1	0	Total Retained Trees in S	20
Trees/Length Ret.	33	13	0	3	0	3	0	Total Retained Trees in L	50
Trees/Acre Retain	113	44	0	9	0	9	0	Total Retained Trees per	174
Relative Stocking per Acre	11.0	9.1	0.0	4.4	0.0	7.6	0.0	<i>Outer Zone</i> Retained Relative Stocking	32
Basal Area per Acre	22.2	23.8	0.0	15.4	0.0	32.1	0.0	<i>Outer Zone</i> Retained Basal Area/Acre	94
Relative Stocking per Tree	0.097	0.209	0.347	0.506	0.683	0.878	1.088		
Basal Area per Tree	0.196	0.545	1.069	1.767	2.640	3.687	4.909		



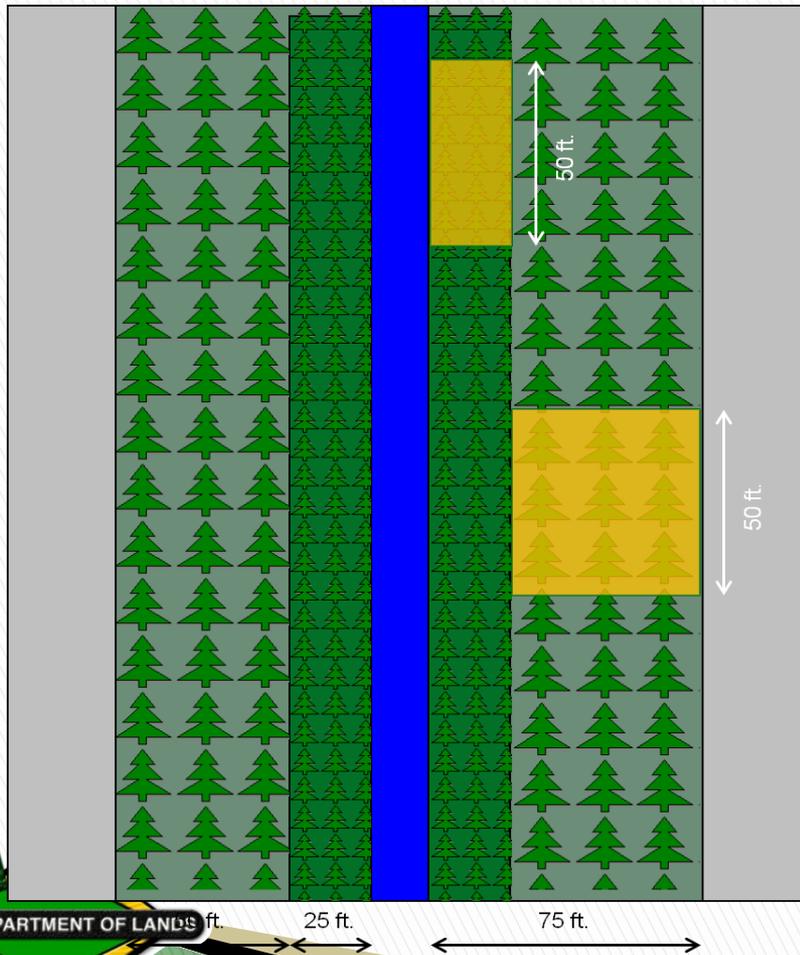
Proposed Sampling Methods

- ▶ Sampling issues are still being worked out in the development of the guidance documents
 - IDL will establish guidelines for administration of the rule
 - Proposed Plot Sizes
 - Proposed Minimum Sampling Intensity
 - Expectation of Appropriate Sampling Protocols

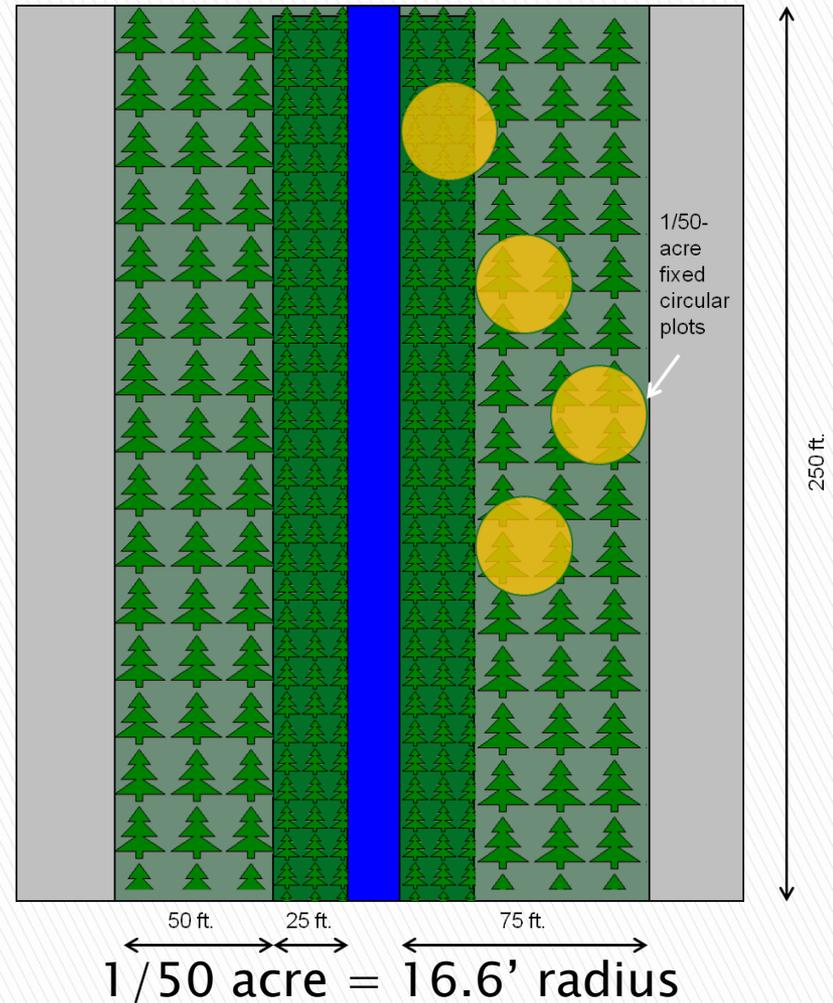


Proposed Sampling Methods

Rectangular Plots



Fixed Radius Circular Plots



60/30 Option

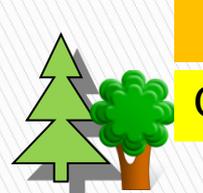
Insert Rectangular Plots

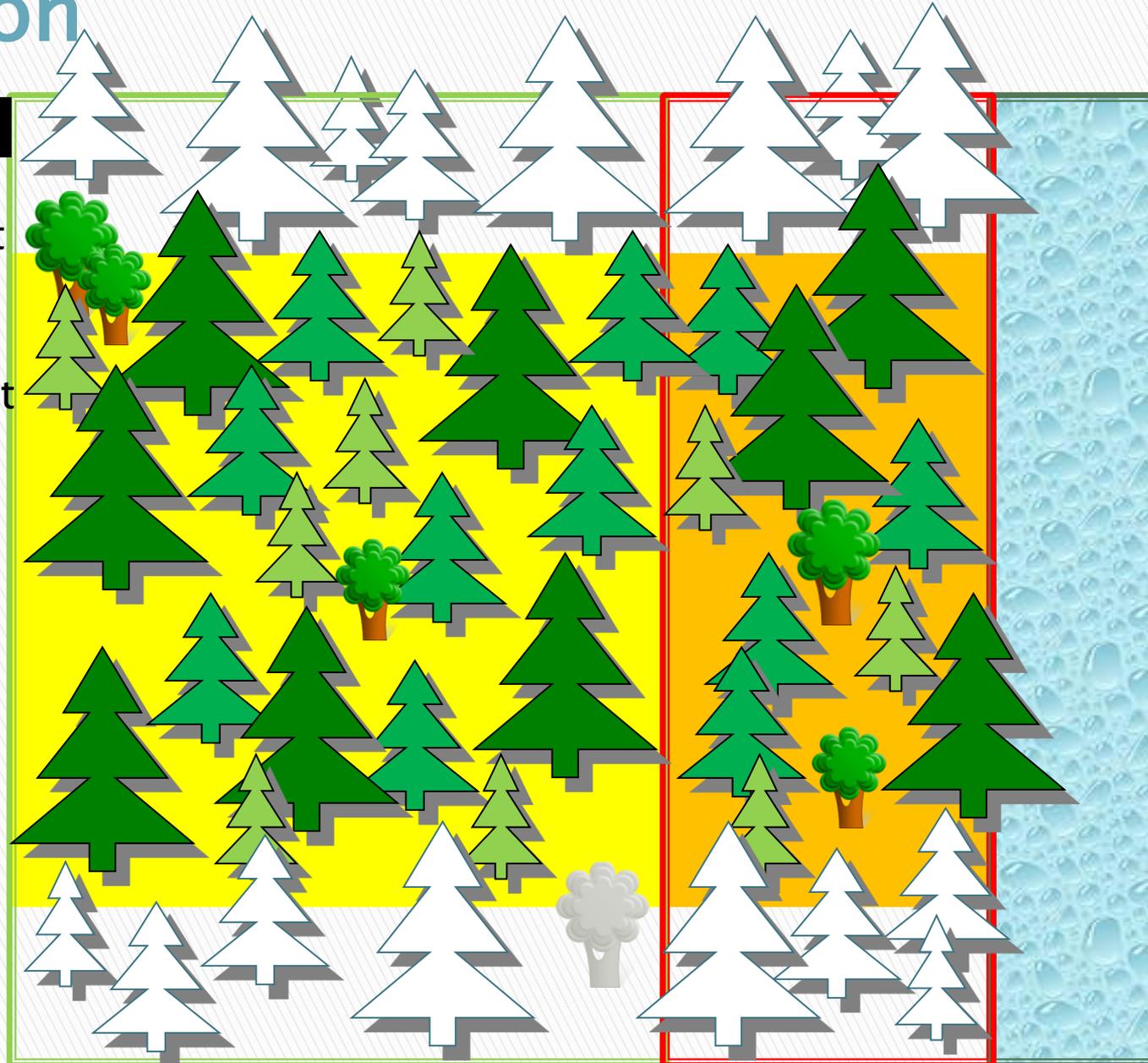
 = Inner Zone Plot
50' x 25'

 = Outer Zone Plot
50' x 50'

 Inner Zone = 3
Outer Zone = 6
= 12-15.9"

 Inner Zone = 5
Outer Zone = 8
= 8-11.9"

 Inner Zone = 4
Outer Zone = 8
= 4-7.9"



50' Outer Zone

25' Inner Zone

60/30 Option

Forest Type:	NIGF (North Idaho Grand Fir)		
Streamside <i>Inner Zone</i> Length Surveyed (25' wide):	50		
Total <i>Inner Zone</i> Area Surveyed:	1250 ft. ²	0.029 acres	
Total Streamside <i>Inner Zone</i> Length and Area (25' wide):	250	0.143 acres	
Streamside <i>Outer Zone</i> Length Surveyed (50' wide):	50		
Total <i>Outer Zone</i> Area Surveyed:	2500 ft. ²	0.057 acres	
Total Streamside <i>Outer Zone</i> Length and Area (50' wide):	250	0.287 acres	

Forest Type

Plot and Stream Reach Data

Inner Zone Tree Count

Outer Zone Tree Count

Output = RS (%)
Inner and Outer

Diameter Class:	4-7.9"	8-11.9"	12-15.9"	16-19.9"	20-23.9"	24-27.9"	28-31.9"		
INNER ZONE (25 ft.) Minimum Required RS = 60								Starting RS/Acre:	86
Trees/Survey	4	5	3	0	0	0	0	Total No. Trees in Survey	12
Trees/Length	20.0	25.0	15.0	0.0	0.0	0.0	0.0	Total No. Trees in Length	60
Trees/Acre	139.4	174.2	104.5	0.0	0.0	0.0	0.0	Trees per Acre:	418
Trees/Survey Ret	4	5	3	0	0	0	0	Total Retained Trees in S	12
Trees/Length Ret	20.0	25.0	15.0	0.0	0.0	0.0	0.0	Total Retained Trees in L	60
Trees/Acre Retain	139.4	174.2	104.5	0.0	0.0	0.0	0.0	Total Retained Trees per	418
Relative Stacking per Acre	13.5	36.4	36.3	0.0	0.0	0.0	0.0	Inner Zone Retained Relative Stocl	86
Basal Area per Acre	27.4	95.0	111.8	0.0	0.0	0.0	0.0	Inner Zone Retained Basal Area/Acr	234
OUTER ZONE (50 ft.) Minimum Required RS = 30								Starting RS/Acre:	79
Trees/Survey	8	8	6	0	0	0	0	Total No. Trees in Survey	22
Trees/Length	40.0	40.0	30.0	0.0	0.0	0.0	0.0	Total No. Trees in Length	110
Trees/Acre	139.4	139.4	104.5	0.0	0.0	0.0	0.0	Trees per Acre:	383
Trees/Survey Ret	8	8	6	0	0	0	0	Total Retained Trees in S	22
Trees/Length Ret	40.0	40.0	30.0	0.0	0.0	0.0	0.0	Total Retained Trees in L	110
Trees/Acre Retain	139.4	139.4	104.5	0.0	0.0	0.0	0.0	Total Retained Trees per	383
Relative Stacking per Acre	13.5	29.1	36.3	0.0	0.0	0.0	0.0	Outer Zone Retained Relative Stocl	79
Basal Area per Acre	27.4	76.0	111.8	0.0	0.0	0.0	0.0	Outer Zone Retained Basal Area/Acr	215



60/30 Option

Idaho FPA: Streamside Tree-Retention Zone Inventory Form									
4	Forest Type:	NIGF (North Idaho Grand Fir)							
6	Streamside Inner Zone Length Surveyed (25' wide):	50							
8	Total Inner Zone Area Surveyed:	1250 ft. ²				0.029 acres			
10	Total Streamside Inner Zone Length and Area (25' wide):	250				0.143 acres			
12	Streamside Outer Zone Length Surveyed (50' wide):	50							
14	Total Outer Zone Area Surveyed:	2500 ft. ²				0.057 acres			
16	Total Streamside Outer Zone Length and Area (50' wide):	250				0.287 acres			
18	Diameter Class:	4-7.9"	8-11.9"	12-15.9"	16-19.9"	20-23.9"	24-27.9"	28-31.9"	
19	INNER ZONE (25 ft.) Minimum Required RS = 60								Starting RS/Acre: 86
20	Trees/Survey	4	5	3	0	0	0	0	Total No. Trees in Survey: 12
21	Trees/Length	20.0	25.0	15.0	0.0	0.0	0.0	0.0	Total No. Trees in Length: 60
22	Trees/Acre	139.4	174.2	104.5	0.0	0.0	0.0	0.0	Trees per Acre: 418
23	Trees/Survey Ret	4	3	2	0	0	0	0	Total Retained Trees in S: 9
24	Trees/Length Ret	20.0	15.0	10.0	0.0	0.0	0.0	0.0	Total Retained Trees in L: 45
25	Trees/Acre Retain	139.4	104.5	69.7	0.0	0.0	0.0	0.0	Total Retained Trees per Acre: 314
26	Relative Stocking per Acre	13.5	21.8	24.2	0.0	0.0	0.0	0.0	Inner Zone Retained Relative Stocking: 60
27	Basal Area per Acre	27.4	57.0	74.5	0.0	0.0	0.0	0.0	Inner Zone Retained Basal Area per Acre: 159
32	OUTER ZONE (50 ft.) Minimum Required RS = 30								Starting RS/Acre: 79
33	Trees/Survey	8	8	6	0	0	0	0	Total No. Trees in Survey: 22
34	Trees/Length	40.0	40.0	30.0	0.0	0.0	0.0	0.0	Total No. Trees in Length: 110
35	Trees/Acre	139.4	139.4	104.5	0.0	0.0	0.0	0.0	Trees per Acre: 383
36	Trees/Survey Ret	6	4	1	0	0	0	0	Total Retained Trees in S: 11
37	Trees/Length Ret	30.0	20.0	10.0	0.0	0.0	0.0	0.0	Total Retained Trees in L: 55
38	Trees/Acre Retain	104.5	69.7	17.4	0.0	0.0	0.0	0.0	Total Retained Trees per Acre: 192
39	Relative Stocking per Acre	10.1	14.6	6.0	0.0	0.0	0.0	0.0	Outer Zone Retained Relative Stocking: 31
40	Basal Area per Acre	20.5	38.0	18.6	0.0	0.0	0.0	0.0	Outer Zone Retained Basal Area per Acre: 77

Retained Trees (Inner)

Start RS = 86

End RS = 60

Retained Trees (Outer)

Start RS = 79

End RS = 31



60/30 Option

 = Inner Zone Plot
50' x 25'

 = Outer Zone Plot
50' x 50'

 Inner Zone = 3/2

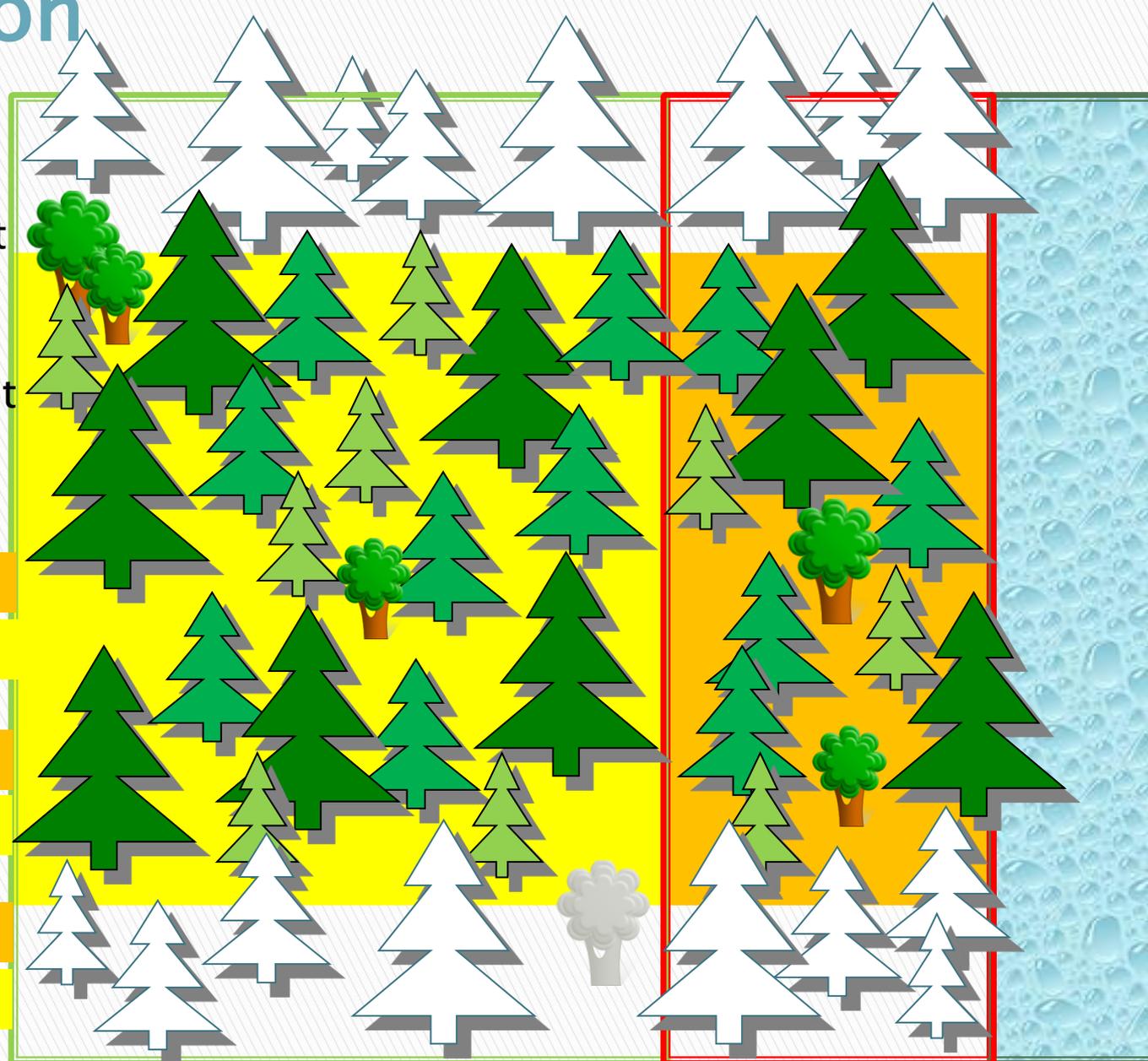
 Outer Zone = 6/1
= 12-15.9"

 Inner Zone = 5/3

 Outer Zone = 8/4
= 8-11.9"

 Inner Zone = 4/4

 Outer Zone = 8/6
= 4-7.9"



50' Outer Zone

25' Inner Zone

60/10 Option

Insert Rectangular Plots

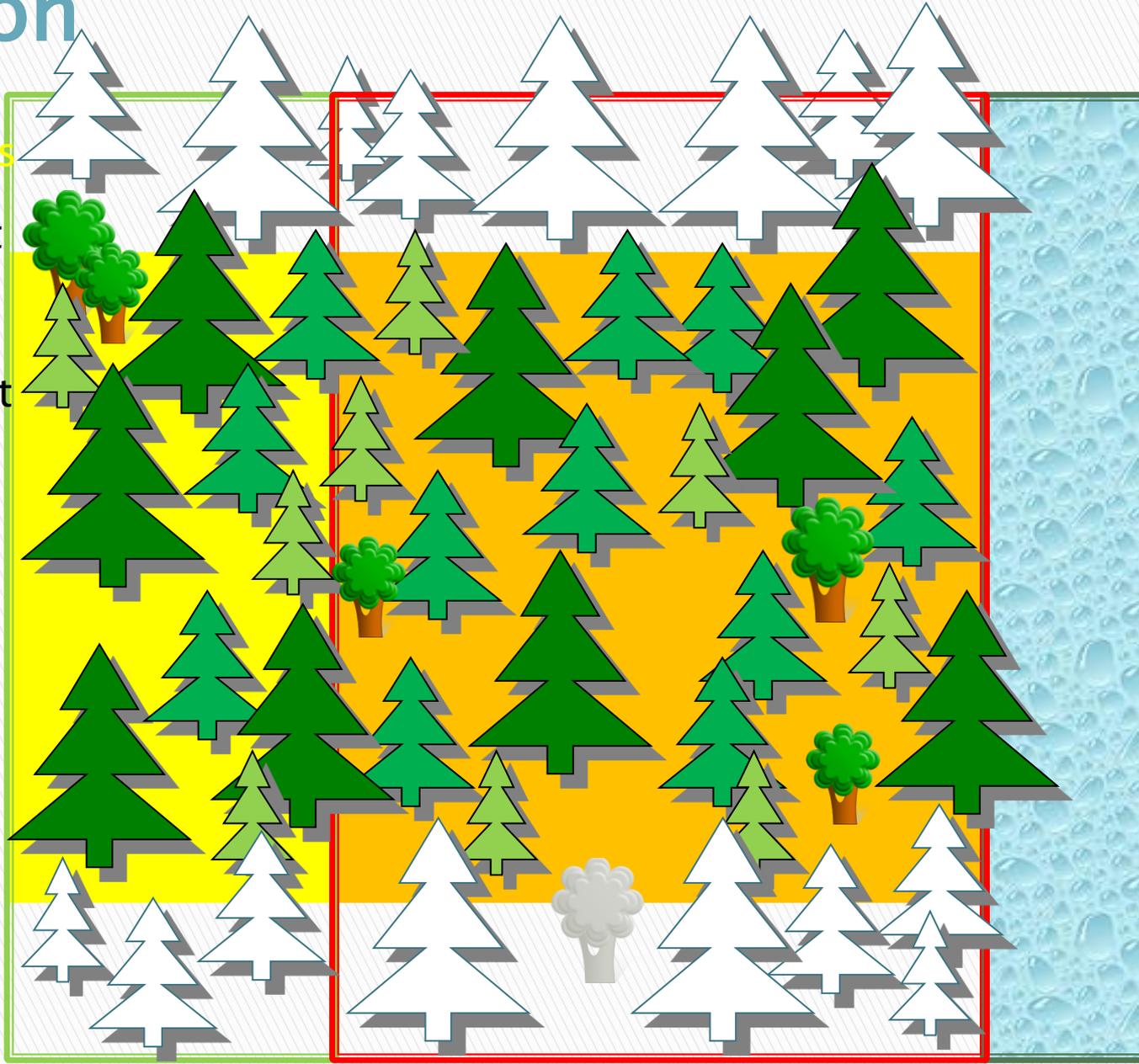
 = Inner Zone Plot
50' x 50'

 = Outer Zone Plot
50' x 25'

 Inner Zone = 5
Outer Zone = 4
= 12-15.9"

 Inner Zone = 9
Outer Zone = 4
= 8-11.9"

 Inner Zone = 8
Outer Zone = 4
= 4-7.9"



50' Outer Zone

25' Inner Zone

60/10 Option

Forest Type:	NIGF (North Idaho Grand Fir)	
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Streamside <i>Inner Zone</i> Area Surveyed:	2500 ft. ²	0.057 acres
Total Streamside <i>Inner Zone</i> Length and Area (50' wide):	250	0.287 acres
Streamside <i>Outer Zone</i> Length Surveyed (25' wide):	50	
Streamside <i>Outer Zone</i> Area Surveyed:	1250 ft. ²	0.029 acres
Total Streamside <i>Outer Zone</i> Length and Area (25' wide):	250	0.143 acres

Forest Type

Plot and Stream Reach Data

Inner Zone Tree Count

Outer Zone Tree Count

Output = RS (%)

Inner and Outer

Diameter Class:	4-7.9"	8-11.9"	12-15.9"	16-19.9"	20-23.9"	24-27.9"	28-31.9"		
INNER ZONE (50 ft.) Minimum Required RS = 60								Starting RS/Acre:	77
Trees/Survey	8	9	5	0	0	0	0	Total No. Trees in Survey	22
Trees/Length	40	45	25	0	0	0	0	Total No. Trees in Length	110
Trees/Acre	139	157	87	0	0	0	0	Trees per Acre:	383
Trees/Survey Ret	8	9	5	0	0	0	0	Total Retained Trees in S	22
Trees/Length Ret	40	45	25	0	0	0	0	Total Retained Trees in L	110
Trees/Acre Retain	139	157	87	0	0	0	0	Total Retained Trees per	383
Relative Stocking per Acre	13.5	32.8	30.2	0.0	0.0	0.0	0.0	Inner Zone Retained Relative Stocking	77
Basal Area per Acre	27.4	85.5	93.1	0.0	0.0	0.0	0.0	Inner Zone Retained Basal Area/Acre	206

OUTER ZONE (25 ft.) Minimum Required RS = 10								Starting RS/Acre:	91
Trees/Survey	4	4	4	0	0	0	0	Total No. Trees in Survey	12
Trees/Length	20	20	20	0	0	0	0	Total No. Trees in Length	60
Trees/Acre	139	139	139	0	0	0	0	Trees per Acre:	418
Trees/Survey Ret	4	4	4	0	0	0	0	Total Retained Trees in S	12
Trees/Length Ret	20	20	20	0	0	0	0	Total Retained Trees in L	60
Trees/Acre Retain	139	139	139	0	0	0	0	Total Retained Trees per	418
Relative Stocking per Acre	13.5	29.1	48.4	0.0	0.0	0.0	0.0	Outer Zone Retained Relative Stocking	91
Basal Area per Acre	27.4	76.0	149.0	0.0	0.0	0.0	0.0	Outer Zone Retained Basal Area/Acre	252



60/10 Option

Forest Type:								NIGF (North Idaho Grand Fir)	
Streamside Inner Zone Length Surveyed (50' wide):								50	
Streamside Inner Zone Area Surveyed:								2500 ft. ² 0.057 acres	
Total Streamside Inner Zone Length and Area (50' wide):								250 0.287 acres	
Streamside Outer Zone Length Surveyed (25' wide):								50	
Streamside Outer Zone Area Surveyed:								1250 ft. ² 0.029 acres	
Total Streamside Outer Zone Length and Area (25' wide):								250 0.143 acres	
Diameter Class:	4-7.9"	8-11.9"	12-15.9"	16-19.9"	20-23.9"	24-27.9"	28-31.9"		
INNER ZONE (50 ft.) Minimum Required RS = 60								Starting RS/Acre: 77	
Trees/Survey	8	9	5	0	0	0	0	Total No. Trees in Survey 27	
Trees/Length	40	45	25	0	0	0	0	Total No. Trees in Length 110	
Trees/Acre	139	137	87	0	0	0	0	Trees per Acre: 383	
Trees/Survey Ret	8	8	3	0	0	0	0	Total Retained Trees in S 19	
Trees/Length Ret	40	40	15	0	0	0	0	Total Retained Trees in L 95	
Trees/Acre Retain	139	139	52	0	0	0	0	Total Retained Trees per 331	
Relative Stocking per Acre	13.5	29.1	18.1	0.0	0.0	0.0	0.0	Inner Zone Retained Relative Stocking 61	
Basal Area per Acre	27.4	76.0	55.9	0.0	0.0	0.0	0.0	Inner Zone Retained Basal Area/Acr 159	
OUTER ZONE (25 ft.) Minimum Required RS = 10								Starting RS/Acre: 91	
Trees/Survey	4	4	4	0	0	0	0	Total No. Trees in Survey 12	
Trees/Length	20	20	20	0	0	0	0	Total No. Trees in Length 60	
Trees/Acre	139	139	139	0	0	0	0	Trees per Acre: 418	
Trees/Survey Ret	1	1	0	0	0	0	0	Total Retained Trees in S 2	
Trees/Length Ret	5	5	0	0	0	0	0	Total Retained Trees in L 10	
Trees/Acre Retain	35	35	0	0	0	0	0	Total Retained Trees per 70	
Relative Stocking per Acre	3.4	7.3	0.0	0.0	0.0	0.0	0.0	Outer Zone Retained Relative Stocking 11	
Basal Area per Acre	6.8	19.0	0.0	0.0	0.0	0.0	0.0	Outer Zone Retained Basal Area/Acr 26	

Retained Trees (Inner)

Start RS = 77

End RS = 61

Retained Trees (Outer)

Start RS = 91

End RS = 11



60/10 Option

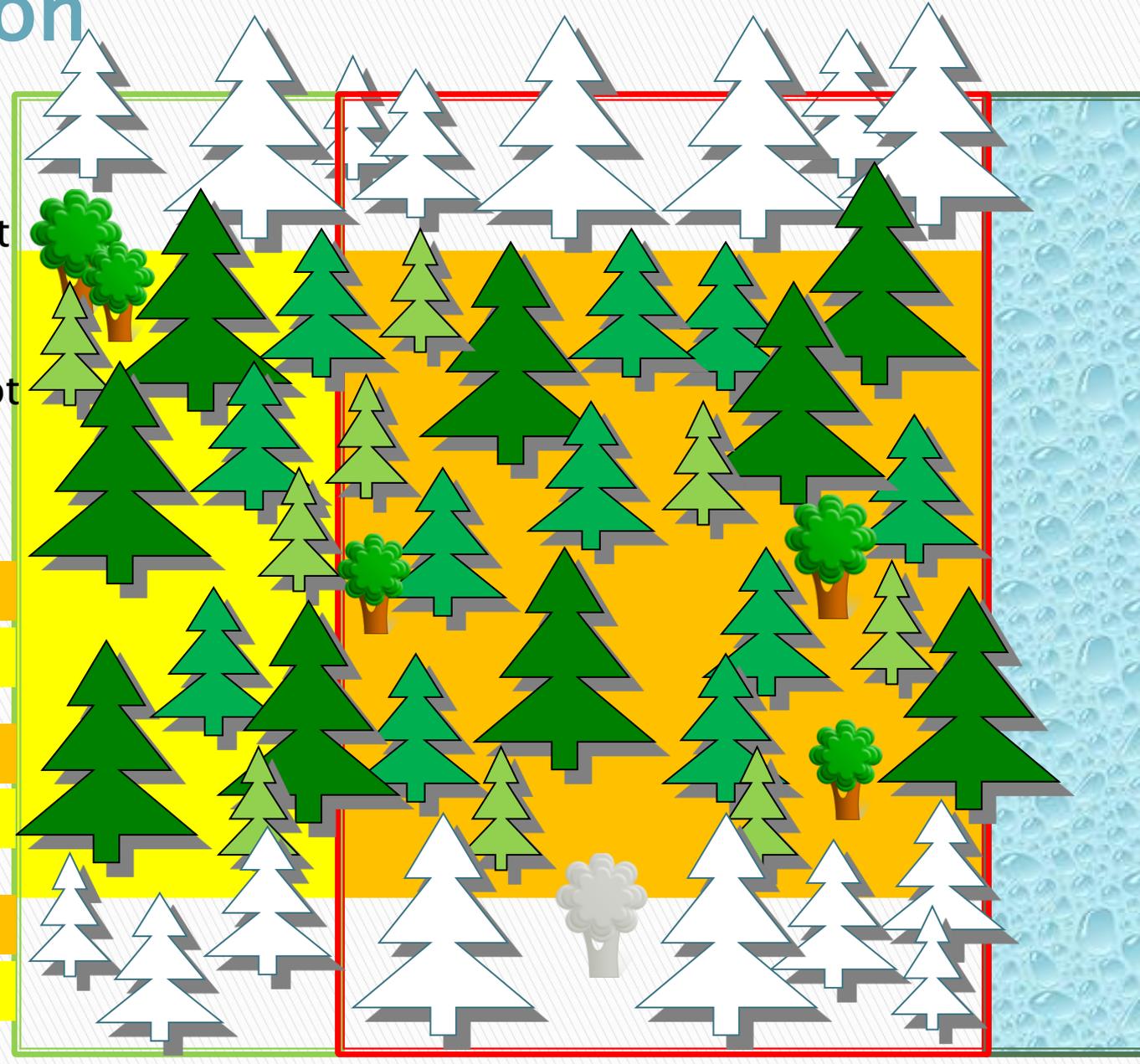
 = Inner Zone Plot
50' x 50'

 = Outer Zone Plot
50' x 25'

 Inner Zone = 5/3
Outer Zone = 4/0
= 12-15.9"

 Inner Zone = 9/8
Outer Zone = 4/1
= 8-11.9"

 Inner Zone = 8/8
Outer Zone = 4/1
= 4-7.9"



← 50' Outer Zone 25' Inner Zone →

“LAWS ARE LIKE SAUSAGES,
IT IS BETTER NOT
TO SEE THEM
BEING MADE”

Otto von Bismark





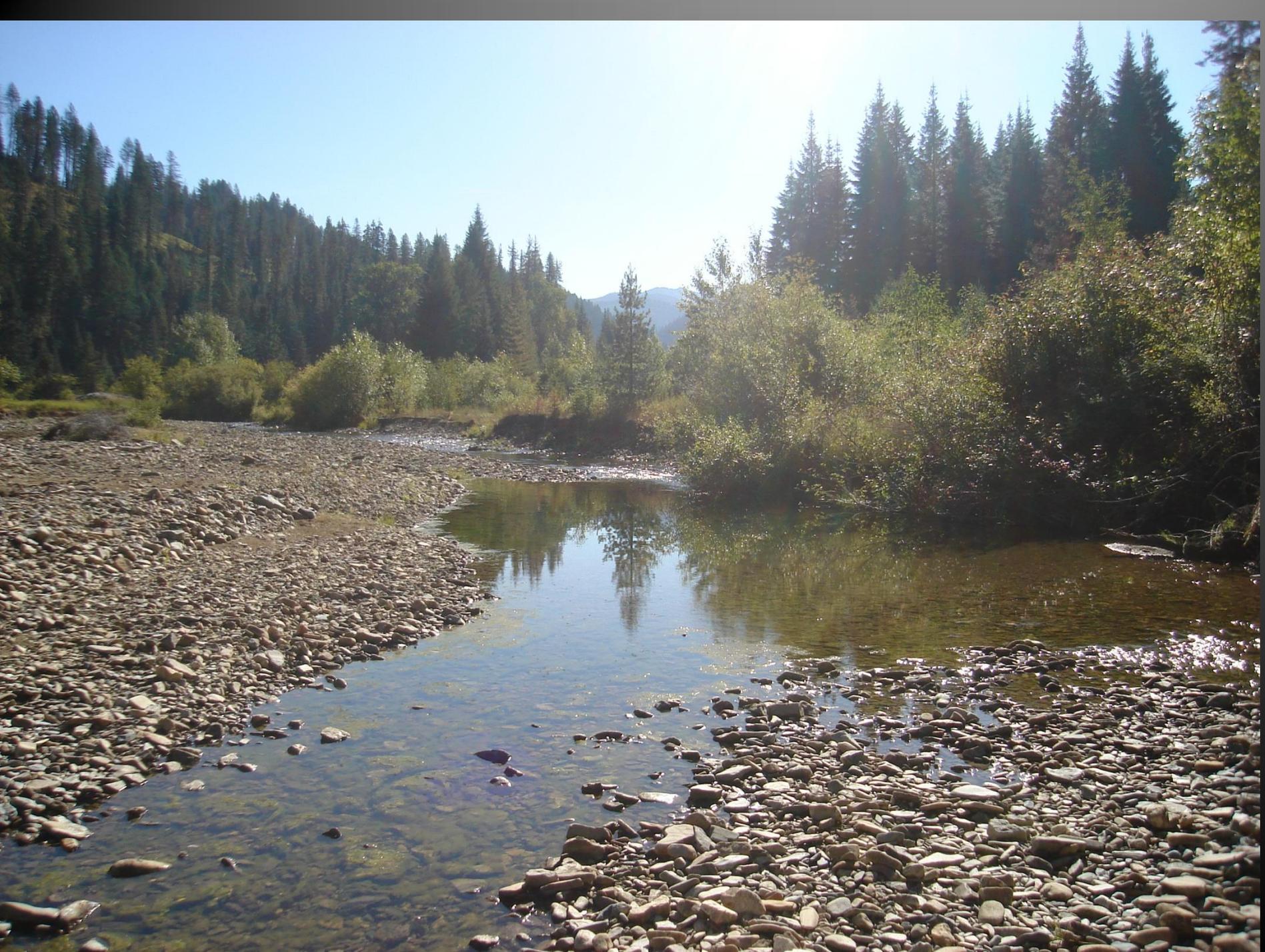




THIS IS NOT THE IDEAL STREAM SHADE >>













60/30 Option

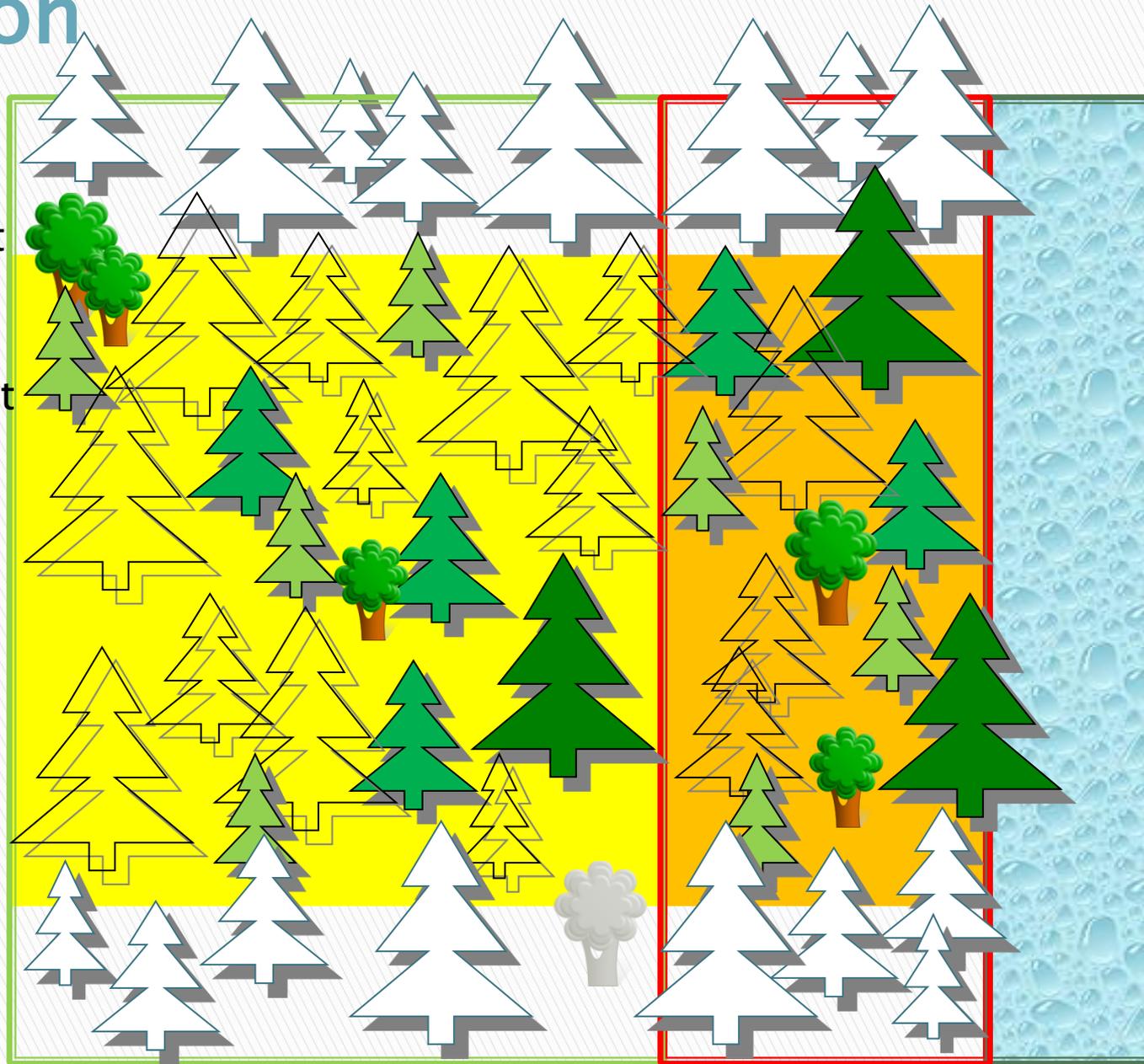
 = Inner Zone Plot
50' x 25'

 = Outer Zone Plot
50' x 50'

 Inner Zone = 2
Outer Zone = 1
= 12-15.9"

 Inner Zone = 3
Outer Zone = 4
= 8-11.9"

 Inner Zone = 4
Outer Zone = 6
= 4-7.9"



50' Outer Zone

25' Inner Zone