Washington State Forest Practices Adaptive Management Program

Lori Clark
Adaptive Management Program Administrator

Forest Practices Board
February 2025

Westside Type F Riparian Prescription Monitoring Project- Riparian Management Zone Exploratory Study (Westside Type F Exploratory Study)

TFW Policy unanimously approved the following motion: “following TFW Policy’s acceptance of the Westside Type F Exploratory Report and the agreement that the report does not warrant a rule change by the FPB, the following actions will be taken:

1. Request the AMPA to forward and facilitate a presentation by the PIs to the FPB.
2. TFW Policy to initiate a dialogue with CMER on the Type F Experimental Buffer Treatment Project (ex. 25-27 CMER Work Plan 5.3.7.3)

Westside Type F Riparian Management Zone Exploratory Study Findings

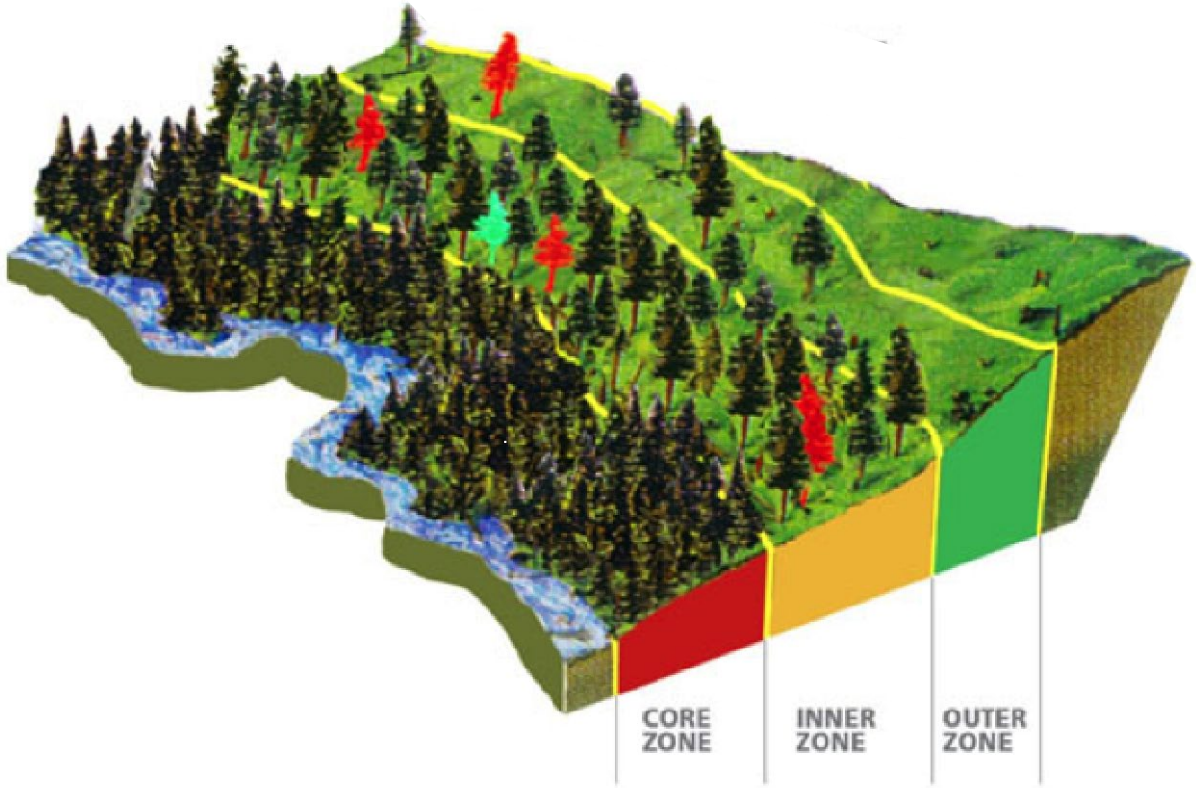
Presentation to the Washington Forest Practices Board

February 12, 2025

Jenelle Black
NWIFC CMER Staff Scientist

Westside Type F (and S) Riparian Prescriptions

- Total RMZ width is ¾ the 100-year site potential tree height, based on local “site class”
- Managed in three zones
  - Core (50-feet)
    - no-harvest
  - Inner (middle zone)
    - sometimes can have some harvest
  - Outer
    - leave twenty 12”-plus conifer trees/acre



Westside Type F (and S) Riparian Prescriptions

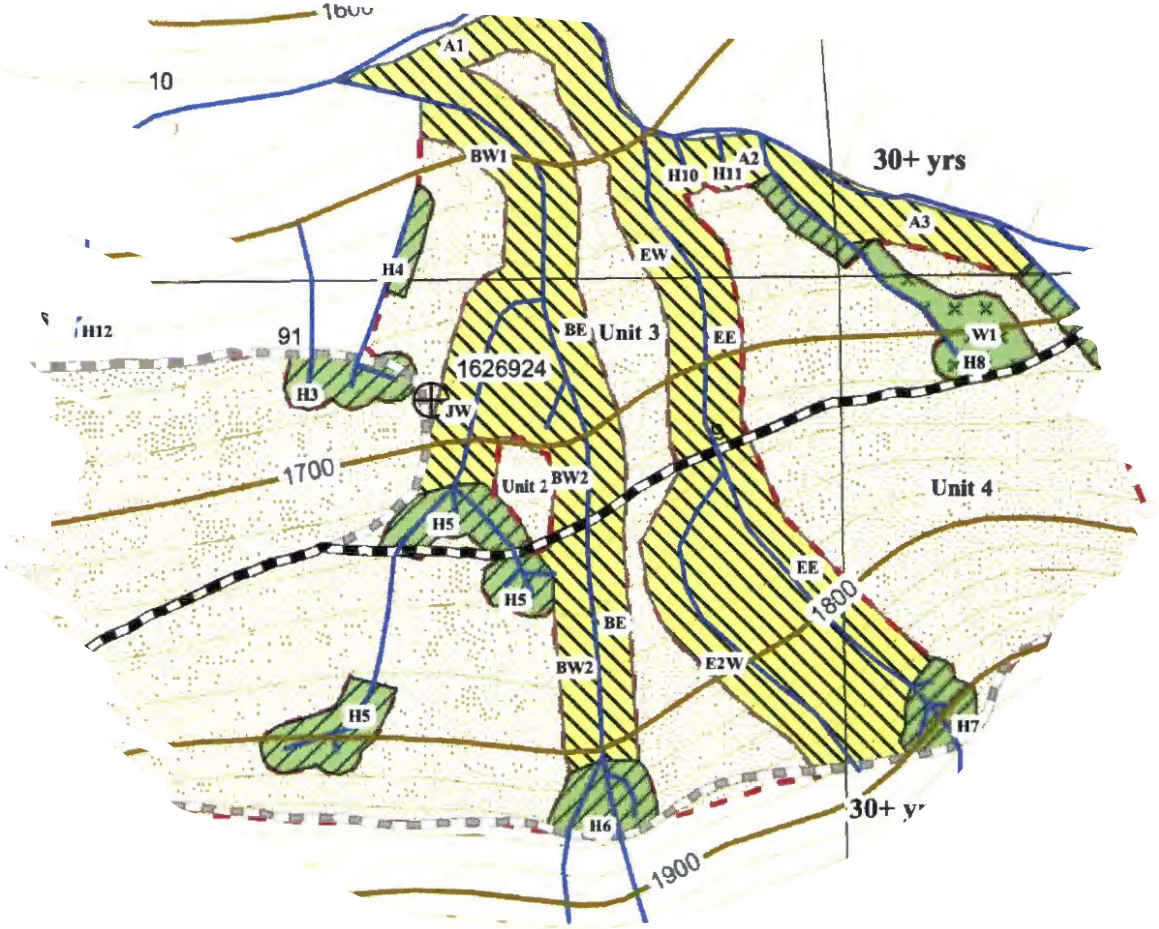
- **25 potential standard RMZ Prescriptions**

- Based on site class, stream width (> or < 10’)
- Two Inner Zone harvest options when enough basal area
  - Thin From Below (TFB)
  - Leave Trees Closest to the Water (LTCW)

Site Class	Prescription Variant: Stream Width Category	Prescription Variant: Inner Zone Harvest Treatment**	Total RMZ Width (ft)	Core Zone No Harvest Width (ft)	Inner Zone Width (ft)	Outer Zone Width (ft)	No-Cut Core+IZ “Floor” for LTCW (ft)***
I	large*	No IZ harvest	200	50	100	50	
I	large	Option 1- TFB					
I	large	Option 2- LTCW			84	66	100
I	small*	No IZ harvest	200	50	83	67	
I	small	Option 1- TFB					
I	small	Option 2- LTCW			84	66	80
II	large	No IZ harvest	170	50	78	42	
II	large	Option 1- TFB					
II	large	Option 2- LTCW			70	50	100
II	small	No IZ harvest	170	50	63	57	
II	small	Option 1- TFB					
II	small	Option 2- LTCW			64	56	80
III	large	No IZ harvest	140	50	55	35	
III	large	Option 1- TFB					
III	small	No IZ harvest	140	50	43	47	
III	small	Option 1- TFB					
III	small	Option 2- LTCW			44	46	80
IV	large	No IZ harvest	110	50	33	27	
IV	large	Option 1- TFB					
IV	small	No IZ harvest	110	50	23	37	
IV	small	Option 1- TFB					
V	large	No IZ harvest	90	50		22	
V	large	Option 1- TFB[1]					
V	small	No IZ harvest	90	50	10	30	
V	small	Option 1- TFB[1]					

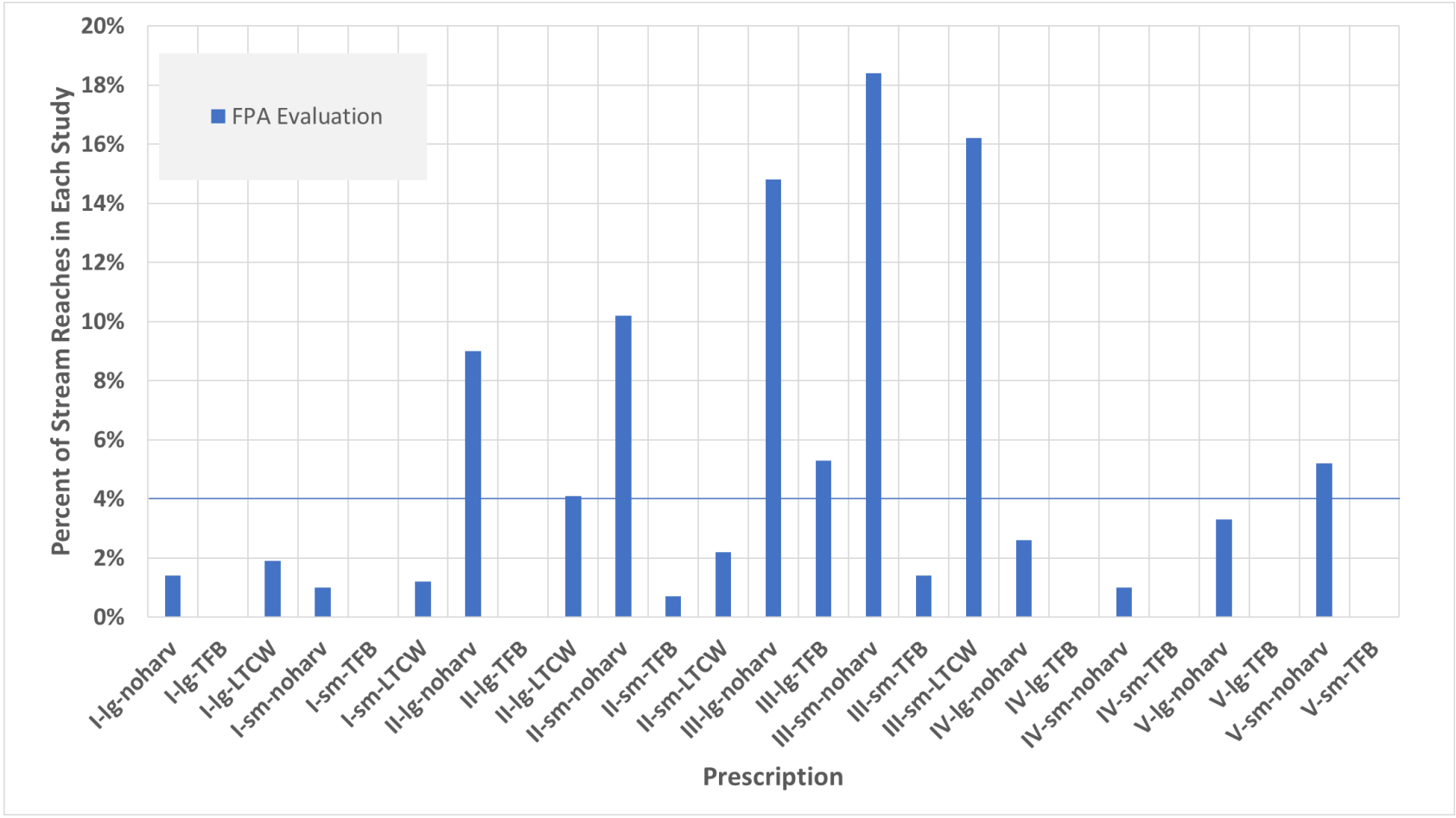
Phase 1 - FPA GIS Analysis

- Purpose: Determine how frequently different prescriptions are used
- Random sample of 170 FPAs with harvest along a Type F or S stream using standard rules; 2008 - 2013
- 560 Type F/S RMZs



Phase 1 - FPA GIS Analysis

- 8 prescriptions accounted for 83% of the Type F RMZs
- 8 prescriptions were not used at all
- TFB was used on 7% of the buffers while LTCW was used in 26% of the buffers



Phase 2 - Exploratory study

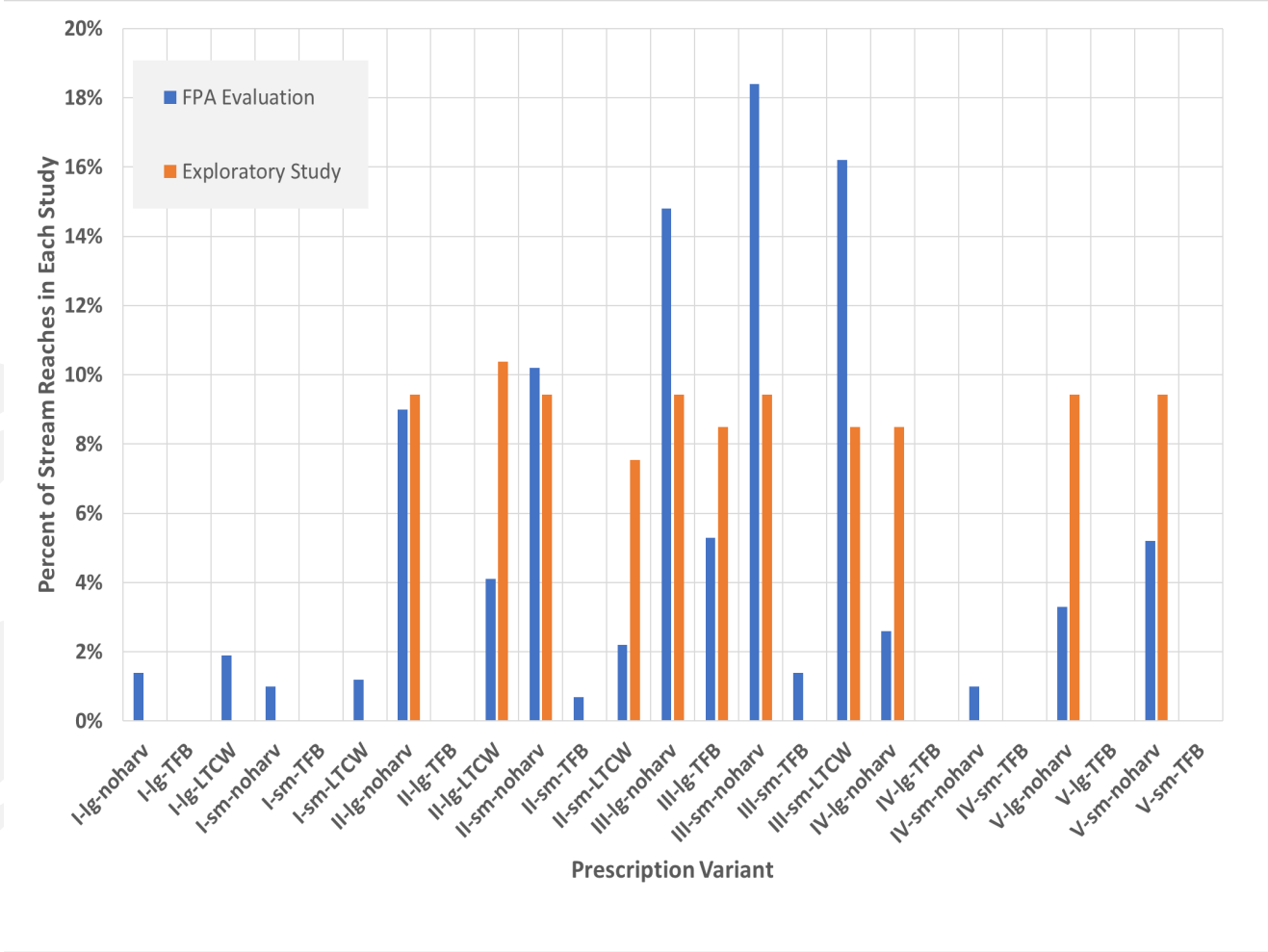
Purpose -

- To better define the population of interest for the Type F riparian prescription effectiveness study by providing information on:
  - condition of riparian stands
  - level of functions associated with different prescription variants

- Trajectory to achieve DFC targets at sites with and without inner zone harvest.

Study Approach

- Measured riparian timber stand and site data in 106 randomly-selected RMZs
  - Approximately 10 sites in each of 11 prescriptions
- At a time between three and six years after harvest (“3-6 years”)



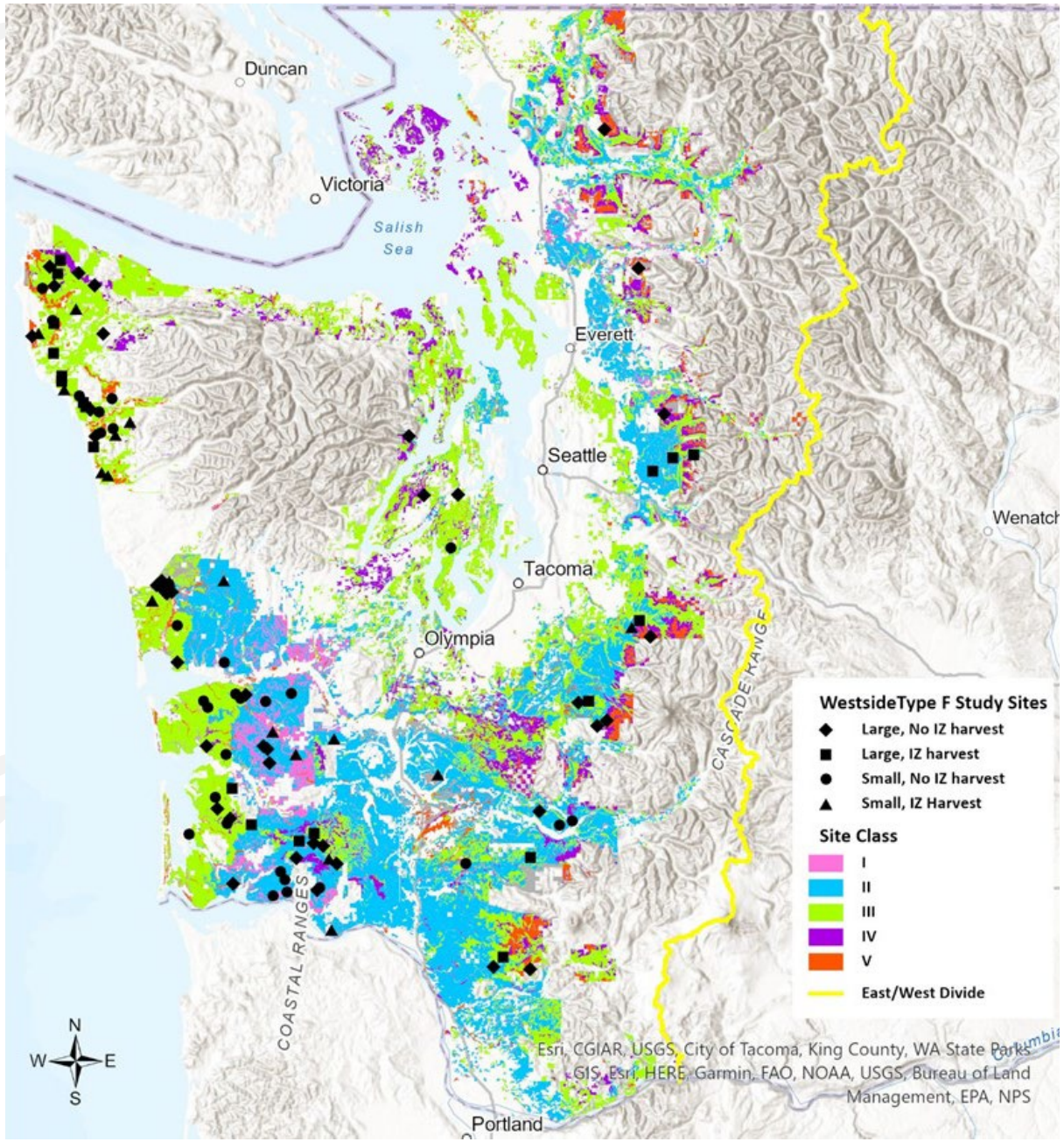
Focused on Riparian Functions of:

- Shade
  - canopy closure used as surrogate
- Large wood recruitment to streams
- Erosion prevention and sediment filtering

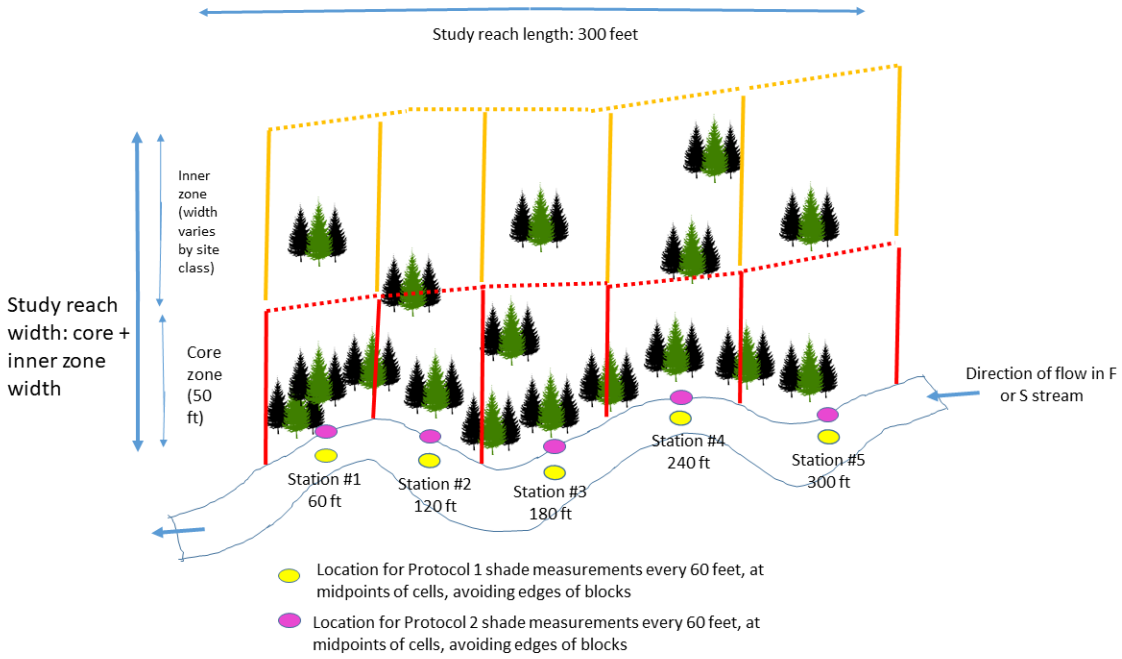
Study Sites

Distributed around Western WA CMERlands

- Heaviest in coastal region, esp. NW Coast
- Site Classes II and III most highly represented in CMERlands and in Rx



Study Site Layout



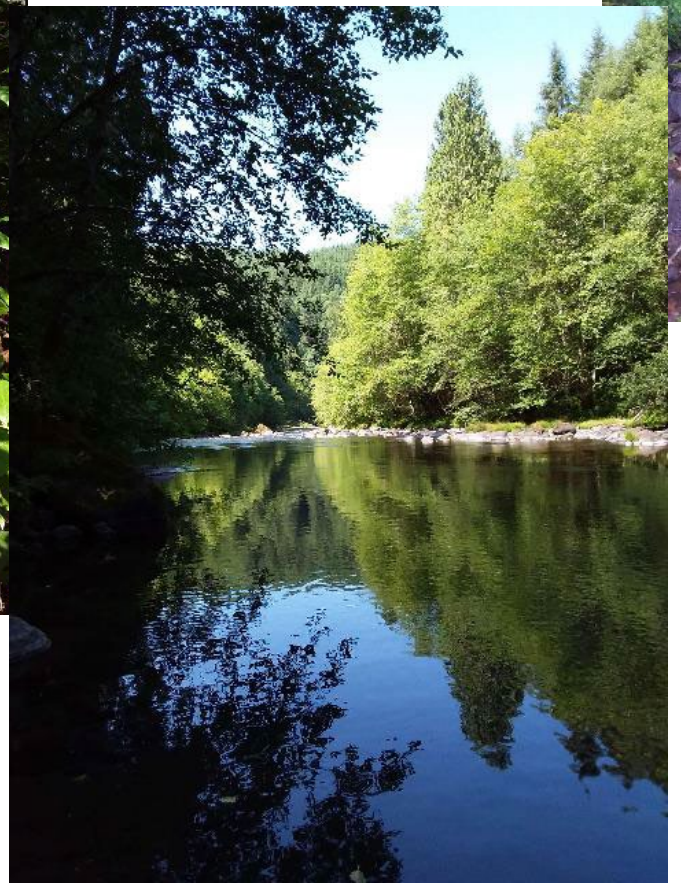
- 300-foot long study segments
- Only one side of stream

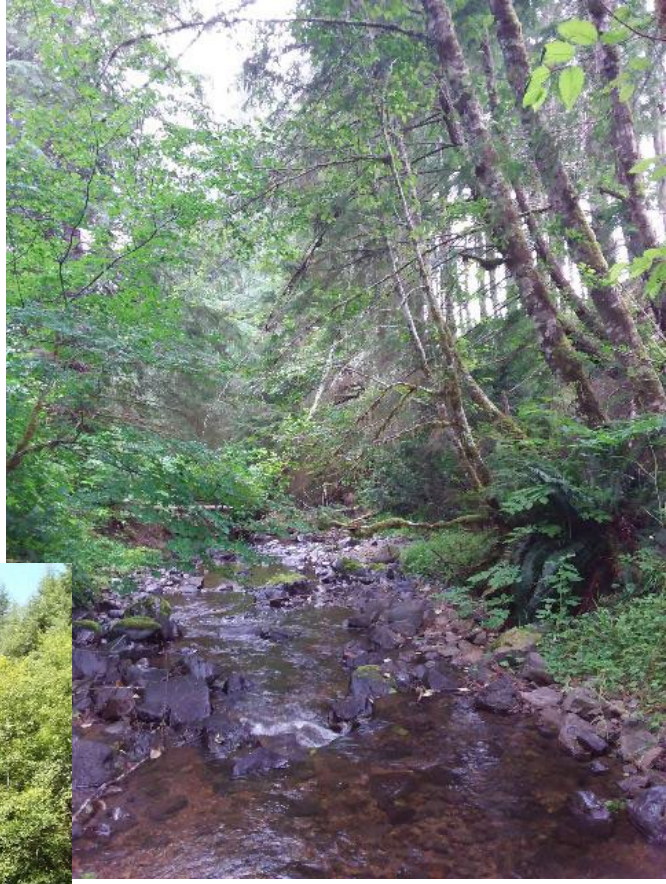
Data Collection

- Stand characteristics
  - Every tree
- Mortality
  - only that occurring since harvest
  - both standing and fallen trees/wood
- Canopy closure
- Instream wood
- Evidence of erosion related to harvesting

Stand Characteristics

- A wide range of conditions





- High variability

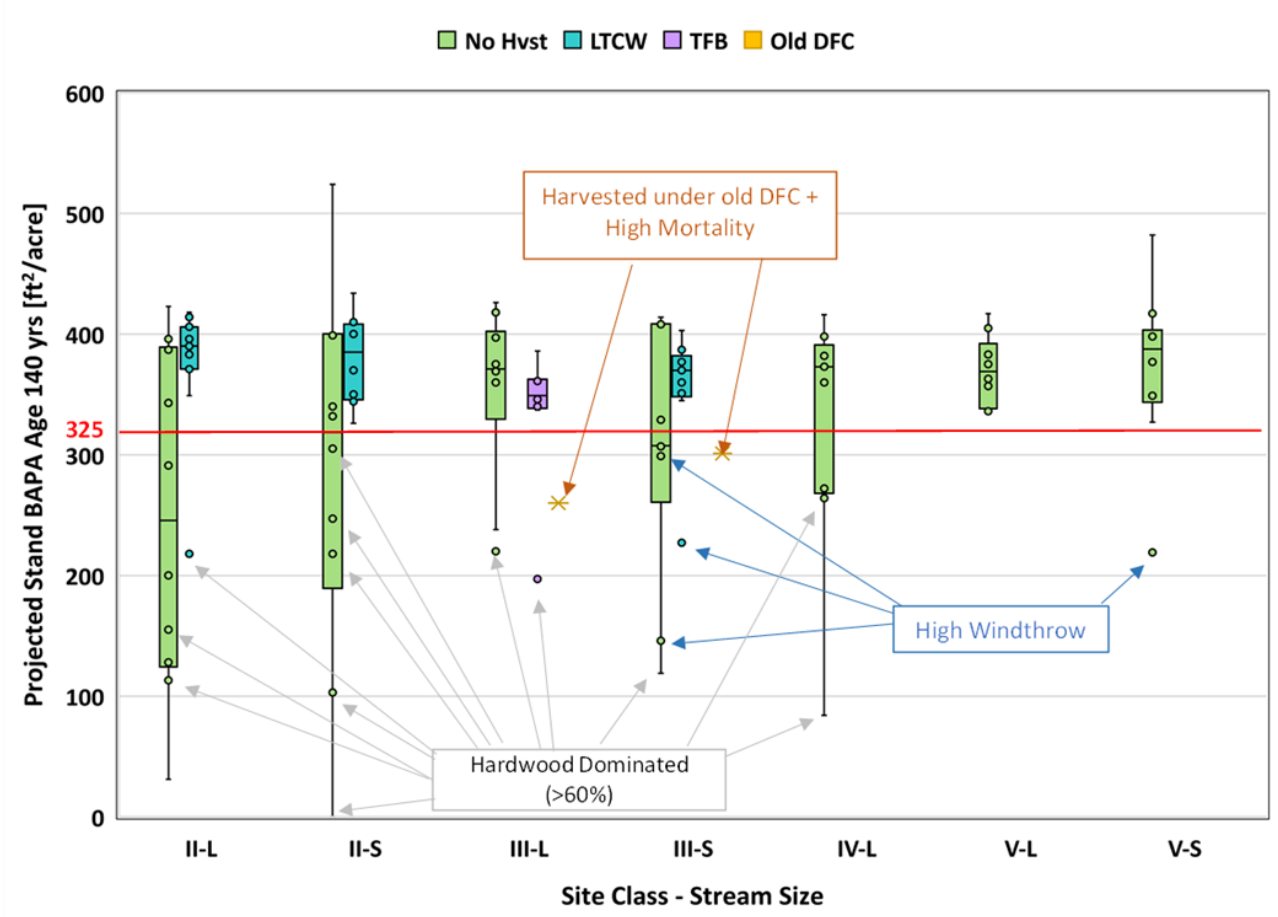
Stand Characteristics

- BUT, overall, stands typically dense and consist of young, small conifer trees
- In stem exclusion phase of development

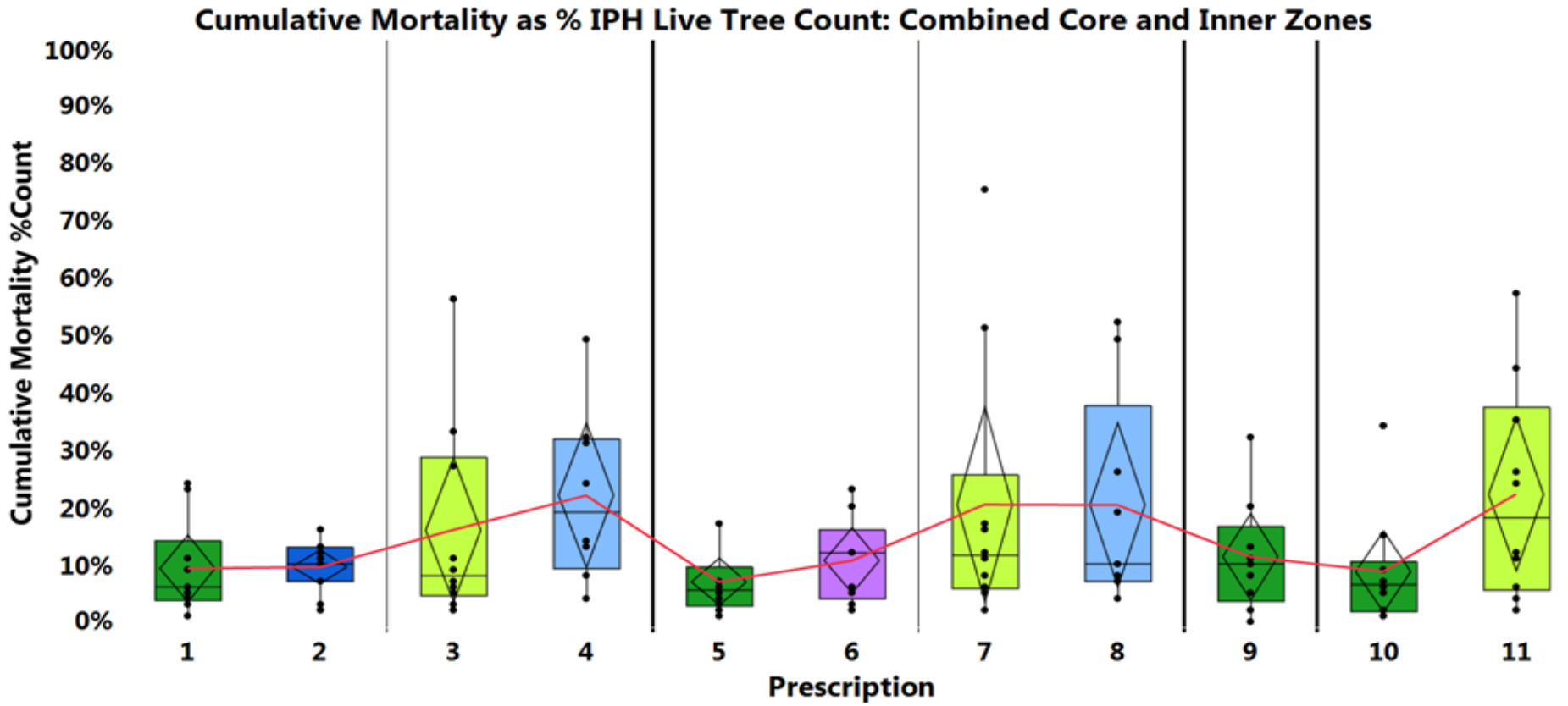
	Median	Range
Stand Age	42 yrs	30 - 116
Stem Density	209 trees/acre	47 - 846
Stem Diameter (QMD)	14"	8” – 26”
Conifer Fraction	83%	0% – 100%
Relative Density	**53**	14 – 113
Tree Species Richness	4	2 - 8

DFC Projections

- 75% of ALL sites are projected to meet DFC basal area at 140 years
- 92% of sites that had Inner Zone harvest still projected to meet DFC BAPA target

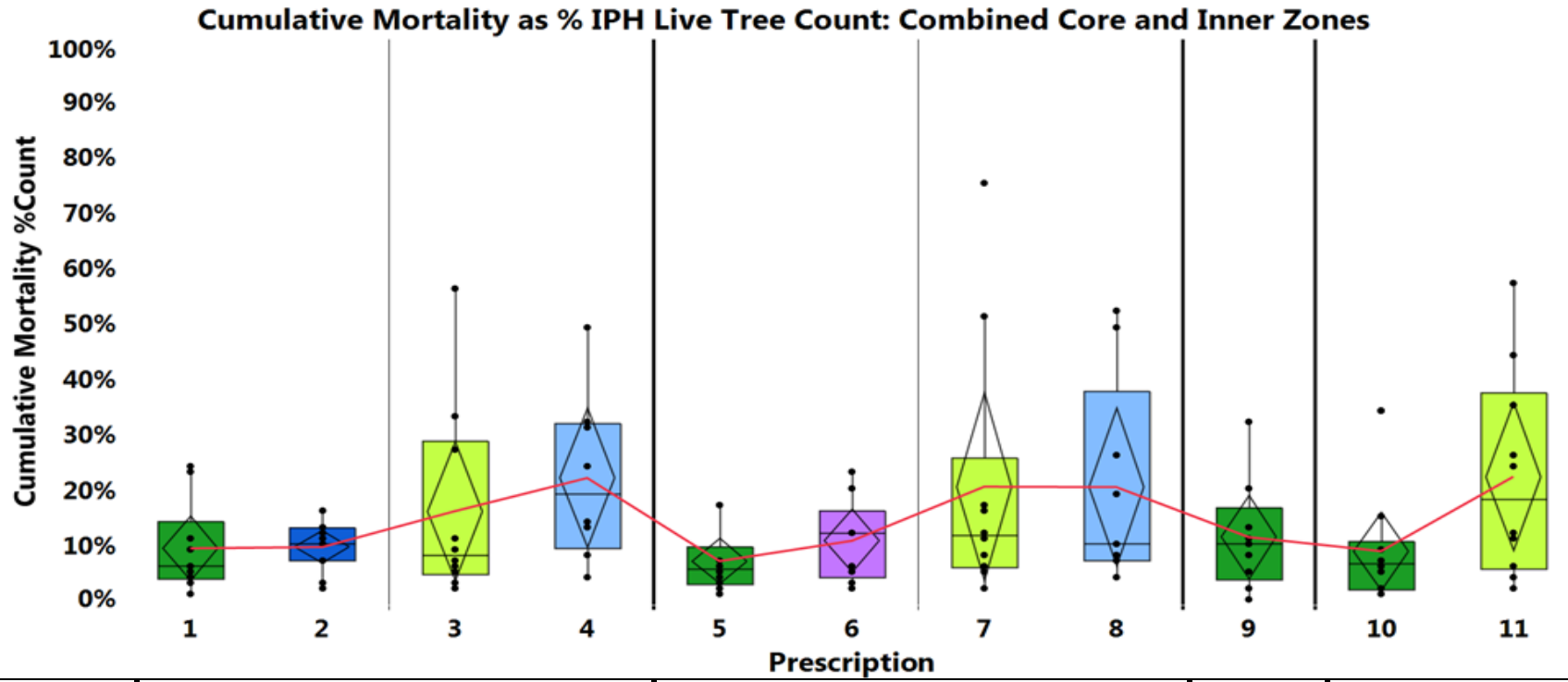


Mortality



Site Class	II				III				IV	V	
Width	L		S		L		S		L	L	S
IZ Harvest	No	LTCW	No	LTCW	No	TFB	No	LTCW	No	No	No
N	10	11	10	8	10	9	10	9	9	10	10

- Mortality greater on small streams



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IZ Harvest	No	LTCW	No	LTCW	No	TFB	No	LTCW	No	No	No
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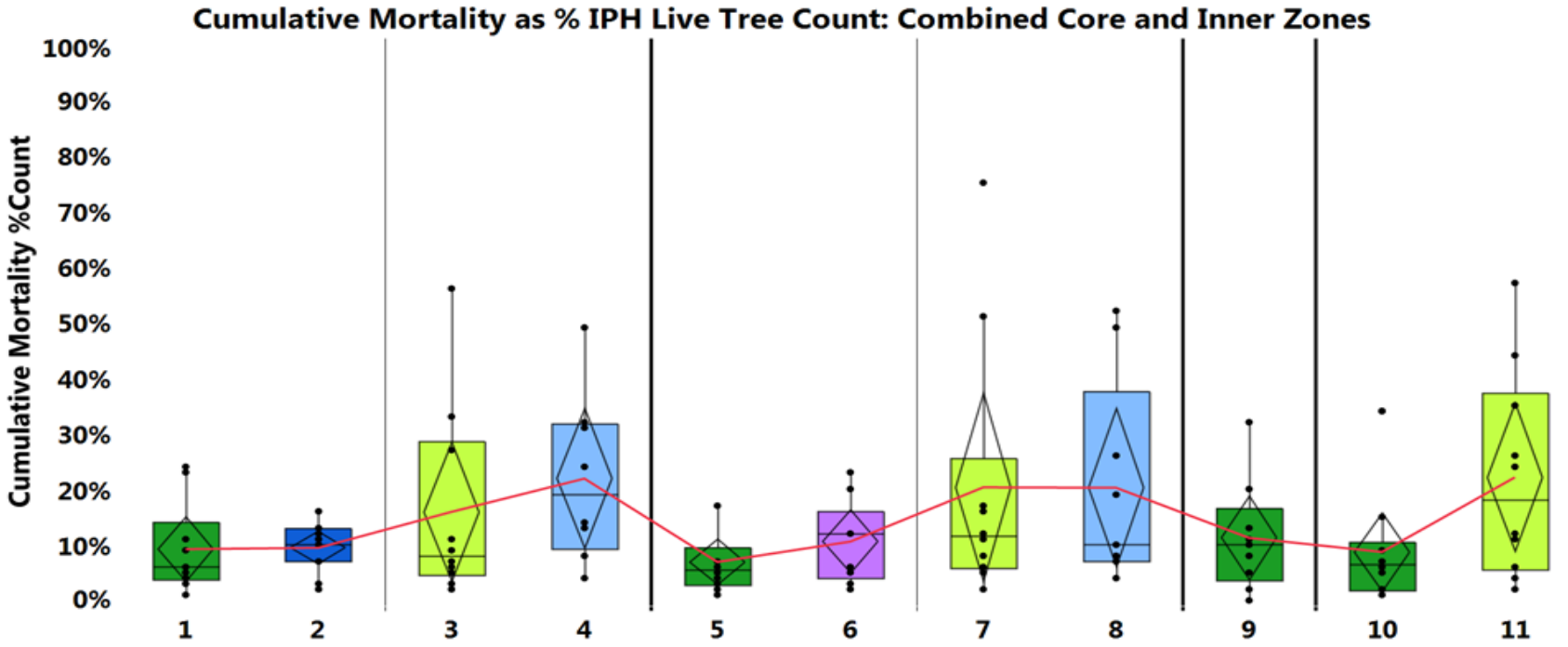
- Mortality greater on small streams
- 14 sites experienced high (>30%) mortality



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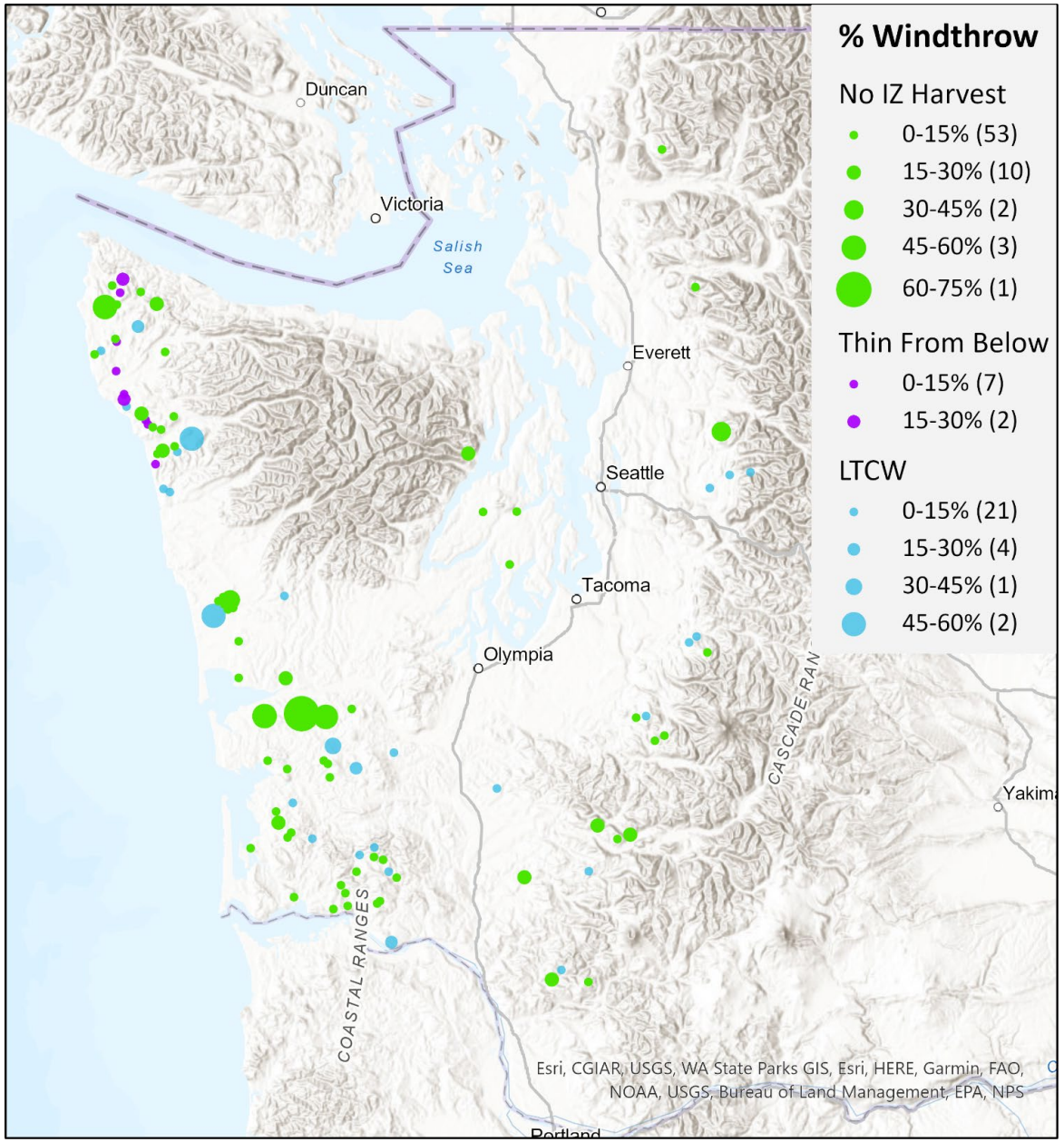
Width	L		S		L		S		L	L	S
IZ Harvest	No	LTCW	No	LTCW	No	TFB	No	LTCW	No	No	No
N	10	11	10	8	10	9	10	9	9	10	10

Windthrow Mortality

- Windthrow dominant agent on both large and small streams
    - 75% overall; median of 8.2% per site
- Buffers with thinned Inner Zone harvest (DFC Option 1) experienced less severe windthrow than those with LTCW (Option 2) or no-IZ harvest

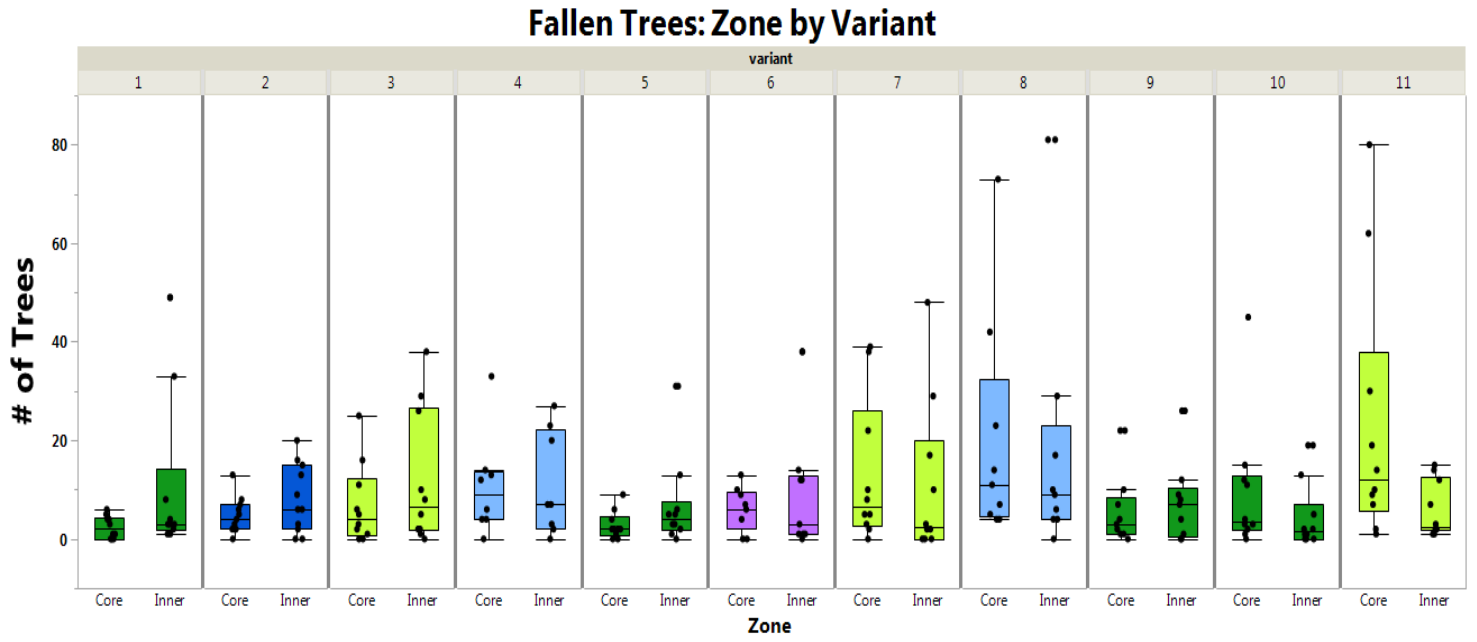
Windthrow Distribution and Factor Investigation

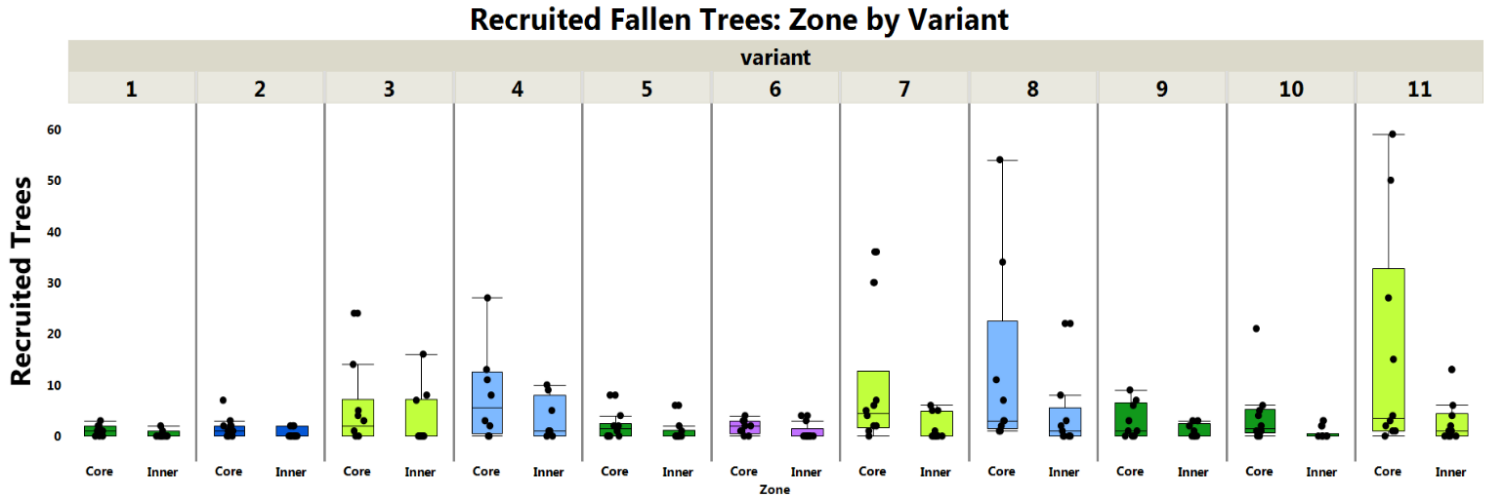
- Highest mortalities at low elevations in western coastal areas exposed to SW winds
- Factors that had the most relative influence:
  - exposure direction of the RMZ cutface (by far the most influential)
  - stream direction
  - elevation
  - channel width
- Younger stands tended to have more windthrow



Large Wood Recruitment

- Median of 25% of fallen trees reach stream
- Most recruitment is from Core Zone, even though …
- Most treefall occurs in Inner Zone





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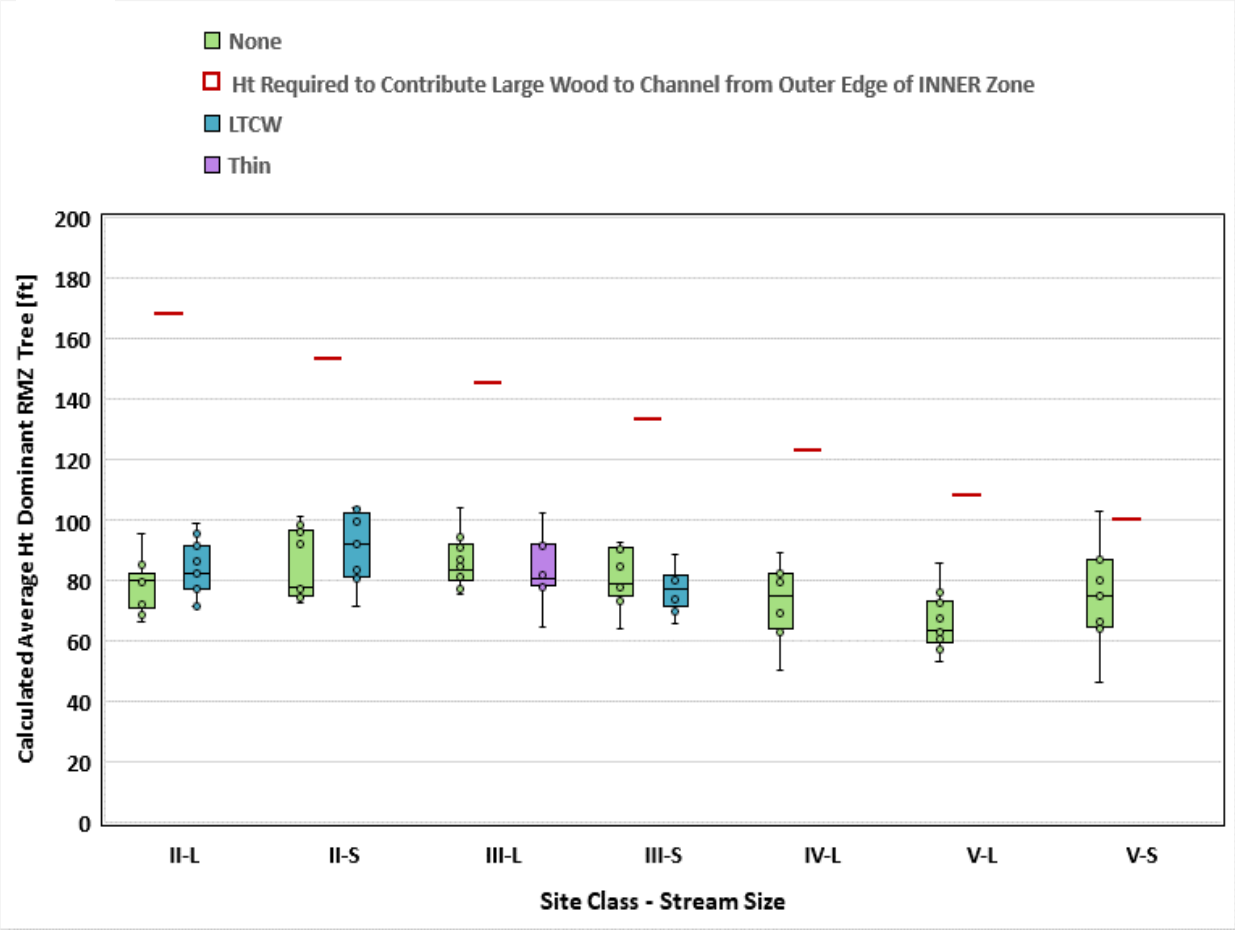
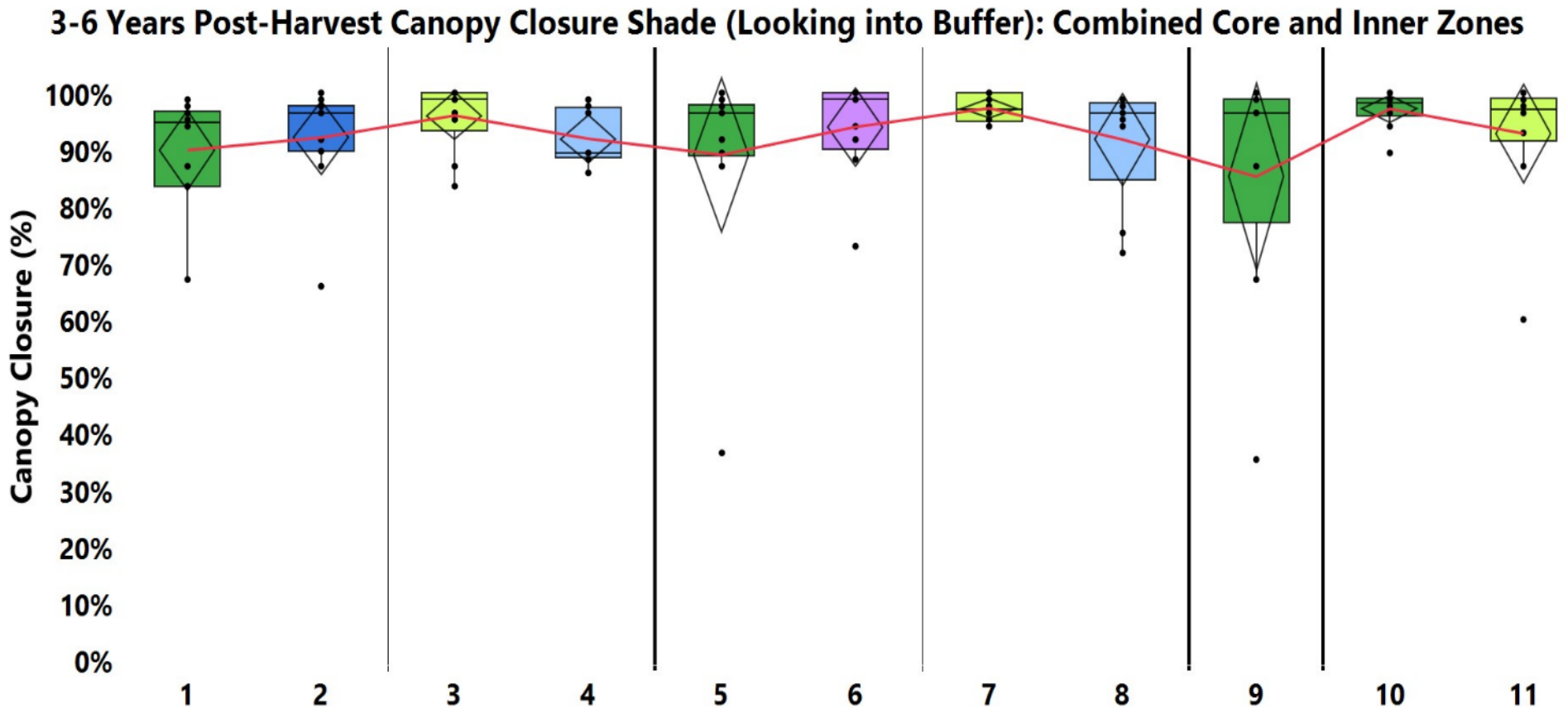


- Most trees in buffer Inner Zones not yet tall enough to reach channel as large pieces of wood

Shade (Canopy Closure)

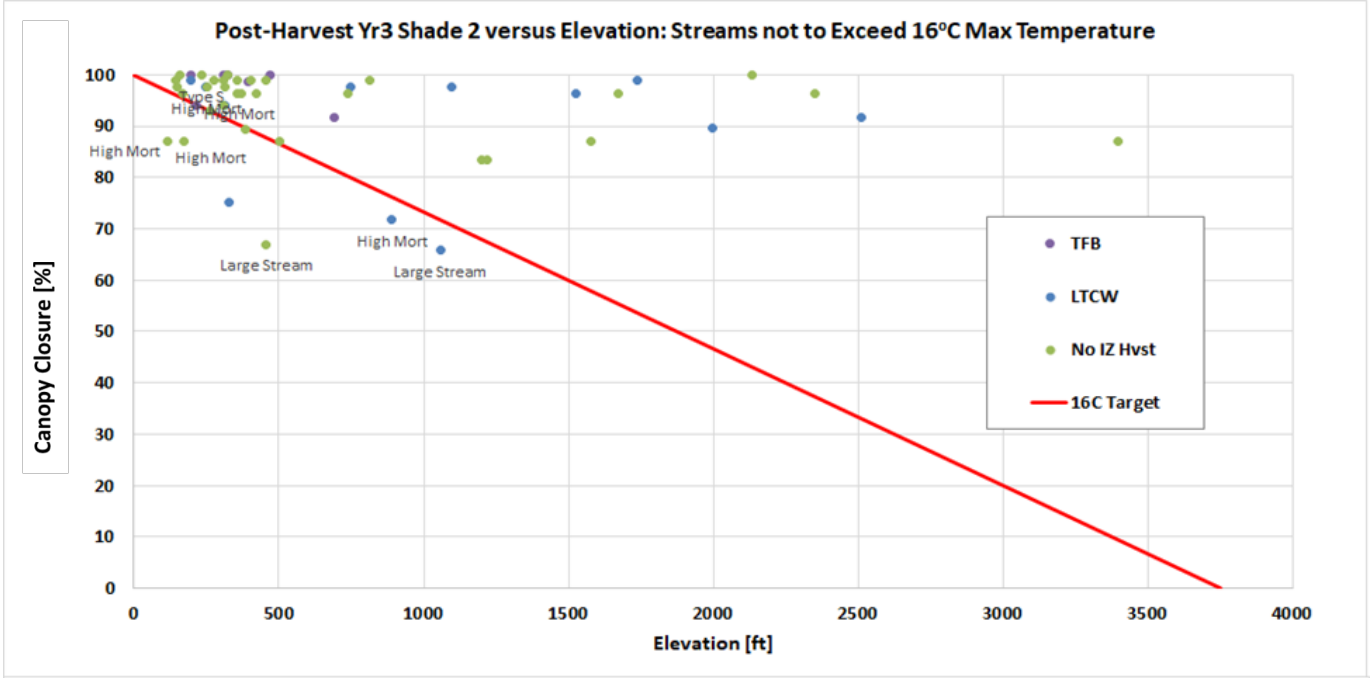


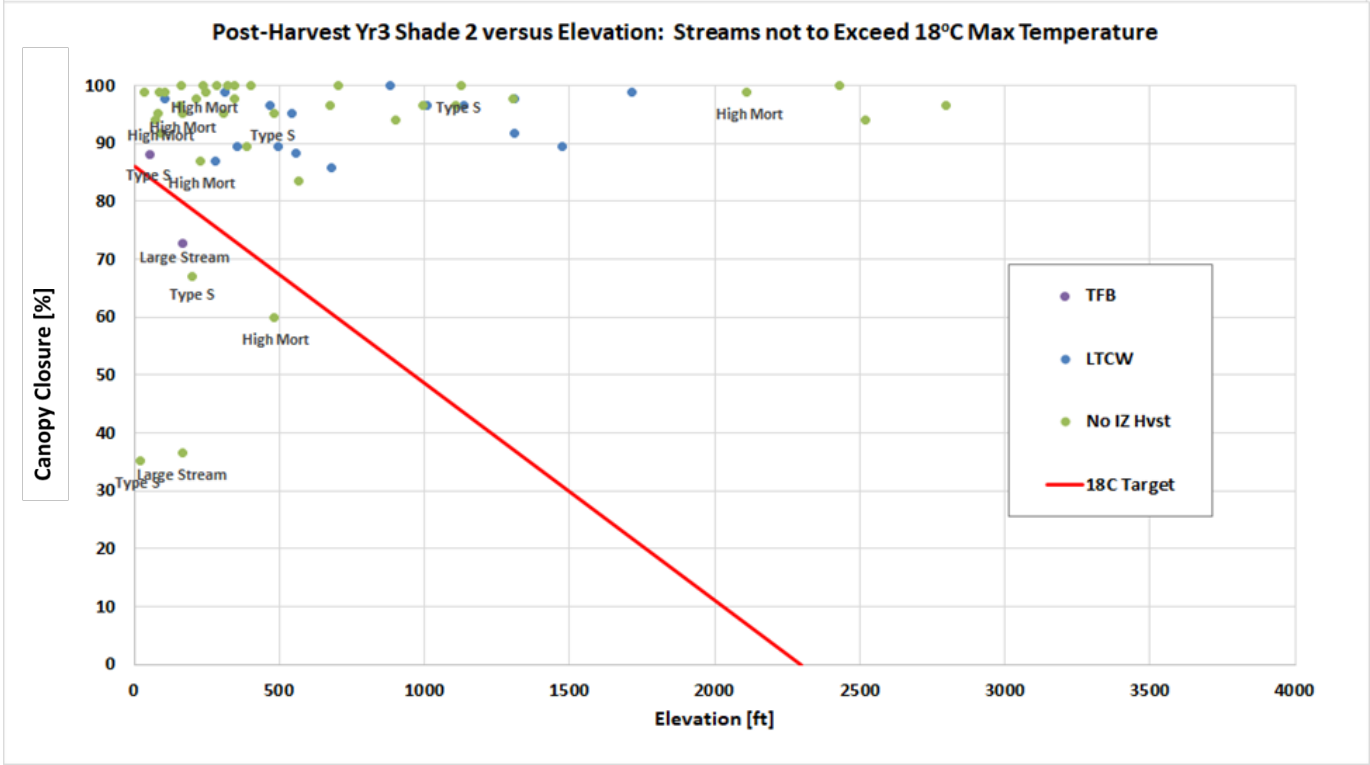
Site Class	II				III				IV	V	
Width	L		S		L		S		L	L	S
IZ Harvest	No	LTCW	No	LTCW	No	TFB	No	LTCW	No	No	No
N	10	11	10	8	10	9	10	9	9	10	10

Required Shade by Elevation and Water Quality*

- 90% meeting or exceeding nomograph targets
- 89% meeting L-1 minimum target of 85%

*FPB Manual Section 1





Erosion

- No measurable erosion related to the harvest or post-harvest mortality was observed

Conclusions

- High variability within all prescriptions
- None of the prescriptions stood out as providing substantially differing levels of riparian functions
- Canopy closure is high in all prescriptions
- All prescriptions leave large numbers of trees along stream to provide future wood recruitment
- Sediment input to streams is insubstantial on a chronic basis

Conclusions (cont'd)

- Windthrow is by far the dominant mortality agent
  - Occurs more frequently in buffers in coastal areas with S- to W-facing cut edges
- Despite post-harvest mortality, most stands are on trajectory to meet DFC target by age 140.

Conclusions (cont'd)

However …

- The Type F riparian stands tend to be young, dense, and dominated by relatively small conifer trees
  - Large proportion of fallen trees are currently too small to reach the channels to contribute key pieces of wood
  - The current age and state of the stands means it will take a long time for the trees at the outer edges of the RMZs to attain sizes needed to reach streams

Recommendations

- Invest our next research effort into testing riparian management strategies that could accelerate development of riparian forests with all the desired “future conditions”
  - Larger diameters and tall enough to reach channels
  - Multistoried stands composed of multiple species and variable light conditions
- Continue to monitor riparian stands from this study along with the extensive monitoring effort
  - If they appear to lose desired functions, we can revisit testing the effectiveness of some of the current prescriptions.

Questions?