Type N Water Buffers

Summary of Findings and Process

Forest Practices Board Meeting

November 09, 2022

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CMER Type N Studies

1. Buffer Integrity – Shade Effectiveness (Amphibian) - 2018
2. Westside Type N Buffer Characteristics, Integrity and Function (BCIF) - 2019
3. Extensive Riparian Status and Trends Temperature Monitoring – Type N/F (Westside and Eastside) -2019
4. Type N Experimental Buffer Treatment in Hard Rock Lithology – Phases I and II – 2018 and 2022
5. Type N Experimental Buffer Treatment in Soft Rock Lithologies - 2022

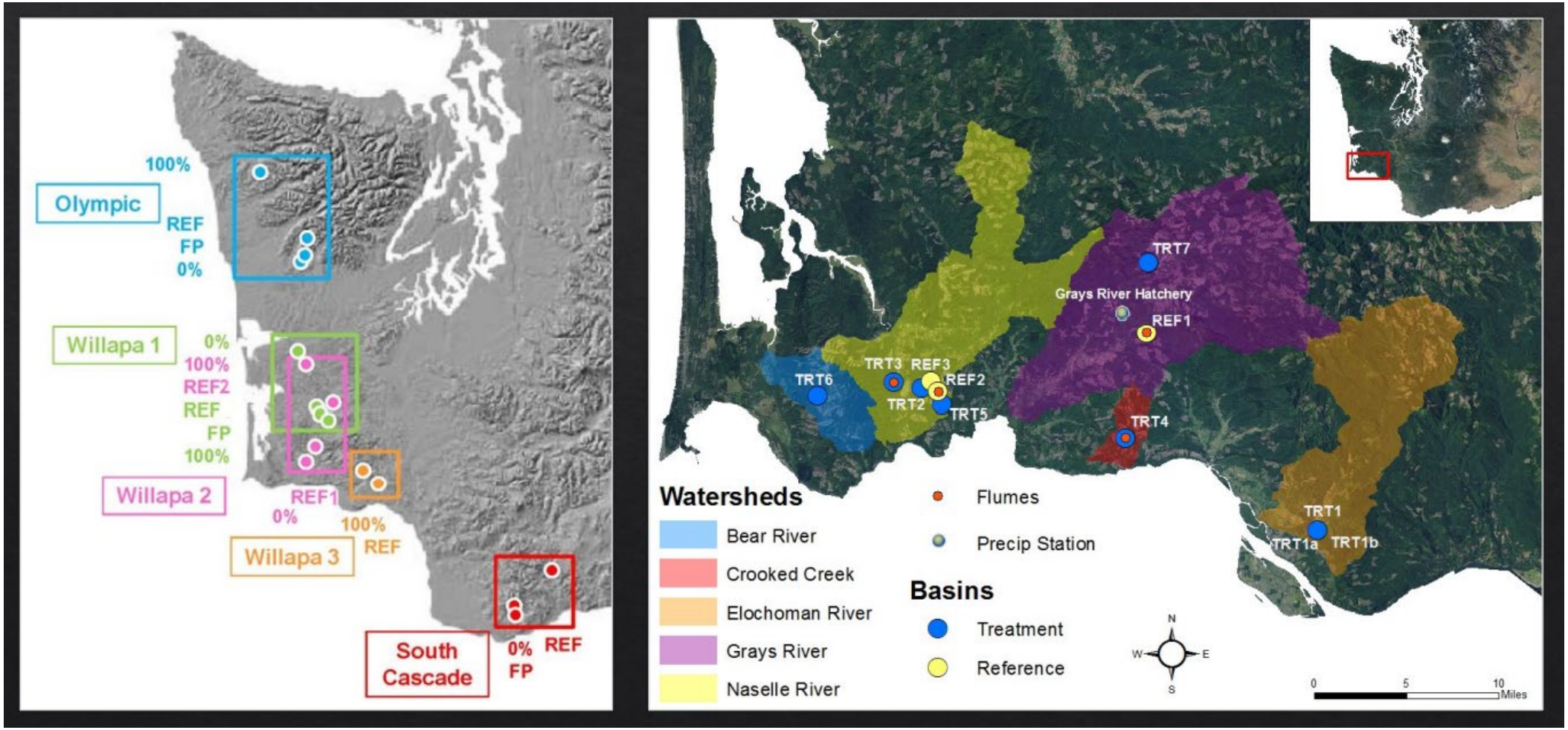
Summary of Rock Studies Findings

- Both studies evaluated the effectiveness of riparian buffer prescriptions on Type Np streams
- Hard rock tested effectiveness of current rules and of alternative buffers (100%, 0%, unharvested reference) in competent lithology
- Soft rock tested current rules on incompetent (erodible) lithology
- Hard rock study: pre-harvest monitoring (2006-2008) and post-harvest monitoring (2009-2019)
- Soft rock study: pre-harvest monitoring (2012-2013), post-harvest monitoring (2015-2019)

Summary of Rock Studies Findings

- Hard rock study had 13 study response variables including shade, water temperature and amphibian response
- Soft rock study had 09 study response variables including shade, water temperature and water temperature but not sediment delivery, organic input, channel structure, and amphibian response
- Site selection: followed a rigorous process including GIS screening, landowner information, and field verification. Once sites were selected, treatments were randomly assigned where possible
- Hard rock: five blocks and 17 treatment sites (ref = 6; 100% = 4; FP = 3; 0%=4)
- Soft rock: 10 treatment sites (FP = 7; REF = 3).

Summary of Rock Studies Findings



Summary of Rock Studies Findings (temp)

- Both studies were able to provide mean temperature changes due to treatments
- Studies provided two temperature response metrics: Maximum Monthly Temperature Response (MMTR) and Seven Day Temperature Response (7DTR). Both are measurements of predicted vs. observed difference
- 7DTR is the maximum value of 7-day average temperature response values in July and August and accounts for natural variability
- Both reports use 7DTR to represent the measurable change standard
- Studies have also reported highest annual seven-day average daily maximum temperatures (7DADM) and doesn’t account for natural variability

Summary of Rock Studies Findings (temp) Hard Rock:

- 7DTR increased in all buffer treatments:
  - 100%: initial increase of ~ 1C but returned to pre-harvest conditions within three years
  - FP treatment: initial increase of ~1C but remained elevated nine years post-harvest
  - 0% treatment: Initial increase of more than 3C with a steady return to pre-harvest conditions at post-10
- No FP treatment site exceeded 16 C 7DADM. Three sites in 0% and one site in 100% did exceed

	F/N break		
Year	**100%**	**FP**	**0%**
Post 1	**$1.2_{0\%}$**	**$1.1_{0\%}$**	**3.3**
Post 2	$0.6_{0\%}$	**$0.9_{0\%}$**	**2.7**
Post 3	0.6	$0.8_{0\%}$	**2.0**
Post 4	$0.6_{0\%}$	$0.5_{0\%}$	**1.9**
Post 5	$0.4_{0\%}$	$0.5_{0\%}$	**1.7**
Post 6	$0.4_{0\%}$	**0.9**	**1.3**
Post 7	**1.1**	**1.2**	**1.5**
Post 8	0.5_{FP}	**1.2**	**1.0**
Post 9	0.4	**0.8**	**0.9**
Post 10	0.1	0.2	0.6
Post 11	0.2	0.6	0.3

Summary of Rock Studies Findings (temp) Soft Rock

- 7DADM exceeded 16C at only one site. This site had the highest 7DADM pre-harvest and the lowest percent of buffer
- 7DTR was 0.3C or more through fourth year post-harvest
- Immediate temperature response was lower in the soft rock sites than in the hard rock FP treatment sites (0.6c vs 1.1c). Likely due to longer and wider buffers in the soft rock study
- Temperature returned to pre-harvest conditions sooner in the Soft Rock Study
- As with Hard Rock, shade was the main driver of temperature response

Summary of Np Workgroup Recommendations

- A Board approved Policy workgroup that included Policy members and subject matter experts
- Reviewed the results of both rock studies and a long list of available literature
- Recommended and encouraged Policy to consider the adoption of a combination of the following three alternatives which the workgroup evaluated for: stream temperature, economic impact and windthrow:

1. A continuous 75-foot buffer with managed outer 25 ft
2. A continuous buffer that varies from 25 – 75 ft based on stream orientation
3. A site-specific buffer that retains that portion of buffer that provides effective shade

Summary of Np Workgroup Recommendations

- Workgroup also reported uncertainties. Key points include:
- Harvest units rarely encompass entire watersheds, and streams and RMZs often form a harvest boundary. Experimental designs may create a study bias and that future examinations of more representative harvest layouts could reduce uncertainty
- Acknowledged that stream temperature increases are lower when more riparian vegetation is retained but that this pattern, across many studies, is noisy (isn't entirely clear). Responses are also variable because researchers use different temperature metrics
- Considered 7DTR as a reasonable measure of temperature response but didn't consider it as a direct assessment of the measurable change standard. Recommended: obtain larger samples, and evaluate sites that increased in temperature

Summary of Minority Recommendation

Prescription A: A 75-foot wide, two-sided, unmanaged continuous buffer when an Np basin greater than 30 acres is to be harvested 85% or more over a five year period

Prescription B:1,000 ft buffer: for all other circumstances:

- A 75 ft wide, two-sided, unmanaged buffer for the first 500 feet upstream of F/N break and a 50 ft wide, two-sided, unmanaged buffer for the next 500 ft
- Retain ELZ and sensitive site buffers
- Additional 50 ft buffers would be required if an operating area is 2,000 ft upstream of F/N break and Np stream length is more than 2, 000 ft and if 50% buffer objective is not met with ELZ, and sensitive site buffers.

Small Forest Landowner Option: same as prescription A and B above except the buffer configuration is 50-ft wide, two-sided buffer with the outer 25 ft manageable. Management in the outer 25 ft may remove half the available volume in a “think from above” approach.

Summary of Majority Recommendation

Option 1: A 75 ft, two-sided, no-harvest buffer on all Type Np streams for the first 600 ft upstream of F/N break or for the lowest 600 ft for isolated Np streams.

Upstream from the first 600 ft, bankful width (BFW) determines the width of a two-sided buffer:

- Two options for Np streams greater than 3 ft BFW:
  1. A two sided 75 ft buffer with the outer 25 ft manageable; or
  2. A 65 foot, two sided, fixed-width, no harvest buffer
- For Np streams less than 3 ft BFW, a two-sided 50 ft, fixed width, no harvest buffer
- All existing ELZ, sensitive site, hydraulic project, roads, yarding corridors and unstable slope rules will continue to be applied to the full length of the Np stream

Option 2: A 75-foot wide, two-sided, unmanaged continuous buffer when an Np basin greater than 30 acres is to be harvested 85% or more over a five year period

Board Action

- Majority and minority recommendations are caucus position papers when consensus can’t be reached in stage 2 of a dispute
- They are required by WAC 222-12-045(D)
- The program administrator delivered two sets of majority and minority recommendations to the Board
- Alternative development process at Policy has now concluded
- The rule also states that the Board will make the final determination regarding dispute resolution