

Unit A Riparian Retention Summary (Andrea Erwin, NRFT Instructor)

Project Summary and Results

INTRODUCTION: Since 2015, Andrea Erwin, an Instructor in the Natural Resources and Forest Technology Department at the College of New Caledonia has been conducting a multi-year (2015-2018) monitoring project on a small stream, located in the CNC Research Forest Unit A, situated north of Prince George, British Columbia. To further understand the valuable role of riparian forest habitat and the corresponding impacts of harvest on small streams, sampling stations were installed at four stream locations within Unit A: Unharvested Stream A (USA), Harvested Stream A (HSA), Harvested Stream B (HSB), and downstream of Bridge (DSB), where both the HSA and HSB flow into one. To quantify riparian and stream characteristics at each for the four stream sites, the following measurements were recorded, and corresponding results were obtained:

<i>Riparian Characteristics</i>	<i>Stream Characteristics</i>
Riparian Reserve Basal Area/Blowdown	Water Quality
Stream Shading	Stream Temperature
Riparian Vegetation % Cover	Instream Large Woody Debris
Streamside Relative Humidity/Temperature	
Riparian Vertical Temperature profiles	

RESULTS: Primary findings from the study include:

- Significant post-harvest blowdown in the riparian reserve was observed. Blowdown was highest at the HSA site (42%), 82.6% of which was subalpine fir and 17.4% of which was spruce. Mean basal area ranged from 20.84 to 39.77m²/ha; At the HSB site, blowdown was estimated at 36%, 68.9% of which was subalpine fir. Mean basal area was estimated at 55.66m²/ha
- Stream channel shading was affected post-harvest. Assessment of stream shading at 1.3m above stream surface was highest at the USA site (66-77%), where grasses/forbes (45%) and shrubs (48%) dominated the immediate area. Shade estimates at both the HSA and HSB sites were lower, with 37-46% and 54-63% obtained respectively. Grasses/forbes were dominant riparian vegetation at both sites (70%). No notable differences were detected among shade at the stream surface
- Relative humidity (RH) was affected post-harvest. RH values obtained in 2015-2016 were higher at the USA site, with lowest values obtained at the HSB site. In 2017-2018, RH values increased at the HSA site (highest). RH appears to significantly improve throughout the monitored years.
- No explicit trends were noted in vertical air temperature profiles. In 2015, high temperatures were noted at the HSA site (0.5m), while on average, stream temperatures taken at 2.5-4m at HSB were lower.
- Water quality measurements recorded indicate pH, conductivity and total dissolved solids (TDS) values were highest at the USA site in the spring of 2016 (pH=9.0), and summer of 2017 (conductivity=70µs/cm, TDS=44ppm). High pH values (9.2) were also noted at the DSB in spring of 2016
- Stream crossing deactivation may temporarily increase stream water temperature. Stream temperature data indicated high temperature fluctuation at the DSB site in 2015, where temperatures approached 20°C for 1-2 hours/day in mid July. Higher temperatures were also noted in early Aug 2016 at the HSB, exceeding 15°C. No data was obtained at HSA, HSB and DSB in 2017/2018 as streams were dry (June)
- High amounts of instream large woody debris (LWD) deposits (post-harvest) suspended above the channel, and high amounts of pre-harvest debris deposits at both the functional at high flow and functional at all flow areas was also noted at this site.



Reserve remaining at the Harvested Stream A (HSA) site in Research Forest Unit A (Erwin, 2016)