Testimony to Board of Forestry

June 3, 2015

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Dear Chair Imeson and Board Members:

My name is Jeff Light and I'm a Forest Hydrologist with Plum Creek Timber Company. I have a master's degree in Fisheries from the University of Washington, and an undergraduate degree in biology from the Univ. of Colorado. I've been involved in stream temperature research and monitoring for my entire 25-year career in forest management. I've worked in Maine, Montana, and throughout the Pacific Northwest. For many years I served as co-chair of the Ambient Monitoring Steering Committee in Washington's Cooperative Monitoring, Evaluation, and Research Program. I have served on the RipStream Advisory committee since near its inception. Plum Creek hosted several study sites.

Today I would like to present information that I believe is worth considering in your decisions regarding riparian rule changes. First, I would like to urge caution in relying on models to predict real-life outcomes in complex natural systems. Second I would like to challenge the notion that small tributaries exert significant influence on the temperatures of receiving waters.

I do this using field data from one of the RipStream study sites and an unmanaged watershed in the Alsea basin. For my first point, consider the information provided to you last June by the Dept. of Environmental Quality (Figure 1). This figures shows what the HeatSource temperature model predicts will happen when a medium fish stream (Jones Creek) is subjected to several clearcuts along its length. According to the model, the 7-day maximum temperature will warm more than a degree by the time it reaches its confluence with Drift Creek. To validate this, I placed temperature dataloggers at various points along the stream last summer. The actual temperature profile of that stream was nowhere near what was predicted (Figure 2). You can see that with a standard riparian buffer, no tributary inflow, and close to a half mile of southern exposure, the stream was the same temperature at its confluence (15.1°C) as it was in the control reach upstream of the RipStream study site (15.1°C). Granted this is only one site, but HeatSource is regarded as a pretty good physical temperature prediction model, so I think this illustrates that a lot of faith will be required if you expect the models to perform with sub-degree accuracy across the landscape.

My second point is illustrated at this same site and farther downstream where Drift Creek flows through several miles of wilderness. Notice in Figure 2 that despite being a full degree cooler than the Drift Creek mainstem, and contributing significant volume, Jones Creek only cools Drift Creek by 0.2°C. In the wilderness area, a large tributary (Boulder Creek) contributes approximately 10% of the mainstem flow

and was almost 5°C colder than Drift Creek in 2010, yet it produced no measurable change in the mainstem temperature immediately downstream (Figure 3). We've measured similar temperature effects of tributaries on the upper mainstem Siletz River. Of course, the influence of a tributary on a mainstem's temperature depends on the temperature of each and the relative flow volumes, and is best estimated with a mixing equation, but my point is simply that the influences can be much more subtle than you'd expect.

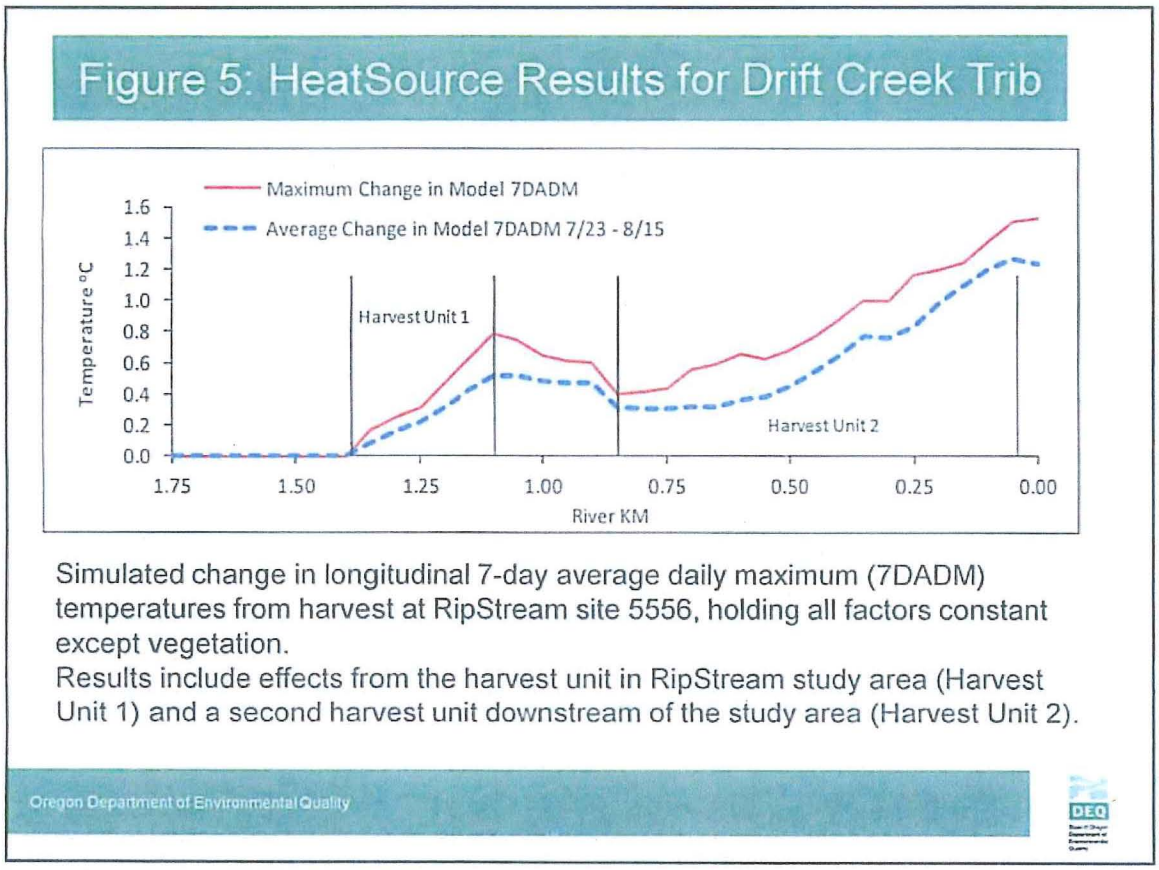

Figure 1. From DEQ presentation made at June 2014 Board of Forestry workshop.

The RipStream study quantified that a small amount of warming can be expected using current riparian rules. Even with this warming the streams remained, on the whole, plenty cold enough to protect beneficial uses. Biologically, the only concern would be if somehow these changes manifest as large downstream impacts. As our work in Drift Creek shows, modeling may not reflect what we actually see on the ground. My hope is that these real-life examples, further validated by the findings of the paired watershed studies, will inform your choice of prescriptions in response to RipStream.

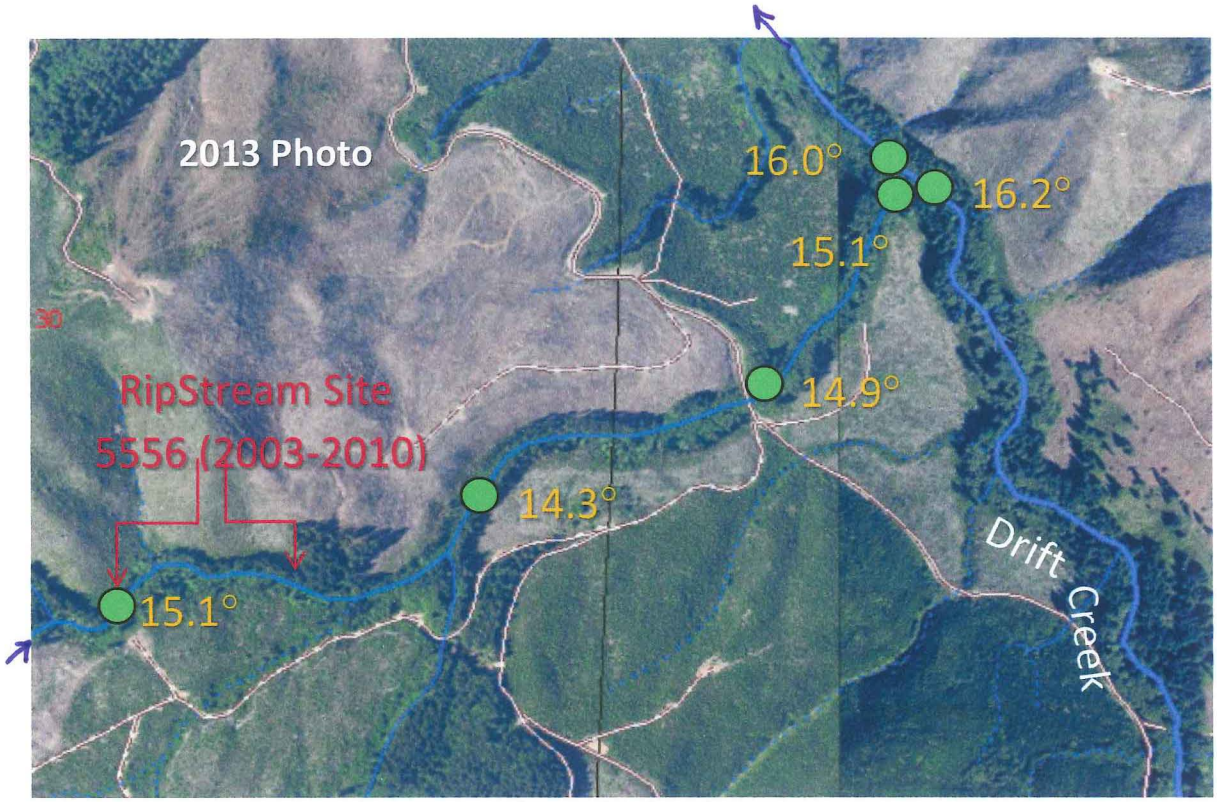

Figure 2. Jones Creek, Tributary to Drift Creek, Alsea basin RipStream Site 7-Day Maximum Temperatures from mid-July to mid-September, 2014

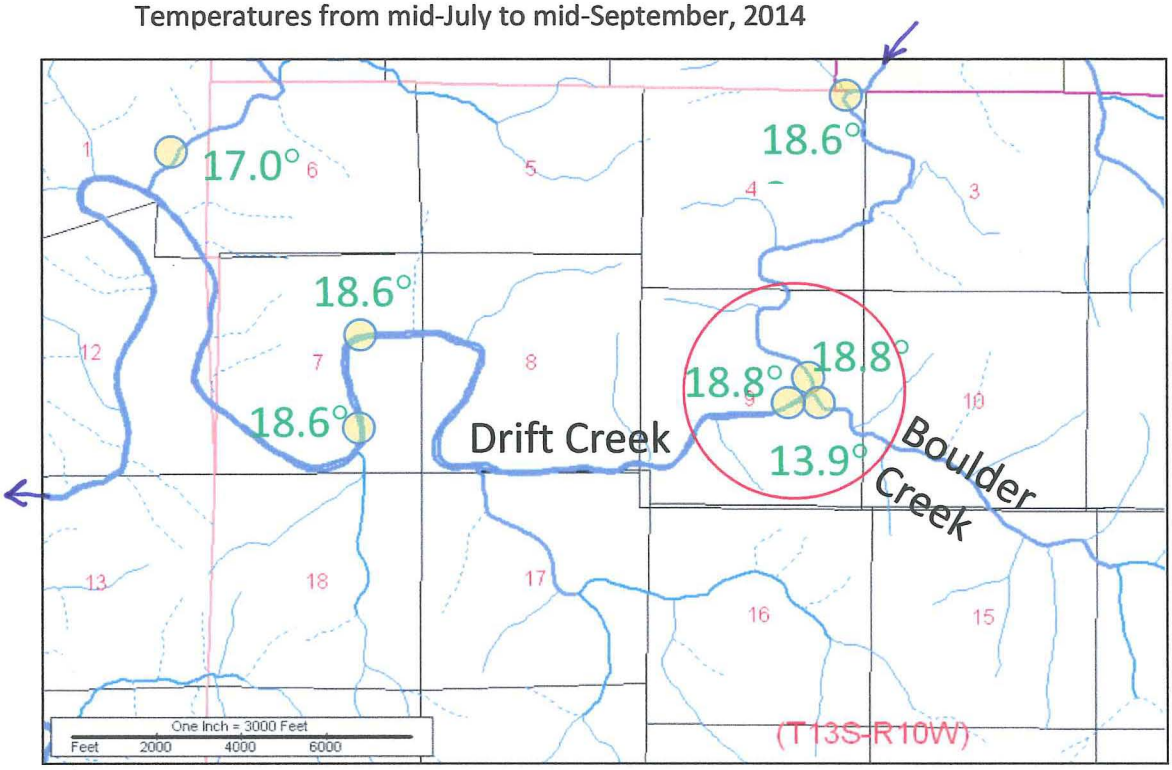

Figure 3. 7-day maximum stream temperatures in Drift Creek and tributaries as it flows through the Drift Creek Wilderness, summer 2010.