Oregon Stream Protection Coalition

M E M O R A N D U M

To: Oregon Board of Forestry
Fr: Mary Scurlock, Oregon Stream Protection Coalition
Re Follow-up to Climate Change Presentations as Context for Siskiyou Rules Review
Date: April 29, 2020

Thank you for the opportunity to provide follow-up testimony related to the implications of the April 22 presentations from experts Jessica Halofsky, Kara Anlauf-Dunn and Gordon Reeves on climate change and aquatic ecosystems in the Siskiyou georegion. The presentations and ensuing discussion were extremely informative, and I appreciated the chance to listen and follow along by phone.

There were a number of key takeaway messages that relate directly to the Board's July 22 decision as to whether small and medium fish streams are being degraded by logging-associated shade reduction allowed by current stream protection rules in the Siskiyou Region.

- *Best available data and analytical tools (NorWest) tell us that climate change is hitting southwest Oregon harder than other regions of western Oregon*, especially with regard to seasonal extremes, snowpack reduction, and an extended summer drought season. The clear implication for policy is that it is even more urgent to control management-induced warming in the Siskiyou and to mitigate climate impacts on coldwater aquatic biota.

- *Although the effects of local drivers on stream temperature vary from place to place, shading matters a great deal everywhere*, and in most cases is the most significant single influence on stream temperature. (Anlauf-Dunn, Reeves citing Wondzell, 2018). Local drivers include things like geology, valley shade, hyporheic exchange, channel curvature/sinuousity and wood loading.

- *Restoring riparian vegetative shade is so effective at protecting and restoring water temperatures that it is widely considered a key strategy for offsetting climate-induced temperature increases*. In many cases, reduced stream warming from restoration of natural riparian shade levels could more than offset summer warming anticipated from climate change.

- *Small and medium fish streams are particularly sensitive to warming caused by reduced shade*, and at the same time are vital in providing the cold water sources that support downstream coldwater refugia.

- *The efficacy of vegetative shading is largely determined by the width and composition of near-stream forests:* i.e. how far the forested buffers extend from the stream and the density, size and types of trees in these areas. No evidence has been presented that this physical relationship between riparian shade and stream temperature (established in the Department's published "Ripstream" research) is different in the Siskiyou than elsewhere in the western Oregon.

- *None of the three experts believes that riparian areas are at risk of providing "too much shade" to streams*. (Whether riparian stands are in an uncharacteristic condition with respect to fire risk and the implications of this for management is a separate question that was acknowledged but not answered).

- *The vegetative condition of upland areas is closely tied to maintenance of instream flows, which also help maintain cool water temperatures*. ODFW suggests the EPA's ecohydrology model -- Visualizing Ecosystems for Land Management Assessment or VELMA -- is a useful predictor of changes in low flows that affect streamflow, hence stream temperature response, under varying land management scenarios. Larger areas of mature forest condition are associated with higher summer streamflows and thus lower stream temperatures. This is consistent with growing evidence that the current practice of pervasive short-rotation clearcutting with some riparian retention leads to persistent low flows and accompanying habitat degradation, and that this overall effect is not limited to specific geographies. (Segura et. al., 2020).

Other takeaways not specific to stream temperature include:

Dr. Reeves raised questions about the Department's identification of fish streams. Stream classification is a critical determinant of the level of protection for water bodies under current rules. One of Dr. Reeves' slides noted a significant discrepancy between the miles of stream designated as fishbearing by ODF (199 miles) and those treated as such in Reeves' analysis (263 miles of habitat using 20% gradient cutoff) in an example watershed. We urge the Board to ensure that ODF and landowners are using best available information to identify the criteria that reasonably describe stream habitat accessible to fish so that the appropriate level of protection is fully and consistently applied. This issue seems particularly likely to come up with the smaller streams implicated in the Siskiyou review because they may include the headward extent of fish habitat.

The OFPA regulatory structure is not currently tailored to local variations. Current rules primarily vary stream protection requirements by the presence of fish habitat and stream size, though they do make a limited nod to the influence of debris-torrent-prone streams. How can/should our rules equitably recognize variation in: a) stream sensitivity to riparian shade, and b) other, localized drivers of stream temperature such as geomorphological characteristics? Are these kinds of factors more relevant in prioritizing restoration investments for management that is not required or incentivized through regulation, or can they be built into regulatory design?

References

Halofsky, J.E.; Peterson, D.L.; Gravenmier, R.A., eds. 201X. Climate change vulnerability and adaptation in southwest Oregon. Gen. Tech. Rep. PNW-GTR-xxx. Portland, OR: USDA Forest Service, Pacific Northwest Research Station. Xxx p. (in press report at www.adaptationpartners.or/swoap especially Isaak, DJ, B.B. Roper, G.H. Reeves, D. Horan. "Chapter 4: Effects of Climate change on Fish Species of Concern in Southwest Oregon.")

Oregon Board of Forestry Website, April 22, 2020 Meeting Materials: https://www.oregon.gov/odf/Board/Documents/BOF/20200422/B_Item Two_Presentation.pdf

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US Environmental Protection Agency. 2015. VELMA Eco-Hydrological Model, Version 2.0 (https://www.epa.gov/sites/production/files/2016-06/documents/velma_fact_sheet_8_4_15.pdf (2-page fact sheet)

Wondzell, S.M., M. Diabat, and R. Haggerty. 2019. "What Matters Most: Are Future Stream Temperatures More Sensitive to Changing Air Temperatures, Discharge, or Riparian Vegetation?" Journal of the American Water Resources Association 55 (1): 116–132. https://doi.org/10.1111/1752-1688.12707.\ (finding shade from riparian vegetation had the largest influence on stream temperatures in the Middle Fork John Day basin of Eastern Oregon based on HeatSource model simulations of future scenarios).