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December 5, 2023

### MEMORANDUM

**TO:** Council Members

**FROM:** Mark Fritsch

**SUBJECT:** Update on technical service contract Project #2017-002-00, *Analysis of Spatial Stream Networks for Salmonids*

### BACKGROUND:

**Presenter:** Jody Lando - *Research, Monitoring and Evaluation Lead for Bonneville Power Administration*; and  
Dan Isaak, *Research Fish Biologist for Rocky Mountain Research Station, U.S. Forest Service*

**Summary:** Dan will provide a summary of work completed under contract with Bonneville, associated with Project #2017-002-00, *Analysis of Spatial Stream Networks (SSN) for Salmonids ("FDAT")* a technical services contract<sup>1</sup> to develop linear networks for salmon densities using spatial statistics and GIS stream networks. This work was conducted by the US Forest Service Rocky Mountain Research division(s) NorthWest Stream Temperature (NorWeST) team with NOAA and Queensland University. The products from this exploratory effort intended to support tributary habitat restoration planning and support a proposed action commitment to monitoring temperature.

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<sup>1</sup> Technical service contracts (TSC) are categorized as Bonneville Program Support (i.e., provide expertise and/or capacity to Bonneville staff) – *A project that supports the (direct) Program but is not included in a Council recommendation or ISRP review.*

**Relevance:** This work was designed to test novel methods of incorporating fish distribution monitoring data into updated fish distribution maps.

**Workplan:** 2023 Fish and Wildlife Division Work Plan; Program Planning and Coordination.

**Background:** This effort was developed in three phases.

- **Phase 1, 2018:** Develop linear networks and related web-tools for modeling salmonid density (carrying capacity) and habitat relationships relative to temperature, flow, and other covariates using Spatial Stream Networks (SSN) models and the National Hydrography Dataset Network. Working with United States Forest Services Rocky Mountain Research Center in partnership with Queensland University of Technology and the NOAA-NMFS Alaska Fisheries Science Center, Bonneville explored opportunities to aggregate and format fish monitoring data in an efficient interface, with tools to inform tributary habitat prioritization efforts, life cycle models, and fish trends information limited to the Grande Ronde River.
- **Phase 2, 2019:** Support Phase 2 development of the Fish Data Analysis Tools (FDAT) linear networks for salmon and steelhead. This phase included an expanded geographic scope (John Day, Salmon and Clearwater basins) and ODFW and IDFG sources of data with the goal of improving estimate precision.
  - **NorWeST Phase 2: FY 2021-22:** BPA funded a NorWeST temperature dataset update along with USFWS cost share to ensure Bonneville funded M&E was added to a stream temperature network update. The work provided estimates of winter lows and updated the existing data set from 2013 to include more recent data.
- **Phase 3, 2022-23:** additional FDAT development for salmon and steelhead, using a proposed exchange standard to support NOAA's 2020 Biological Opinion terms and conditions to provide carrying capacity products to the Tributary Habitat Steering Committee to inform restoration planning and prioritization for Chinook salmon.

The result of this exploratory effort appears to be reliable and as such, could provide valuable data input to support tributary habitat restoration planning as well as a proposed action commitment to monitor stream temperature. For the future there may be opportunities to explore development of exchange processes to automate update of the FDAT and potentially coordinated with StreamNet. If this initiative is to be supported

through the direct fish and wildlife program, staff recommends prioritization, and a project review and recommendation, as typical for a project like this.

More Info:

- [NorWest Stream Temperature- Regional Database and Model](#): This website hosts a comprehensive interagency stream temperature database and high resolution climate scenarios for the Northwest U.S.