Northwest **Power** and **Conservation** Council

April 5, 2016

MEMORANDUM

TO: Council members

FROM: Jim Ruff – Manager, Mainstem Passage and River Operations

SUBJECT: Presentation on the rapid, range-wide inventory of aquatic species with environmental DNA sampling

BACKGROUND:

Presenter: Dr. Michael Young is a research fisheries biologist at the U.S. Forest Service Rocky Mountain Research Station -- National Genomics Center for Wildlife and Fish Conservation in Missoula, MT.

Summary: Many native aquatic taxa are of conservation concern. Those concerns are heightened by the potential for a changing climate to warm or alter the Northwest's streams and rivers, as well as by the arrival and spread of invasive non-native species. However, the assessment and monitoring of native and non-native aquatic species throughout the over 250,000 km of stream habitats in the Pacific Northwest region are daunting tasks. To fill the need for cost-effective, broad-scale, and reliable information on the distribution of aquatic species, scientists at the U.S. Forest Service Rocky Mountain Research Station have adopted and refined environmental DNA (eDNA) sampling. Some advantages of the eDNA sampling method is that it has better detection efficiency than electrofishing, it costs less, and takes less time; for example, one person can inventory an entire 6th-code watershed in one day.

851 S.W. Sixth Avenue, Suite 1100
Portland, Oregon 97204-1348
www.nwcouncil.org

Steve Crow
Executive Director

503-222-5161
800-452-5161
Fax: 503-820-2370

To demonstrate the efficacy of this approach, Rocky Mountain Research Station scientists have undertaken a range-wide, eDNA-based inventory of bull trout in the western U.S., to be completed by 2018. The bull trout is an ESA-listed species that relies on cold stream environments across the Northwest and is expected to decline with climate change. Resource managers from dozens of agencies are charged with maintaining bull trout in thousands of streams, but monitoring for this species is difficult. The first phases of the eDNA inventory have confirmed earlier descriptions of the distribution of bull trout, discovered new populations, delineated the distribution of suspected populations, and begun to elucidate how bull trout move within river basins to exploit thermal refugia. The U.S. Forest Service Rocky Mountain Research Station's experience with this and other eDNA-based projects suggests that this monitoring method has the promise to revolutionize aquatic species sampling.

Relevance: Several of the Council's emerging high priorities address "preserving program effectiveness by … taking into account the effects of climate change" and "aggressively addressing non-native and invasive species." (See p. 116 of the Council's 2014 Fish and Wildlife Program.) These high priority actions were recommended by numerous state, tribal and regional entities during the 2013-14 program amendment process and subsequently adopted by the Council into the program.

Work plan: This presentation addresses Council work plan item 2.B, which promotes regional fish and wildlife recovery by prioritizing and implementing 2014 Fish and Wildlife Program actions.

Background: The climate change sub-strategy in the Council's 2014 Fish and Wildlife Program calls on the federal action agencies, in coordination and collaboration with others, to "assess whether climate change effects are altering or are likely to alter critical river flows, water temperatures or other habitat attributes in a way that could significantly affect fish and wildlife important to the program." The program also identifies a need to "continue to encourage, monitor, and promote public awareness of pertinent climate change research and information and assess how it should influence program mitigation efforts."

An overarching principle in the non-native and invasive species sub-strategy states that "regional prevention and management efforts for non-native and invasive species should aim to: 1) detect the presence of these species early and respond rapidly; 2) educate the public; and 3) prevent, monitor, control, and stop or minimize the spread of non-native and invasive species where these [species] pose both a direct threat to the hydropower system, to native fish, or to wildlife species." Dr. Young's presentation will address aspects of both of these sub-strategies.

More Info: None.