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

February 7, 2017

MEMORANDUM

TO: **Fish and Wildlife Committee members**

FROM: **Patty O'Toole, Program Implementation Manager**

SUBJECT: **Update on the January Ocean Forum meeting**

BACKGROUND:

Presenter: Patty O'Toole

Summary: At the February Fish and Wildlife Committee meeting staff will provide a brief summary of the most recent Ocean and Plume Science and Management Forum (Ocean Forum) meeting. The Ocean Forum met on January 19th, 2017. The primary topic of this meeting was the *coupling between estuary and early ocean survival of salmonids – significance, mechanisms and opportunities*. The meeting had 36 attendees and met for about four hours.

The Ocean Forum members heard two presentations. The first by Brian Beckman (NWFSC – Seattle) focused on the ocean side of ocean-estuary coupling and how freshwater/estuary history affects ocean traits in salmonids. The second presentation by Laurie Weitkamp (NWFSC – Newport) discussed the Columbia River estuary half of the estuary-ocean coupling and this research is demonstrating that there is more going on in the estuary than previously thought.

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Relevance: The Ocean and Plume Science and Management Forum is a chartered Council forum which meets a few times each year to discuss ocean and estuary related research and its management implications.

Background: The following are a few highlights from the presentations:

- The weight of hatchery juvenile salmon and steelhead in the ocean varies more than 2-fold by stock. The size in the ocean is correlated to size at release. This indicates that management changes at hatcheries can have an influence on juvenile fish in the ocean.

- Salmon biomass (abundance x weight) varies by stock, month and year. In 2008 researchers observed very large biomass, in 2011, they observed pretty low biomass, reflecting the annual patterns in marine survival.

    - This information is helping researchers understand density dependence. In poor ocean conditions, they observe an increase in average fish size. While counter intuitive, this can be explained by the fact that in poor ocean conditions, overall mortality is higher, and this tends to affect small fish more, as they are more likely to be eaten. In this case, size and growth of survivors can be relatively strong. The opposite can also be true. In years of good ocean conditions, growth can be lower because more fish survive, including small and slow-growing fish. This increase in abundance can increase competition for food resources, further decreasing growth rates.

- The sample size of year old Chinook salmon in the ocean is correlated to adult returns. Ocean survival rates are generally set within two months of ocean entrance, though in some years this critical period can last much longer. In general, the first 2 months are pretty important.

- Based on observed patterns of juvenile salmon and steelhead downstream migration, hatchery and wild stocks overlap in the estuary and there is the potential for interactions between hatchery and wild fish.

- Downstream migration timing and ocean distribution varies by stock, and influences ocean growth potential.

- New research is showing that for interior spring Chinook salmon stocks, juvenile salmon are feeding and growing throughout their migration down the mainstem, through the estuary and into the ocean. This challenges the assumption that the estuary acts like a “pipe” transporting juvenile fish out to the ocean and that year old juvenile salmon don’t interact with the lower river and estuary environments.

More Info: See the Ocean Forum webpage.