**Johnson, Marc – Oregon Department of Fish and Wildlife**

**Presentation Title: Juvenile Physiology, Performance and Migration Behavior of Triploid Summer Steelhead**

Abstract for the 2018 Pacific Coast Steelhead Management Meeting

Marc A. Johnson, Thomas A. Friesen, Andrew H. Dittman, Paul M. Olmsted, David L. G. Noakes, Ryan B. Couture, Carl B. Schreck, Thomas P. Quinn

Ploidy manipulation can be used to sterilize and thereby genetically contain cultured fish that might otherwise interbreed with wild stocks. For salmonids, pressure-induced triploidy is sometimes used to sterilize resident trout species, but few studies have evaluated effects of triploidy on performance of free-ranging anadromous salmon and steelhead.  Limited data from past studies suggest low return rates of sterilized adult salmon and steelhead, though mechanisms are unclear.  Sterility may affect return rates through 1) failure to outmigrate as juveniles, 2) high mortality during or shortly after migration to saltwater, 3) failure to properly imprint upon and home to natal streams, 4) failure to manifest or respond to physiological cues that trigger adult spawning migration, or a combination of these.  To identify and better understand the relative effects of factors influencing triploid performance, we produced two cohorts of triploid summer steelhead at the South Santiam Hatchery, Oregon, and compared metrics of growth, survivorship, plasma thyroxine, gill ATPase, outmigration timing and success, and adult return rates to those of full-sibling diploid controls.  Overall, our results revealed slower growth, poor juvenile survival during transition to saltwater and significantly lower adult return rates by triploid steelhead, relative to diploid controls.  These factors represent real challenges toward the application of induced triploidy as a management tool for free-ranging salmon and steelhead, though focused research may illuminate paths toward successful implementation.