



March 2022

The following are just two of many examples of supporting scientific evidence to illustrate that hatchery presence on steelhead of natural origin has no negative effects on wild fish. The evidence clearly demonstrates that wild fish numbers do not increase when hatchery programs are removed.

As communicated by Garth Wyatt on Feb. 22, 2022  
Senior Scientist, PGE

We've got one of the best empirical datasets in the Columbia Basin and are happy to help. As an avid fisherman I hate giving up opportunities without an actual benefit to the wild population. The removal of summer steelhead in the upper Clackamas River to benefit the population of wild winter steelhead seemed like a slam dunk management action in the 1990's. However, as time and research have advanced, I've questioned whether the management action really achieved its original objective. Our research indicates that the presence of summer steelhead did not result in a decline of wild winter steelhead productivity relative to the other covariates in the analysis. Sometimes systems don't react the way you thought they would and repeating research is a good way of quantifying whether we're truly meeting the original intent of the management change. As a scientist who works for a utility, we have the luxury of not being bound by the same institutional bias that sometimes occurs in state agencies.

Given your initial email I thought a good starting point would be to forward the publication I coauthored with Ian Courter looking at wild winter steelhead productivity in response to the presence and removal of non-native Skamania stock summer steelhead. The paper is attached here but the cliff notes version is:

### **Background**

1. PGE funded and provided technical assistance on previous publications completed by ODFW (Kostow et al. 2003; Kostow and Zhou 2006) attributing the decline in wild winter steelhead productivity to the presence (competition) of non-native hatchery summer steelhead.
  - a. Utilized PGE's dataset (1958-2003)

### **Study Objective**

1. Determine whether the elimination of summer steelhead stocking in 1998 increased the productivity of wild winter steelhead in the Clackamas River upstream of North Fork Dam.

- a. Utilized PGE's dataset (1958-2017)
2. Document (in a peer-reviewed journal) wild winter steelhead productivity changes through time/management paradigms over the past 40 years.
  - a. Provides clarity around baseline condition prior to expected changes in productivity and abundance resulting from passage improvements
  - b. The model may be re-run in future years to detect the effect passage improvements have on winter steelhead productivity.
3. Corrects public record which relied upon PGE fish counts.
4. PGE is not advocating for hatchery fish management change in this publication.

### **Methods**

1. Sophisticated Bayesian state space model
  - a. Evaluated returns from 1958 – 2015
    - i. Low hatchery influence (1958 – 1970)
    - ii. High hatchery influence (1970 – 2001)
    - iii. Excluded hatchery fish (2002 – present)
  - b. Included Summer Steelhead returns, North Fork Spill index, and Ocean PDO as covariates
2. Correlated returns to neighboring reference populations (WF, Sandy, and Hood)

### **Findings**

1. Conclusions did not support the hypothesis that the presence of hatchery summer steelhead limited the productivity of wild winter steelhead. Contradicted Kostow and Zhou (2006).
2. Winter steelhead abundance failed to rebound after removal of the hatchery program
3. Environmental factors such as ocean conditions were the primary driver of wild winter steelhead productivity.
4. Spill at North Fork Dam was negatively correlated with wild winter steelhead productivity.
5. Positive correlations between Clackamas STW and Willamette and Sandy STW.

### **Key Differences from Kostow and Zhou (2006)**

1. Accounted for harvest of summer steelhead above North Fork.
2. More thoroughly examined effect of ocean conditions
3. Corrected data
4. More years of data
5. Examined each year discretely rather than clustering years into management periods (periods Kostow examined are characterized in methods above).-Perhaps the largest driving factor in difference in findings between Kostow and Zhou and our paper. Clustering years into

management periods that aligned with increases and decreases in ocean productivity confounded their results and I believe was one of the primary reasons our paper was ultimately selected for publication.

## Conclusions

1. Exclusion of summer steelhead did not improve winter steelhead productivity.
2. Apparent effect in earlier study was likely due to association between declining ocean conditions and introduction of hatchery fish into the basin (time/period effect).
3. Highlights need for studies that quantify the effects of hatchery fish on production of natural origin salmon.
4. Highlights need to empirically test theories about the mechanisms of hatchery fish impacts on natural origin fish.

This is just one facet of the hatchery/wild story here on the Clackamas. The history of spring Chinook in the basin is another interesting story. I'll be sending a follow-up email with information/timelines regarding hatchery fish management within the Clackamas that delves into the details.



### **Garth Wyatt**

Senior Scientist | 503-630-8231 | 541-991-6093  
portlandgeneral.com | Follow us on [Facebook \[facebook.com\]](#)

**An Oregon kind of energy.**

Garth

Excerpts as written by Carmen McDonald regarding the Clackamas River Dec. 31, 2012

## **Anti-Hatchery or Anti-Angler?**

by Carmen McDonald

...The Native Fish Society, as well as the McKenzie Flyfishers have either launched lawsuits or filed notice of intent to sue the Oregon Dept. of Fish and Wildlife over hatchery fish. Their beef? That hatchery fish are impeding the recovery of wild fish.

They cite studies authored by Katryn Kostow and many others that show suppression to productivity based on the mixed spawning of hatchery fish. In two such studies, one on the Clackamas and one on the Siletz, Kostow outlines "estimated carrying capacities" of wild fish in these rivers with the removal of hatchery fish. In these instances, the hatchery fish in question were removed, and now 15 or so years later, (it's currently 25 years) the wild fish have failed to respond. In each case, the reality of the wild population proves to be about half of Kostow's estimates.

Why are wild fish, steelhead in particular, not responding to the reduction and/or elimination of hatchery fish? Why are results similar to the Columbia not being seen after 15 years? (it's 25 years now)

On January 27, 2011, Katryn Kostow of ODFW delivered an update to her Clackamas River study and sent it out directly to wild fish groups. Within it, she cited a wild winter steelhead run numbering 3,100 adults as proof of the expansion of the population since the removal of hatchery summer steelhead. The only problem is, the wild fish numbering 3,100 did not exist. The actual number was 2,100, per PGE's direct fish count of wild fish ascending the dam. The actual run size of 2,100 and the 2010 run size are exactly similar to run sizes that existed when the hatchery summer steelhead were present.

Within Kostow's update, there was this gigantic out clause: The population appears to be able to grow again, which should increase the chance for recovery of this ESA-listed species. Two factors, population grow rate and basin carrying capacity, will determine how rapid the population abundance will increase and how big it can become. Recent modeling results (still in progress) suggest that population growth could take as long as 5 or 6 generations and will continue to be influenced by external factors that influence smolt-to-adult survival, ocean productivity cycles, and harvest rates.

In other words, there's a whole bunch of other factors that are much more important to wild fish survival than the presence of hatchery fish and Kostow has inserted her placeholder for the very real probability that no expansion of the wild run takes place.

At what point do we go back and test the hypothesis about wild and hatchery fish interactions on actual populations? We now have abundant case studies, yet the preservation groups ask for no validation.

Compiled by Leonard Krug  
President, Oregon Anglers Alliance