**Genetic analyses of *O.mykiss* in eastern Oregon**

Samples provided by Tim Porter (ODFW)(N = 93)

* Native redband from Paulina Creek (n = 35) sampled on July 2nd, 2019
* Unknown origin from SF Crooked River (n = 17) sampled on April 30th and October 10th, 2019 and October 7th and 8th, 2020
* Unknown origin from Twelvemile Creek (n = 41) sampled on July 3rd, 2019 and November 12th, 2019.

Genetic data provided by Justin Bohling (USFWS)

* Based on 379 genetic markers (Omy379), the samples sizes are
  + Cape Cod Hatchery n = 10
  + Crane Prairie Reservoir n = 1
  + Oak Springs Hatchery n = 10
  + Round Butte Hatchery n = 11
  + Wizard Fall Hatchery n = 11
* Based on 269 genetic markers (Omy269), the samples sizes are
  + Cape Cod Hatchery (stock 72H) n = 45
  + Crane Prairie Reservoir n = 0
  + Oak Springs Hatchery (stock 53H) n = 43
  + Round Butte Hatchery n = 0
  + Wizard Fall Hatchery (stock 127H) n = 34

Note: Stocks 72H and 53H are ODFW’s most commonly used stocks but ODFW has not used either stock in the South Fork Crooked. Tim nor I know why Justin provided this data.

Based on small sample sizes, best to use the 269 markers and associated sample sizes and not all 379 markers.

Paulina Creek N = 35

SF Crooked Unknowns N = 17

Twelvemile Unknowns N = 41

Wizard Falls Hatchery N = 34

We could include Oak Springs Hatchery 53H (N = 43) just to assess the degree of genetic differentiation among the other groups. But presumably, no fish would assign to this group.

Timeline for stocking in the SF Crooked

1. 1981: unknown, but presumably native fish
2. 1981: Rotenone
3. Since 1982, the SF Crooked River system has been stocked only with hatchery-raised summer steelhead Deschutes River stock 66H (which are produced at the Oak Springs Hatchery), fin-clipped redband trout stock 153H and possibly steelhead with origins from the upper Crooked River basin. Monitoring in the SF Crooked did not find any evidence of natural production. However, monitoring was not conducted in Twelvemile Creek.
4. In the early 2000’s ODFW started a program to produce a locally adapted stock by collecting gravid adult redband trout in the Ochoco National Forest from several different streams that were geographically close to each other. The main streams they collected wild adults from included Paulina Creek, Wolf Creek, and Sugar Creek. These adult fish were spawned in the Oak Springs Hatchery stock 153H, and then returned to their native stream. Fin-clipped 153H fingerlings were stocked in the SF Crooked from 2004-2009. The Cranebow stock 127H was used in 2010 and 2011. Due to successful natural production and good population dynamics, ODFW ceased stocking the SF after the 2011 release.
5. Stock 153H was not at Oak Springs for very long so USFWS probably never obtained any samples from them before they were discontinued. That was one reason ODFW collected samples from Paulina Creek for comparison to the unknown samples. ODFW assumes that the Paulina Creek samples would be very similar to any 153H fish if they were still present in the South Fork Crooked since that is one of the creeks were the broodstock was collected.
6. 2013: Dewatering, all fish presumed killed.
7. 2014-present : Since the locally adapted stock program (153H) had been discontinued, ODFW stocked with Cranebows (Wizard Falls Hatchery, Redband Trout stock 127H) to provide a fishery with a somewhat locally adapted stock that would survive the hot summers better than our typical hatchery stocks. Collecting native fish and stocking their progeny wasn’t very effective and it was extremely expensive. We weren’t going to go through that effort if there weren’t assurances that the dewatering wouldn’t happen again. Cranebows are hatchery fish derived from wild redband trout that were collected near Crane Prairie. The hatchery personnel create a common name in addition to the stock number that usually includes a geographical reference to their origin. For example, the Cape Cod, Roaring River and Eagle Lake stocks are other names of hatchery rainbows that ODFW stocks. Technically, they would be considered redbands, but there are most likely differences between Cranebows and Crooked River basin redbands, especially since the Cranebows have been in the hatchery system for a while.
8. According to ODFW records, stock 53H was never used in the SF Crooked.
9. In 2016, ODFW translocated 105 wild redband trout from Paulina Cr, Wolf Cr, and North Wolf Cr into the South Fork Crooked to see if natural production could be initiated.
10. The local BLM biologist said he saw trout in Twelvemile Creek that look like native redbands based on parr marks and fin quality. ODFW had not stocked Twelvemile Creek, so they decided to collect genetic samples from Twelvemile Creek and unmarked trout from SF Crooked to see if some native redbands survived the rotenone treatment and are repopulating or if they are just descendants of Cranebows from Wizard Falls Hatchery (stock 127H). It is possible that the fish could be descendents of the 153H stock. In this case, ODFW did not think it would be possible to differentiate them from other native redband stocks so they would consider them native redbands. The samples being either true native redband or descendants of 153H stocked fish would be the desired outcome as they would have locally adapted genetics.