



Status and Trend of Okanogan summer/fall Chinook

Chief Joseph Hatchery
2016 Annual Program Review

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KMQ 1: What is the current status and recent historical trend of the naturally-spawning population in terms of Viable Salmonid Population (VSP) parameters?

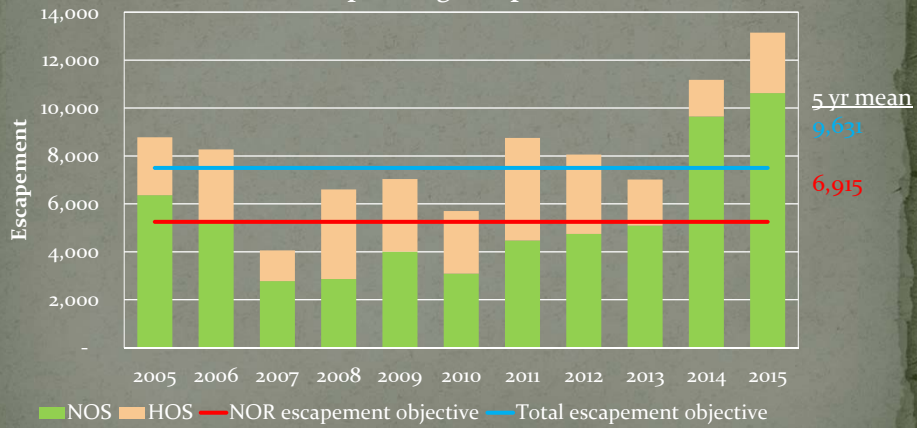
Viable Salmonid Population (VSP)

Introduced via NOAA tech memo (McElhane et al. 2000) for ESA recovery planning

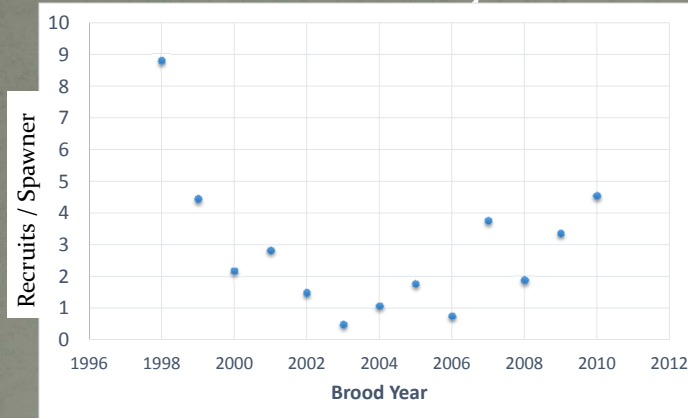
- A VSP is independent of other populations
(distance, genetics, stray rates, size)
- Negligible risk of extinction
(less than 5% over 100 yr timeframe)
- Abundance, Productivity, Spatial Structure, Diversity

Abundance

Natural Spawning Escapement



Productivity

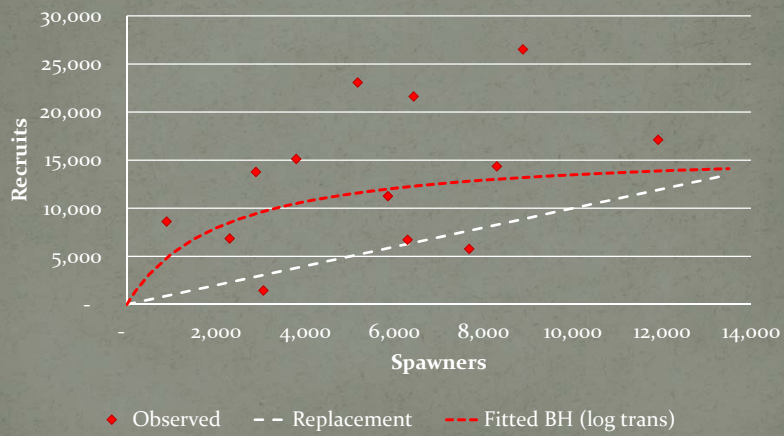


Overall Mean (1998-2010) = 3.0 R/S
 10 Yr Mean (2001-2010) = 2.2 R/S
 2 of 13 years < 1 R/S

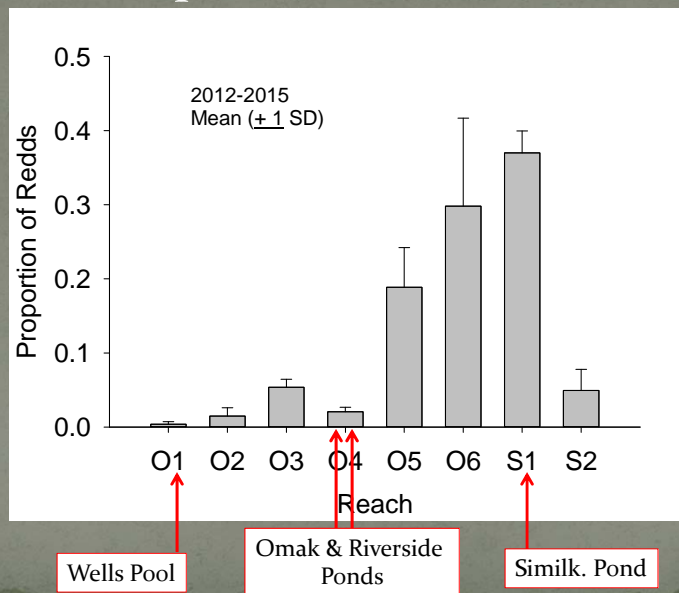
Intrinsic Productivity

(Beverton-Holt modeled = 7.8)

BY1998-2010



Spatial Structure



Diversity

1. Genetic
2. Phenotypic (morphology and life history traits)
3. Risk factors (spawner composition; pHOS & PNI)

Genetic Structure of upper Columbia River Summer Chinook and Evaluation of the Effects of Supplementation Programs

MONITORING AND EVALUATION OF THE CHELAN AND GRANT COUNTY PUDs HATCHERY PROGRAMS

2014 ANNUAL REPORT

June 1, 2015



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Genetic Structure of upper Columbia River Summer Chinook and
Evaluation of the Effects of Supplementation Programs

Appendix M

Genetic Diversity of Upper Columbia River Summer Chinook
Salmon

by

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February 2011

Objective: (Kassler et al. 2011)

- The objectives of this study were to determine if genetic diversity, population structure, and effective population size have changed in natural spawning populations as a result of the hatchery programs.

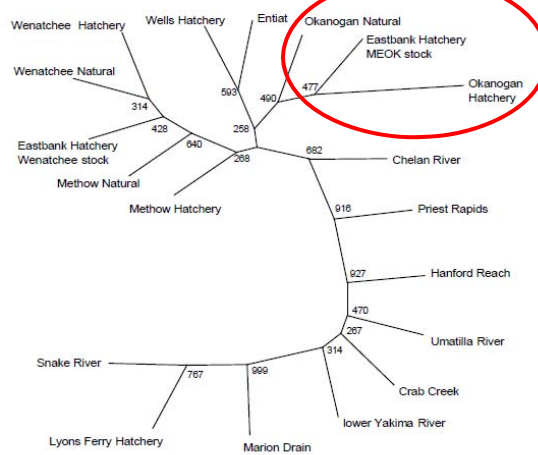
Kassler et al. 2011

- Looked at H and W groups from...
 - Okanogan
 - Methow
 - Chelan Falls
 - Entiat
 - Wenatchee
 - Hanford Reach....and beyond
- Compared pre-supplementation (1993) to post-supplementation (2008)

Results: (Kassler et al. 2011) paraphrased...

- post supplementation = pre-supplementation
- the populations have been homogenized
- slight differentiation consistent with geographic separation

Results: (Kassler et al. 2011)



Diversity: Moving Forward

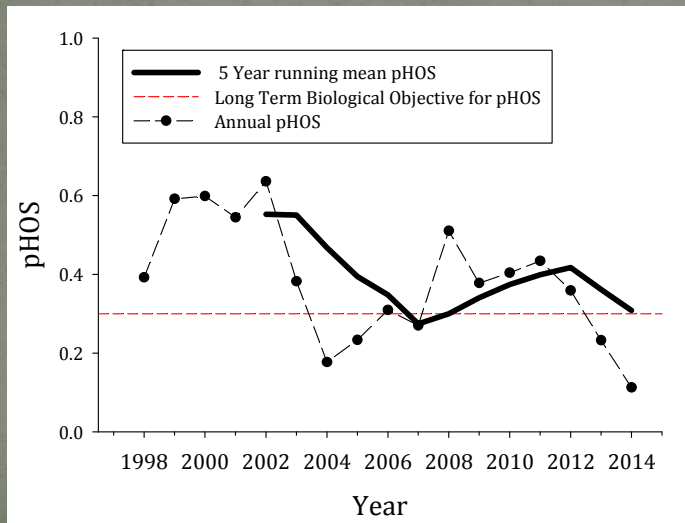
- Broodstock collection protocols under the new CJH program (2010) should improve genetic differentiation.
- Selective harvest and lower pHOS will reduce the number of non-target (stray) hatchery fish on the Okanogan spawning grounds.
- It will take ? salmon generations under the new program to see further genetic differentiation.
- PUD M&E program has a 10 yr recurrence interval for genetic evaluation.
 - 2018 will be too soon to detect changes from CJH improvements
 - 2028 (2 full brood cycles of adult to adult returns)

Diversity

2. Phenotypic (morphology and life history traits).
 - Adult run timing (2017; 4 yr olds)
 - Spawn timing (2018; 4&5 yr olds)
 - Age structure (2019; through age 6)
 - Morphometrics (length, fecundity, others)
 - Juvenile rearing strategies
 - Natural yearlings?
 - Transient rearing
 - True subyearling migrants

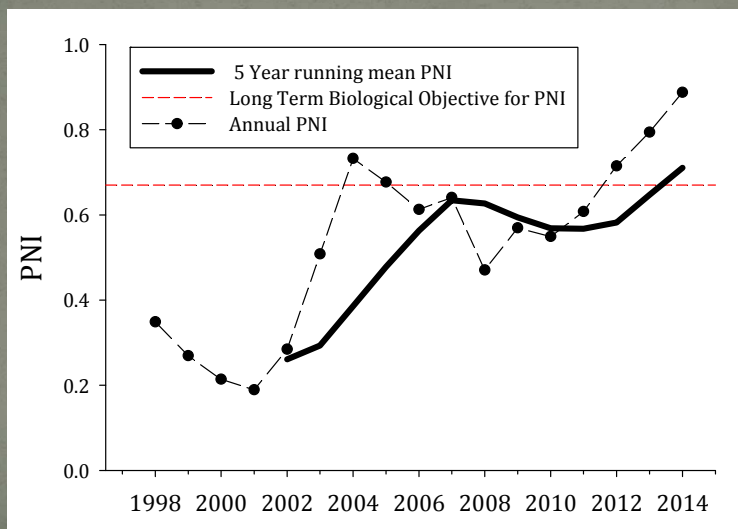
Diversity

3. Risk factors (spawner composition; pHOS & PNI)



Diversity

• Risk factors (spawner composition; pHOS & PNI)



Conclusions:

- Abundance is strong and increasing
- Productivity is higher than previous assumptions
- Spatial Structure: we have the baseline, now wait and see
- Diversity: We have a baseline, and we have metrics to monitor (phenotypic and pHOS, PNI) while we wait for the next genetic evaluations (2018, 2028)