YKFP Spring Chinook Supplementation Assessment

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Quantitative Objectives of the YKFP

- Increase harvest opportunities.
- Minimize genetic impacts to unsupplemented streams.
- Keep impacts to non-target taxa within containment objectives.
- Protect productive habitat and increase freshwater productivity/capacity of Basin.
- Disseminate important scientific findings.
- Increase natural production of target species while maintaining long-term fitness.

Harvest

- Tribal subsistence fisheries in the Yakima Basin have occurred in all years of the Program (1,262/yr).
- Sport fisheries in the Yakima Basin have occurred in 8 of the 12 years of HO returns (1,048/yr).
- Contributes to Columbia River Tribal, sport, and commercial fisheries (2,287/yr).

Minimize Genetic Impacts

- Out of Basin spawning ground recoveries have been minimal.
  - 8 Out-of Basin carcass recoveries
  - 9 Naches River, WA

Non-Target Taxa

- Robust monitoring program for non-target taxa of concern.
- See Gabe Temple's talk tomorrow.

Habitat

- Habitat protection, restoration, and tributary passage efforts are ongoing.
- Many miles of habitat have been purchased, protected, and restored and new tributary habitat has been re-opened to anadromous fish.

Disseminate Data

- Many reports and publications have been produced by the YKFP.
- Many of the presentations today and tomorrow are YKFP efforts.

See www.ykfp.org or www.efw.bpa.gov for reports

Natural Production and Fitness

- Spring Chinook talks today cover some of the mechanisms that drive production and fitness.

Indicators of Supplementation Success

- Total spawner abundance of the supplemented population should increase.
- Natural origin spawner abundance should increase.
- Productivity of supplemented population should remain the same or increase.

Based on Monitoring and Evaluation of Supplementation Projects (ISRP & ISAB, 2005)

Objectives

- Estimate spawning escapement, proportion hatchery fish, and age composition of spring Chinook that spawned in the upper Yakima River and Naches subbasins
- Identify suitable reference streams by comparing productivity and abundance before the onset of supplementation (pre 2001).
- Use a BACI to test the deltas (T-R) in the pre and post supplementation years.

Spawning escapement

- YN conducts weekly census of redds from all available spawning habitat in both upper Yakima and Naches
- Use carcass recoveries adjusted for recovery probability bias based on Murdoch et al. (2010) to estimate sex ratio of the spawning population (i.e., fish per redd)
- Expanded total redds count by fish per redd to estimate spawning population.
- So why not just use Roza data?

Proportion of HO Spawners

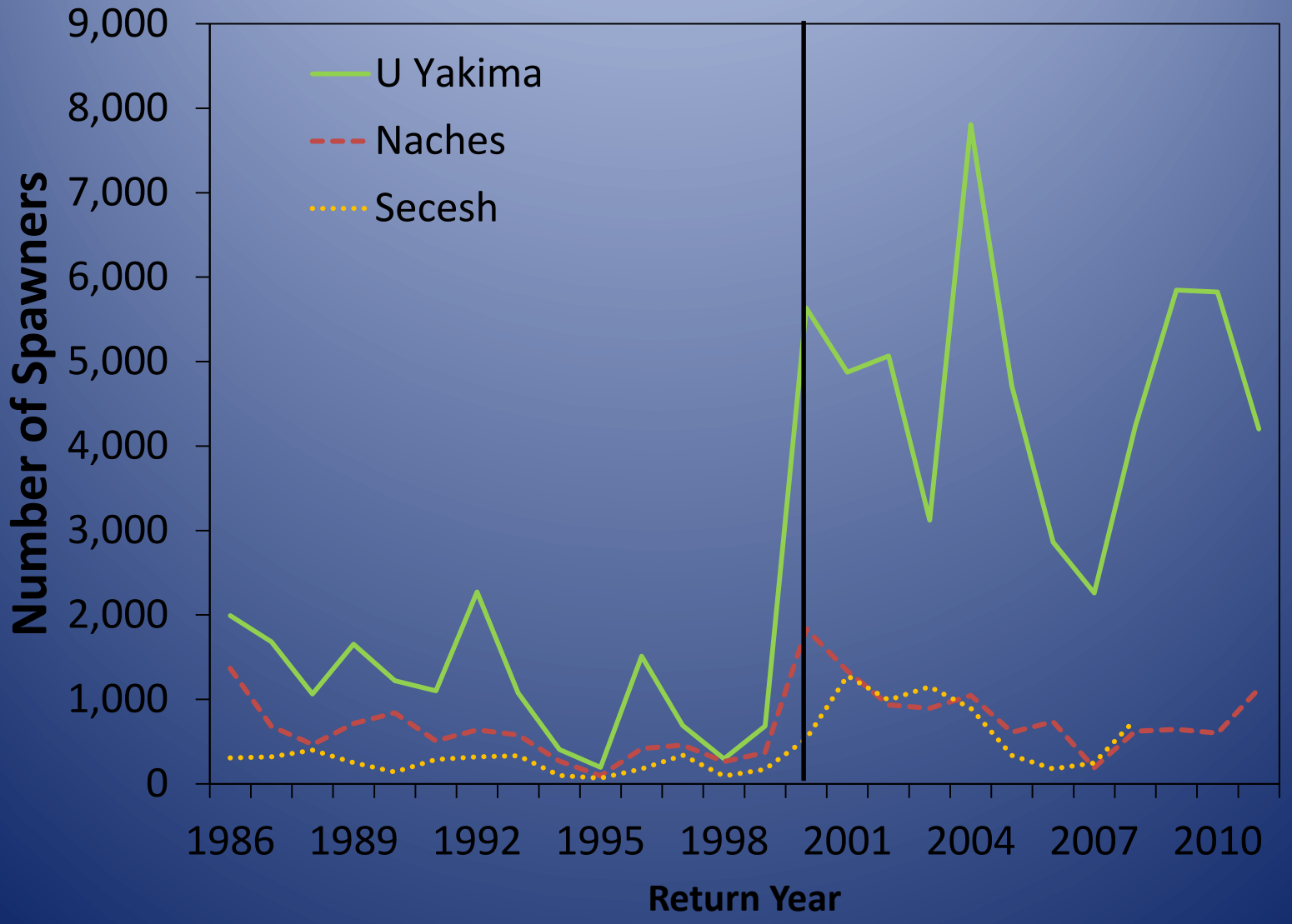
Spawner Estimates

Potential Reference Populations

Natural origin abundance (spawners)

Population	Correlation coefficient (*r*)	*P*
Bear Valley Creek	0.043	0.312
Chamberlain Creek	0.388	0.171
E.F. Salmon River	0.082	0.779
Lemhi River	0.361	0.205
Marsh Creek	0.280	0.332
Naches River	**0.756**	**0.002**
Secesh River	**0.583**	**0.029**
Sulpher Creek	0.291	0.673

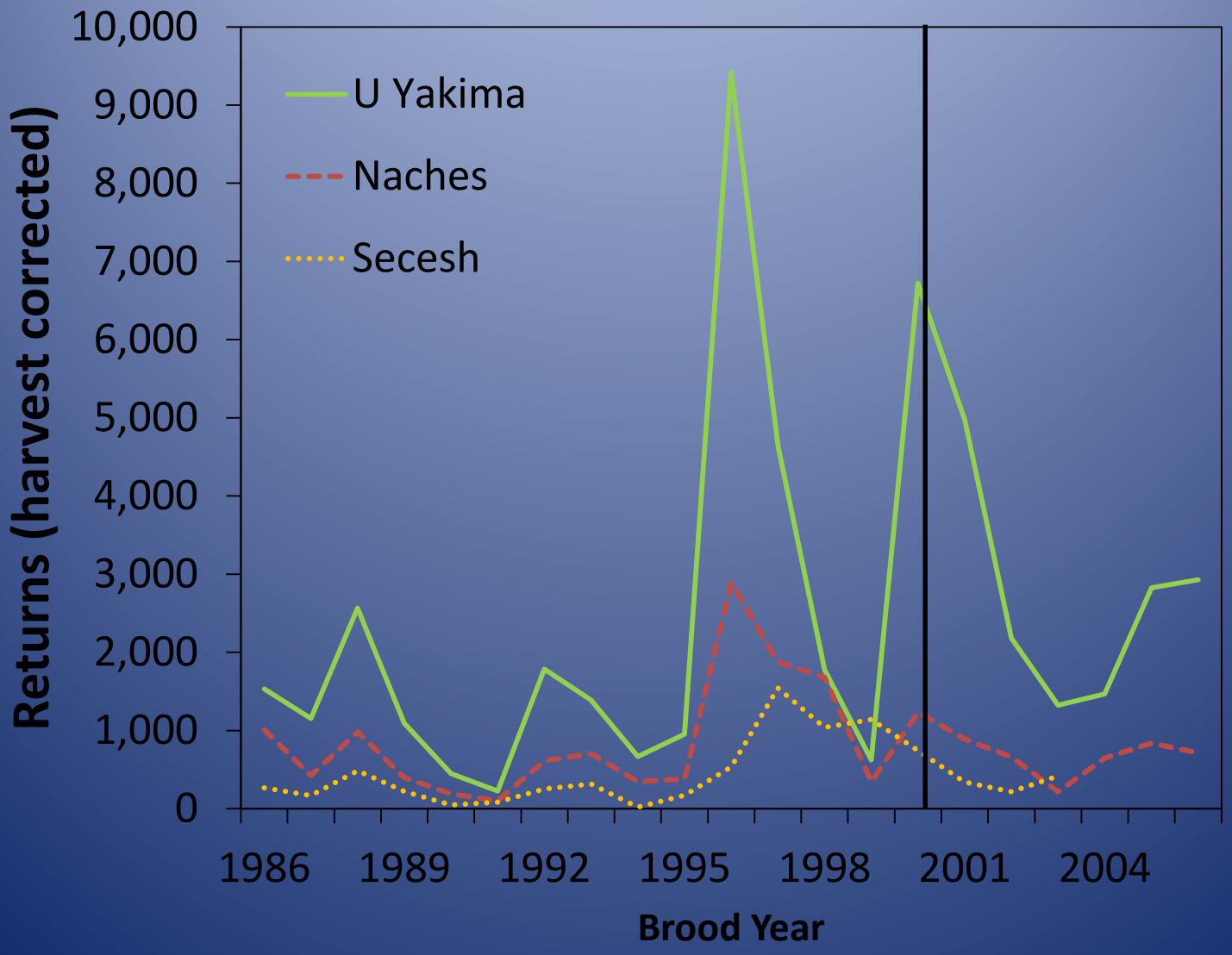
Total Spawner Abundance



Total Spawner Abundance BACI Results

Population	Origin	Pre Supp T-C	Post Supp T-C	Post-Pre	*P*
Naches River	All	583	3822	3239	<0.001
Secesh River	All	896	3800	2904	<0.001

Natural Origin Recruits



Natural Origin Recruits
BACI Results

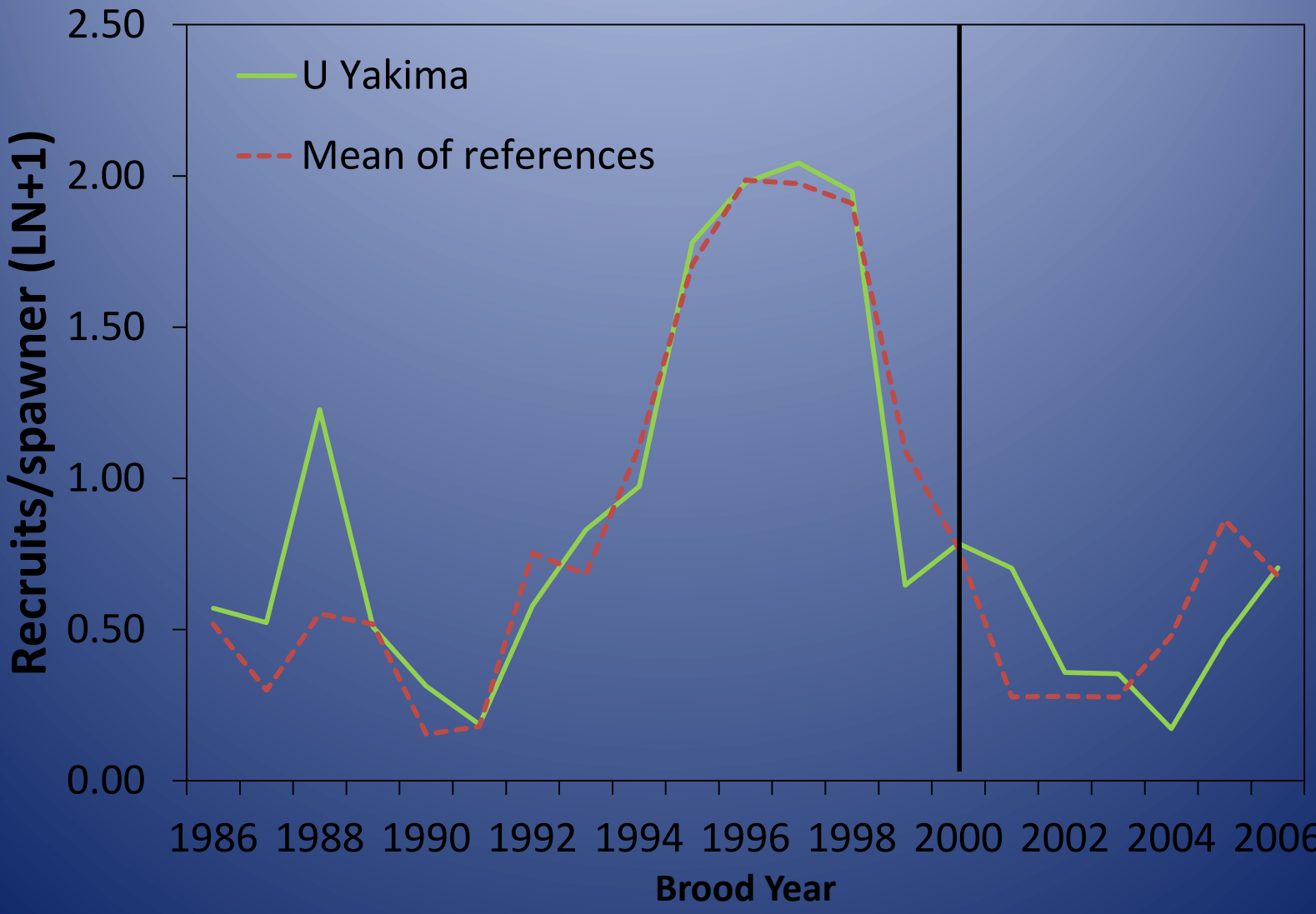
Population	Origin	Pre Supp T-C	Post Supp T-C	Post-Pre	*P*
Naches River	NO	1166	2460	1294	0.058
Secesh River	NO	1570	3369	1799	0.092

Potential Reference Populations

Recruits/spawner (productivity)

Population	Correlation coefficient (*r*)	*P*
Bear Valley Creek	**0.947**	**<0.001**
Chamberlain Creek	0.528	0.052
E.F. Salmon River	**0.757**	**0.001**
Lemhi River	**0.596**	**0.025**
Marsh Creek	**0.855**	**<0.001**
Naches River	**0.947**	**<0.001**
Secesh River	**0.607**	**0.021**
Sulpher Creek	0.476	0.085

Productivity (recruits/spawner)



Productivity (recruits/spawner) BACI Results

Population	Pre Supp T-C	Post Supp T-C	Post-Pre	*P*
Bear Valley Creek	0.038	0.156	0.118	0.222
E.F. Salmon River	-0.225	0.010	0.235	0.281
Lemhi River	0.012	0.283	0.271	0.205
Marsh Creek	0.351	0.197	-0.154	0.267
Naches River	0.061	-0.036	-0.097	0.132
Secesh River	0.053	0.146	0.093	0.373

Future

- Still need to correct for density – supplemented (or unsupplemented) streams may be above capacity, potentially decreasing freshwater productivity.
- Several good reference populations for productivity, but must continue examining other populations or develop other metrics for abundance.
- Few years of data during the treatment period. Likely need many more to make firm conclusions.
- YKFP will be working with other researchers in the Upper Columbia and lower Snake to refine methodology to assess supplementation programs

Acknowledgements

- All carcass and redd surveys in the Yakima and Naches are performed by YN Fisheries personnel.
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