



Hot Summer Temperatures Have Unique Impacts to Dworshak Fish Hatchery NWFFC December 1-3, 2015 Mark Drobish, Chris Peery, Kent Hills

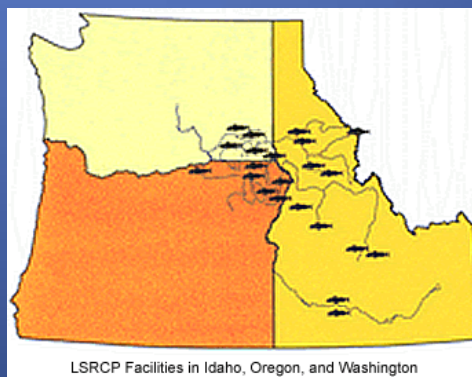




Dworshak Fish Hatchery



- Operated by the Nez Perce Tribe and U.S. Fish and Wildlife Service
- Funding through Corps, LSRCP, BPA
- Partners



LSRCP Facilities in Idaho, Oregon, and Washington



**US Army Corps
of Engineers®**

Dworshak Spring Chinook Production Past and Present

| Year | Fish (M) | Egg (M) | Broodstock |
|-------|----------|---------|------------|
| 2010 | 1.10 | 1.2 | 1,083 |
| 2011 | 1.07 | 1.4 | 923 |
| *2012 | 1.04 | 2.6 | 1,818 |
| 2013 | 1.66 | 1.9 | 1,520 |
| *2014 | 2.40 | 2.0 | 1,800 |
| 2015 | 2.30 | 3.0 | 1,944 |

Background Information

- Per the Federal Columbia River Power System BiOp: Operations at Dworshak Dam release sufficient cold water to maintain L. Granite Dam tailrace temperatures at or below 20°C to maximize survival of juvenile SR Fall Chinook Salmon
- The majority of the water for Dworshak NFH operations is pumped from the North Fork Clearwater River for production and adult holding

Impacts to our Water Supply during spill operations



- Colder temperatures for rearing and broodstock holding
- Elevated Total Dissolved Gas levels in the river: Water Quality cap at 110%



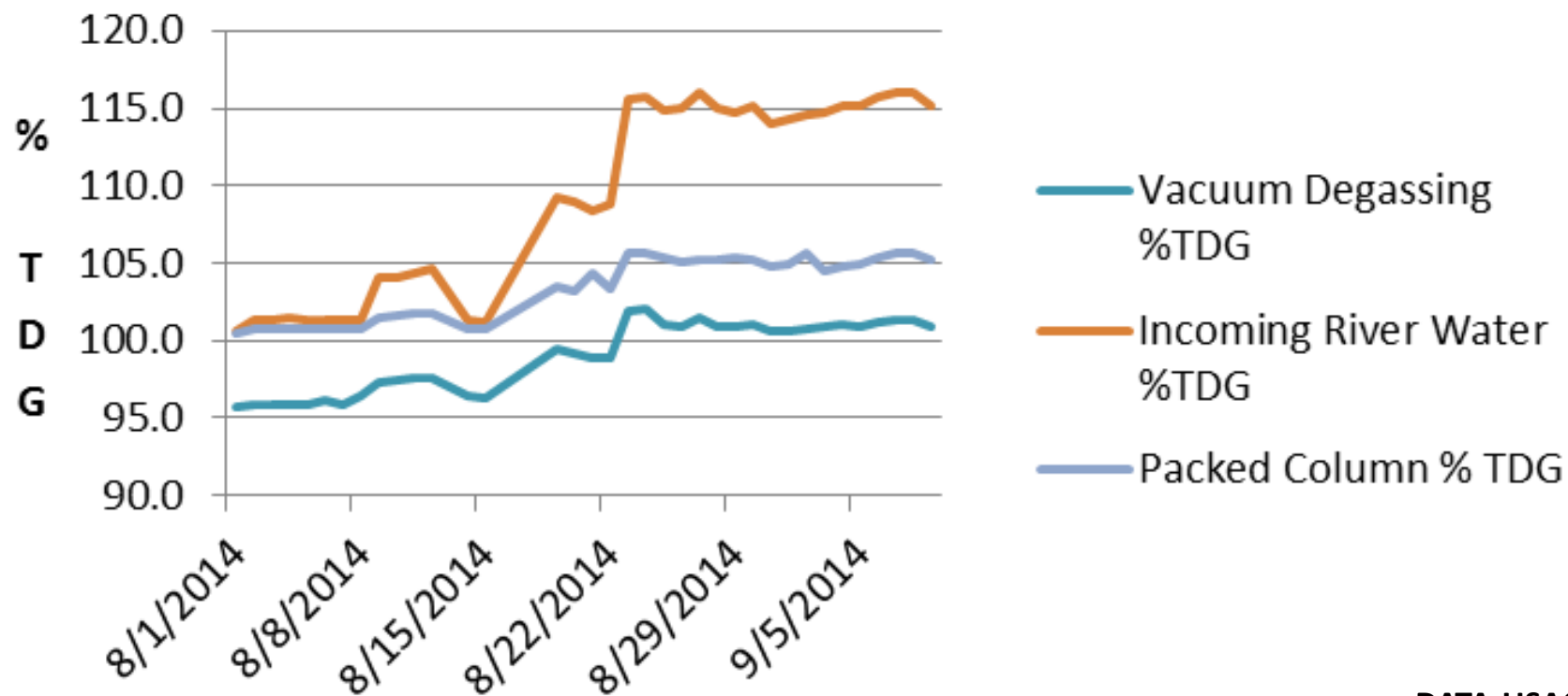
Vacuum Degassing

- Packed Columns replaced with Vacuum Degassers



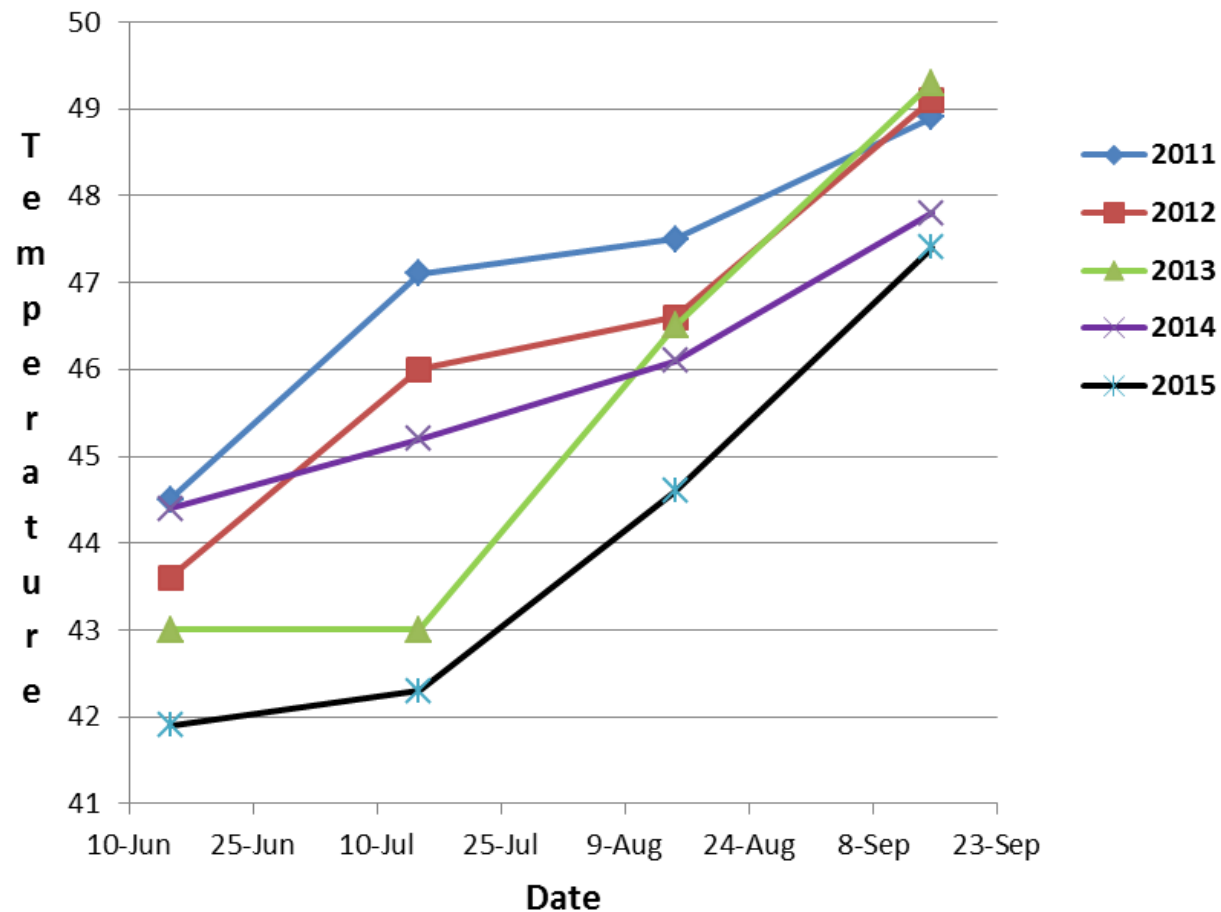
Total Dissolved Gas Data 2014

% TDG for River, Packed Columns and Vacuum Degassers

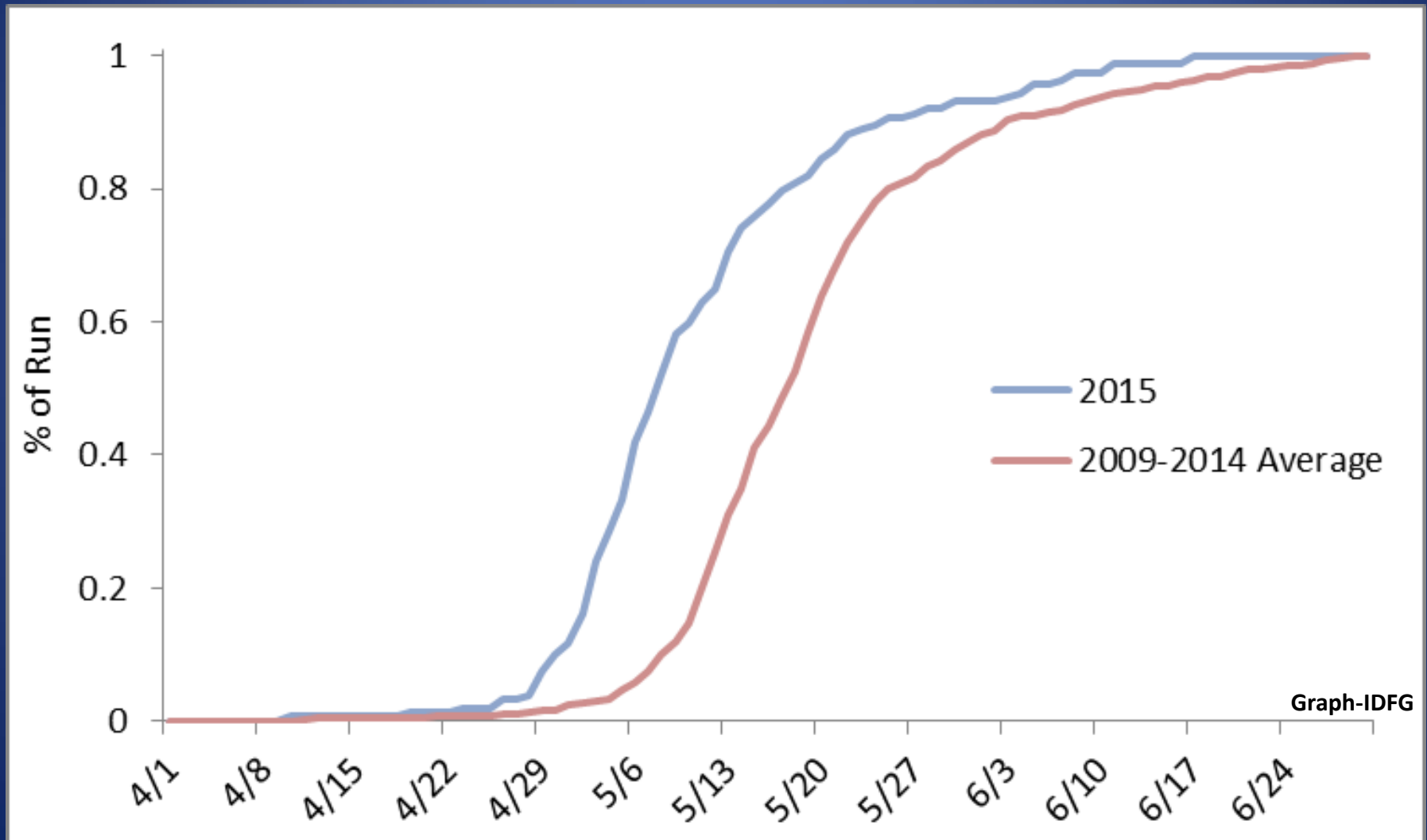


Water Temperatures

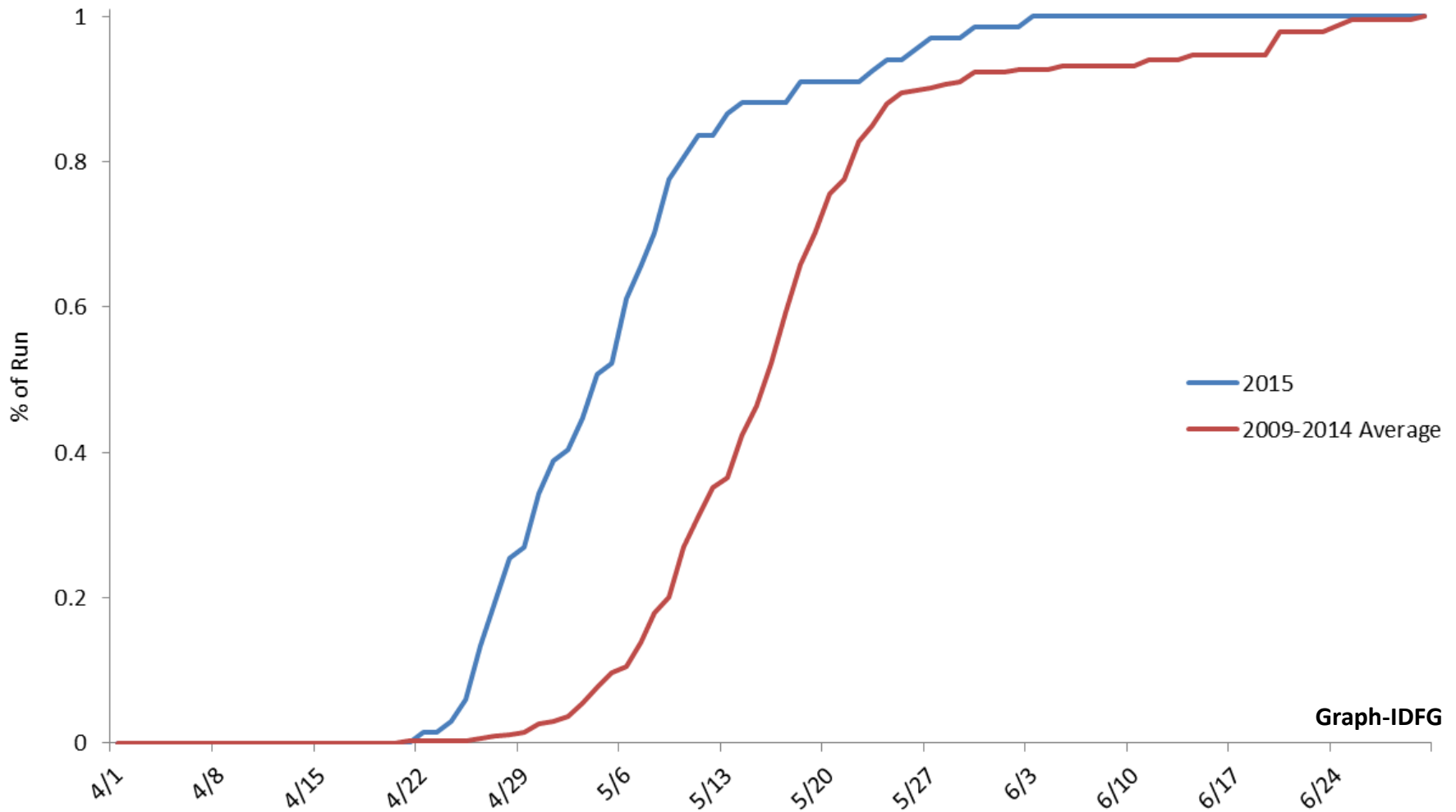
**Average Montly Water Temperatures
June-September 2011-2015**



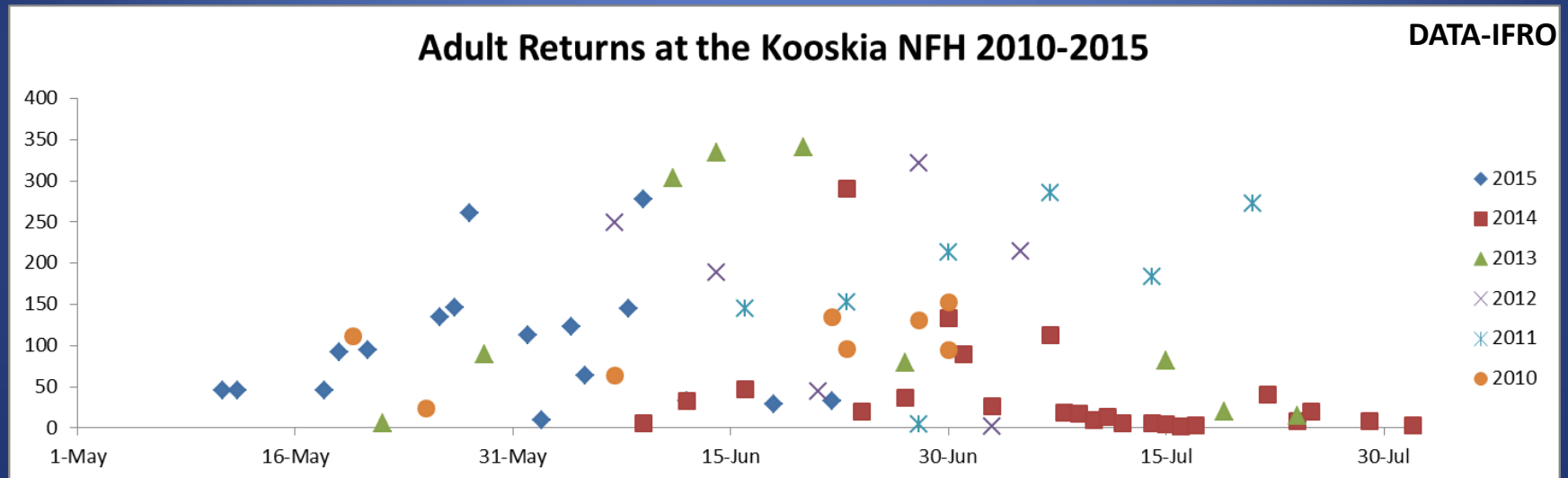
Adult Spring Chinook Return Timing at Lower Granite-Dworshak Fish



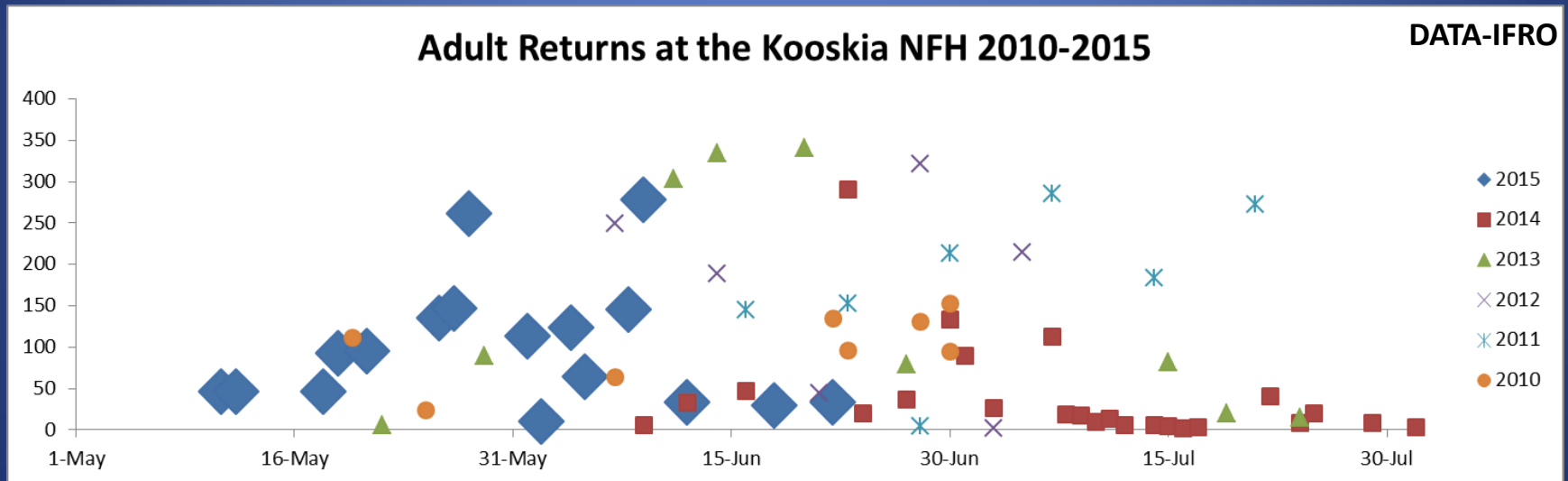
Adult Spring Chinook Return Timing at Lower Granite-Kooskia Fish



Kooskia NFH-Ladder Operations



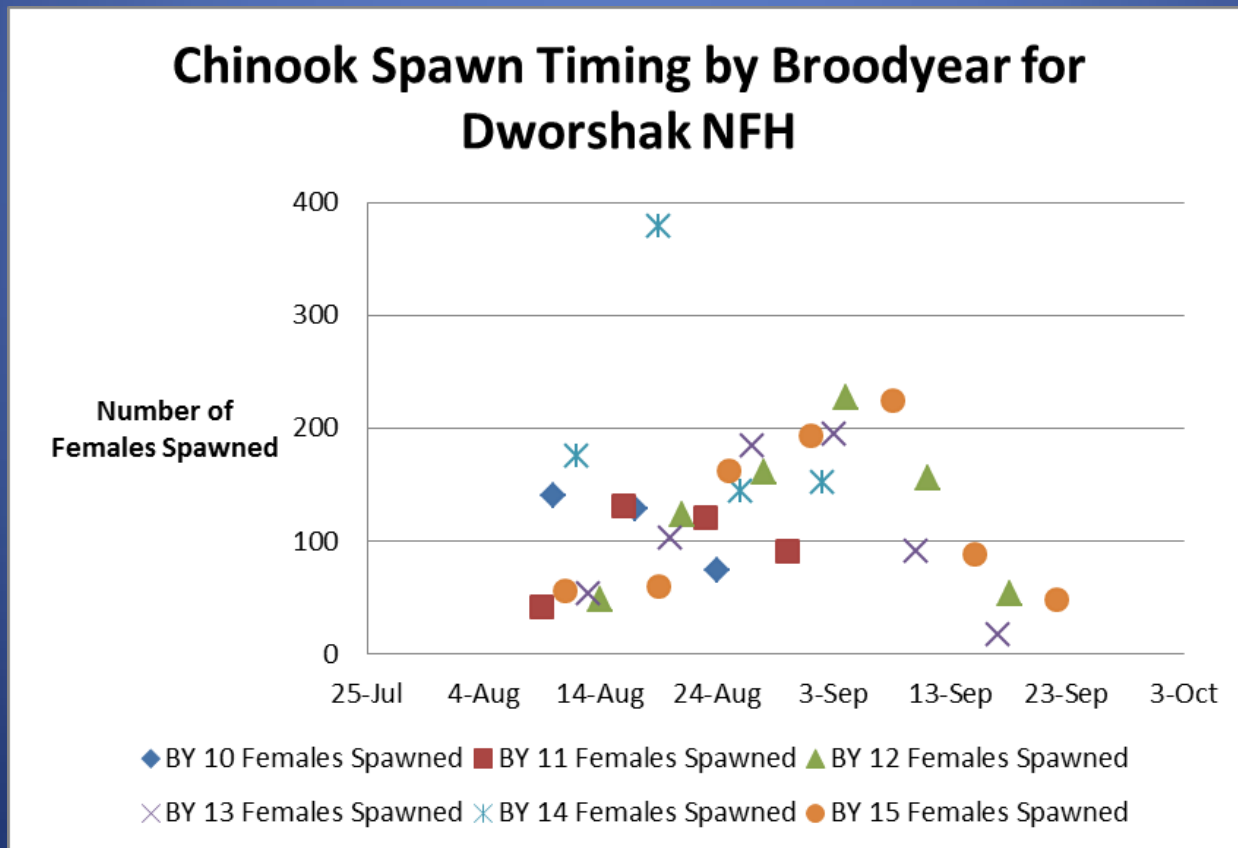
Kooskia NFH-Ladder Operations



Impacts to Dworshak Stock

Spawning in 2015

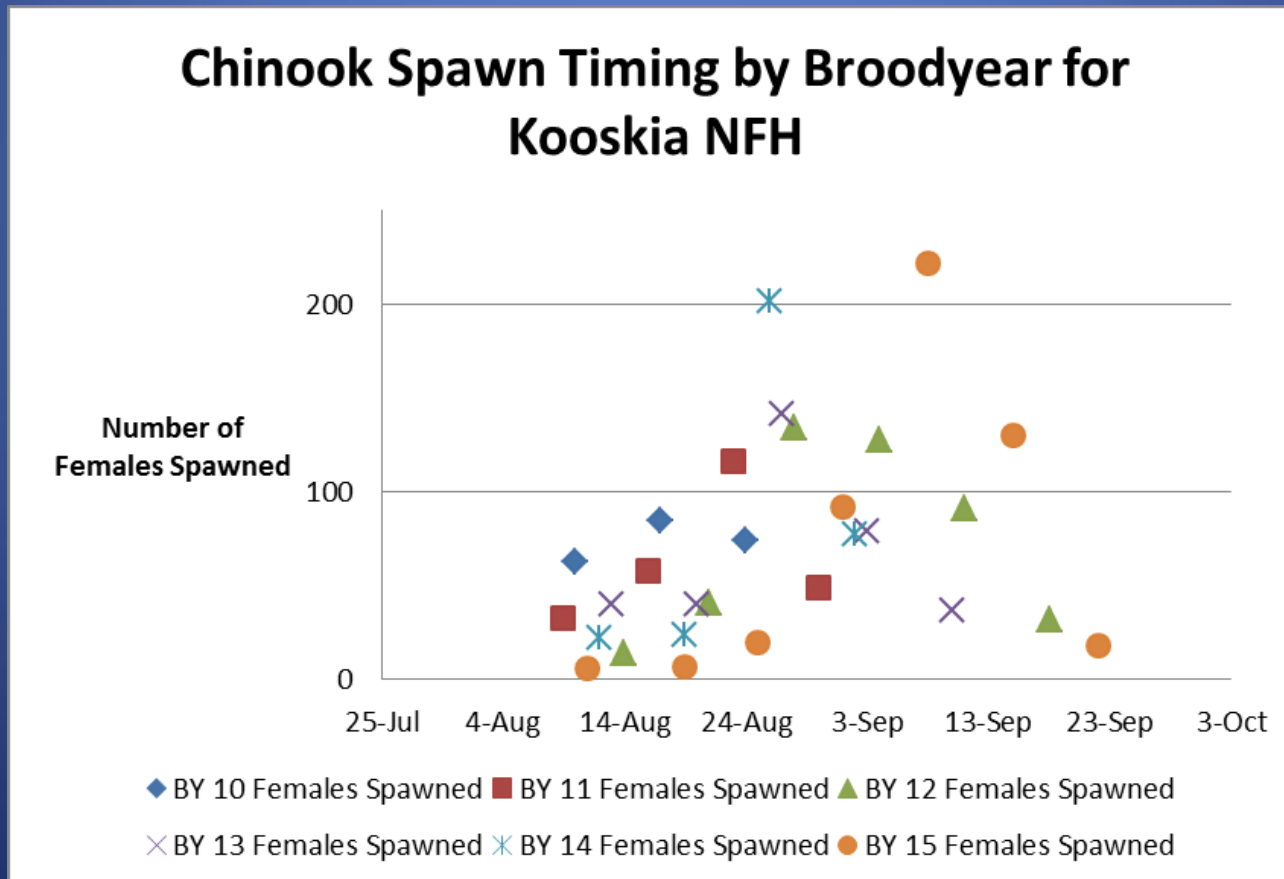
- Spring Chinook Adults: Holding in colder than “normal” water temperatures slowed maturation delaying spawning



Impacts to Kooskia stock

Spawning in 2015

- Kooskia Spring Chinook Adults: Spawning was even further delayed as adults were held in cold water for approximately 1 month longer



Impacts to Spring Chinook Spawning in 2015

- Typically, we meet egg collection target in 3-5 spawns.....this year 7 spawns with very low numbers of fish spawned during the 1st couple of spawns.
 - Additional handling and holding time: had significant adult mortality after the 5th spawn

Spring Chinook and Coho Impacts

- Adult spring Chinook spawning was delayed for both Kooskia and Dworshak due to colder than average holding temperatures
- Growth was slowed in Coho and Spring Chinook juveniles due to colder than average rearing temperatures resulting in the delay of clipping and tagging procedures.

Summer Steelhead Production

- Steelhead are reared on Reservoir Water during early rearing and therefore are not impacted until they are moved to System II and III burrows ponds where they are reared on the cold NFCR water.
- Actually some benefit in the colder water to our early takes (oldest) of steelhead in slowing growth on these fish as they will easily make target release size.

Bottom Line

- Met Spring Chinook egg targets
- Able to collect additional SCS adults for collective Clearwater River Basin Program where warm scenarios caused elevated adult mortality
- Spring Chinook and Coho production fish will still make size despite colder rearing temperatures (ability to control incubation temperatures- chillers or ambient)
- Steelhead smolt also on track for making size

Lessons learned

- Just because the fish returned earlier than the recent averages (2009-2014), doesn't mean they'll spawn earlier (cold holding conditions).
- Reminder NOT to get caught up in the old, "That's the way or when we've always done it"
 - Delay 1st spawning day by a week (Dworshak), maybe 2 weeks for Kooskia depending on water temps or other factors.
- Logistics-build flexibility into plans

QUESTIONS?

