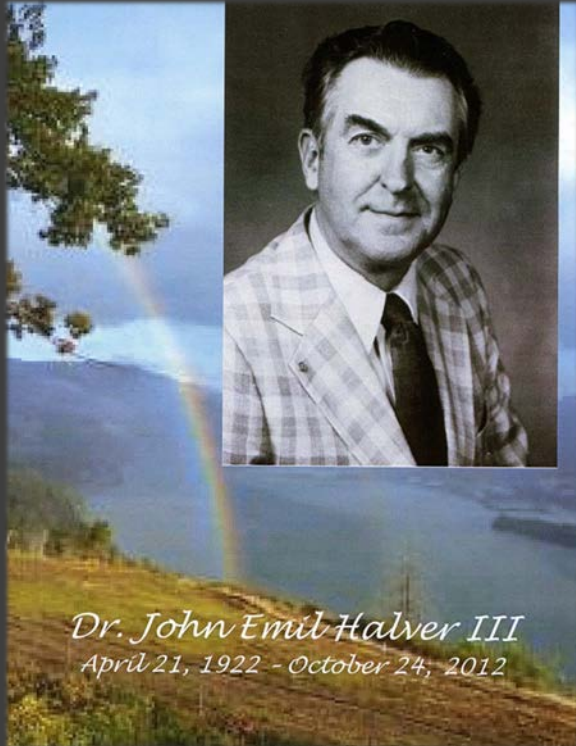
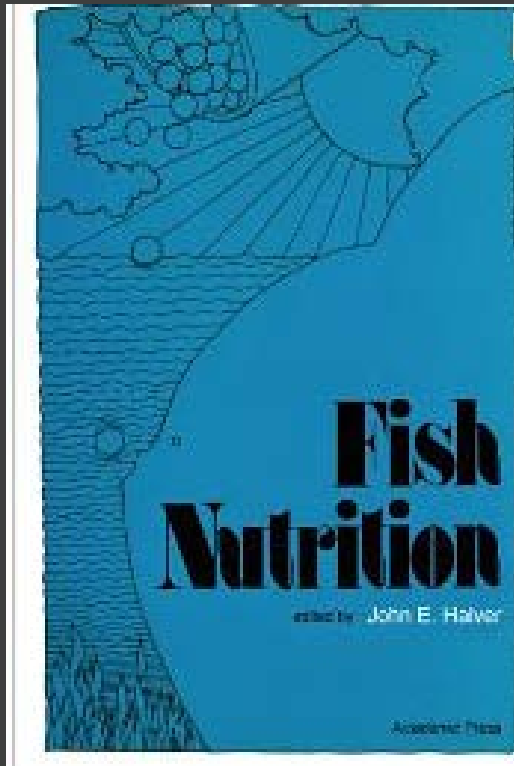


Dr. John E. Halver

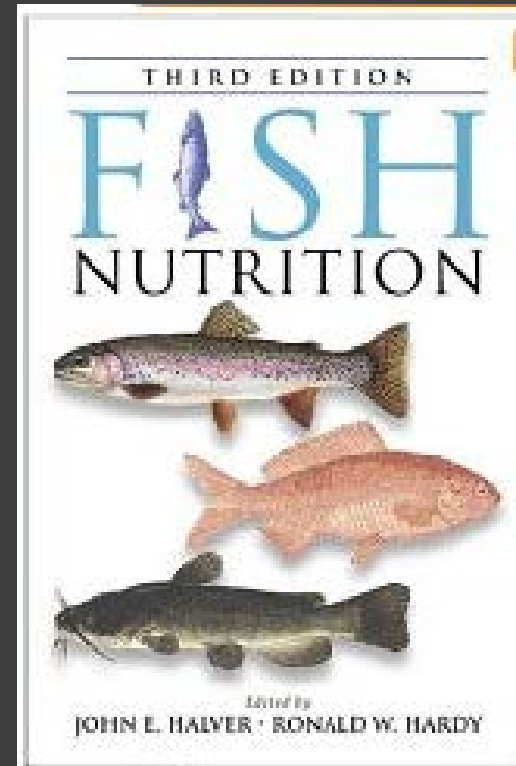
April 21, 1922-October 24, 2012



His seminal work



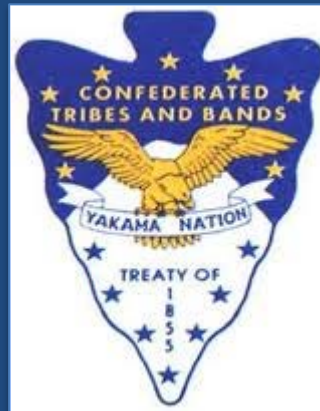
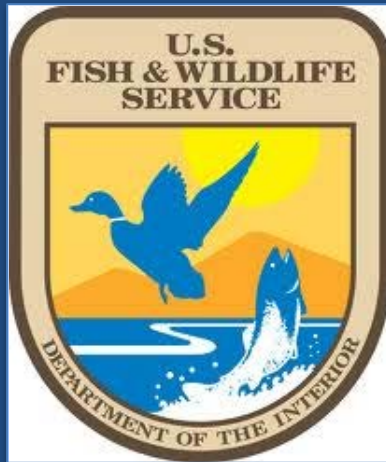
1972



2002

Successful disease management of spring Chinook captive broodstock at Little White Salmon National Fish Hatchery







Many Cooperators:

Priest Rapids Coordinating Committee, Hatchery Subcommittee

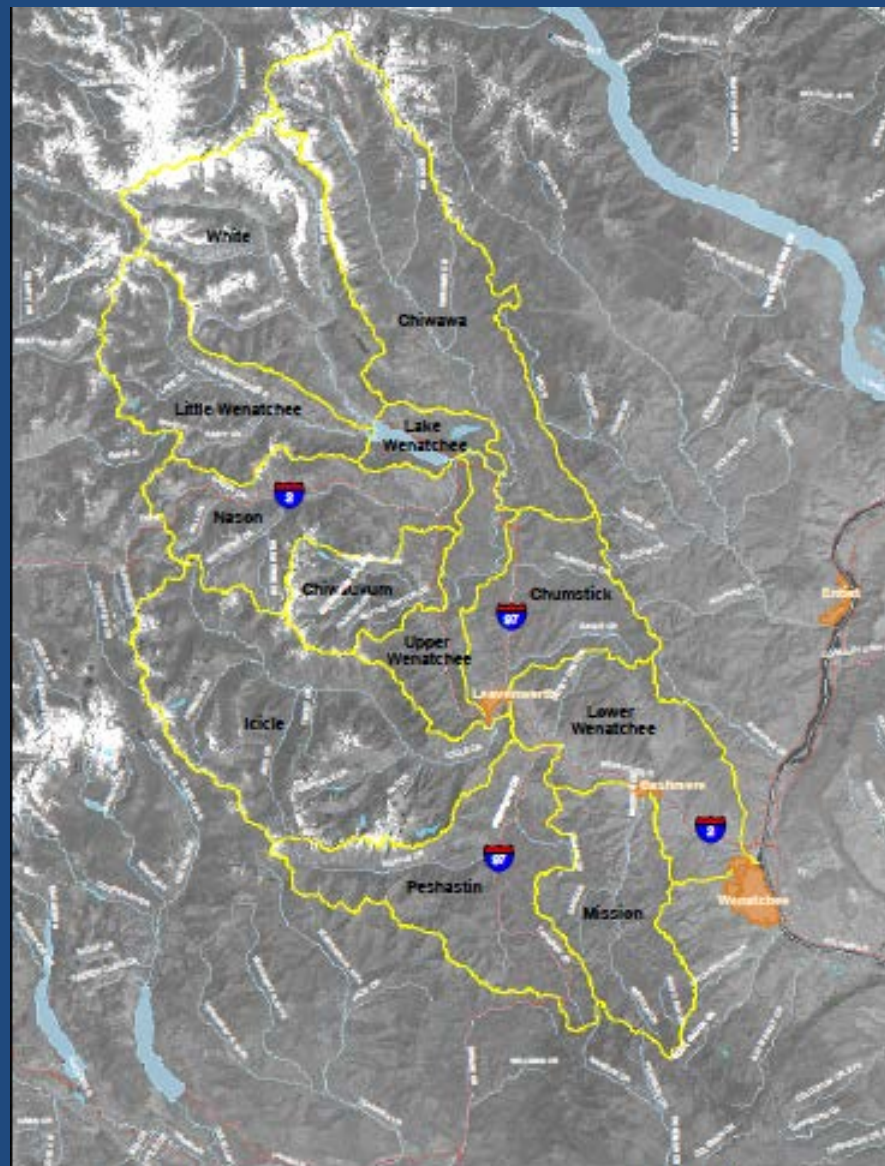
Bill Gale (US FWS), Craig Busack (NMFS), Tom Scribner, Keely Murdoch (Yakama Indian Nation), Kirk Truscott (CCT), Todd Pearsons, Russell Langshaw, Shannon Lowry, Eric Lauver (Grant Co. PUD); Mike Tonseth (WDFW)

Little White Salmon NFH

Speros Doulos
Casey Risley
Jim Rockowski
Peter Long
David Frost
Tyson Lankford
Orlanda John
Larry Leighton

Lower Columbia River FHC

Susan Gutenberger
Mary Peters
Ken Lujan
Spencer Meinzer
Dave Thompson
Matt Stinson
Alyssa Walker



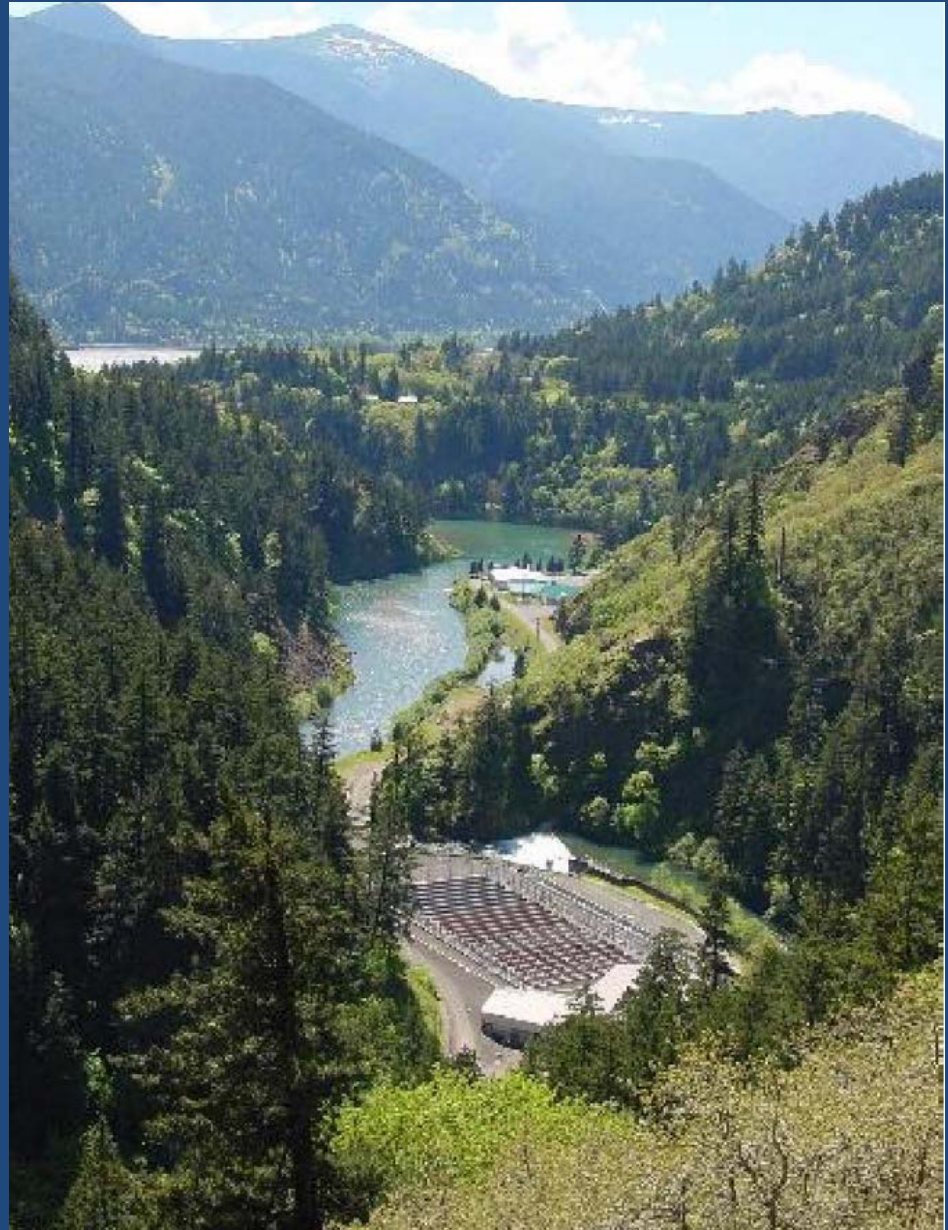
- Sub-Basins
- Highways
- Rivers
- Lakes
- Cities

Map 1
Sub-Basins in Wenatchee Watershed
 WRIA 45 Watershed Assessment



Little White Salmon National Fish Hatchery

Columbia River
Gorge National Fish
Hatchery Complex





**Little White Salmon river at the
hatchery intake**



**LWS river as it flows out of the
canyon into Drano Lake**





White River SCS at LWS and Willard NFH's (early rearing at Willard)

Brood Year	Arrived at LWS complex	Lifestage	Age at spawning (females)
2005	July 2008 February 2009	Maturing adults Adults	3 & 4 years
2006	November 2008	Subadults (post-smolt)	4 & 5 years
2007	October 2008	Juveniles	4 & 5 years
2008	October 2008 June 2009	Eggs Fry	4 years, 139 fish on station
2009	October 2009	Eggs	None yet, 620 on station

BY 2005 were the first adults to arrive
at LWS NFH



White River SCS recovering from anesthesia
in the transfer truck

Another BY2005 SCS

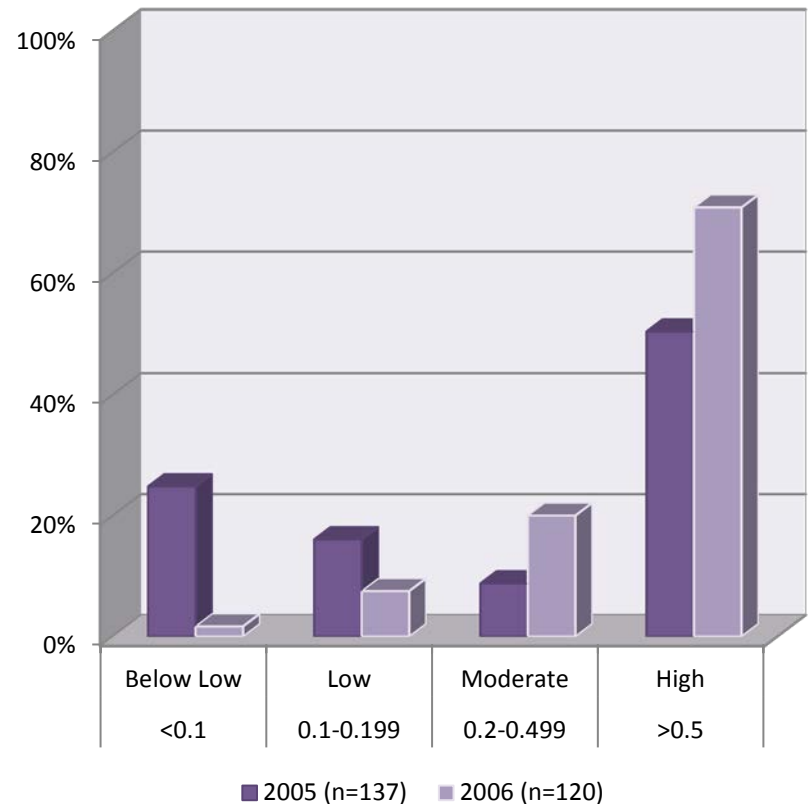


High prevalence of BKD in the broodstock

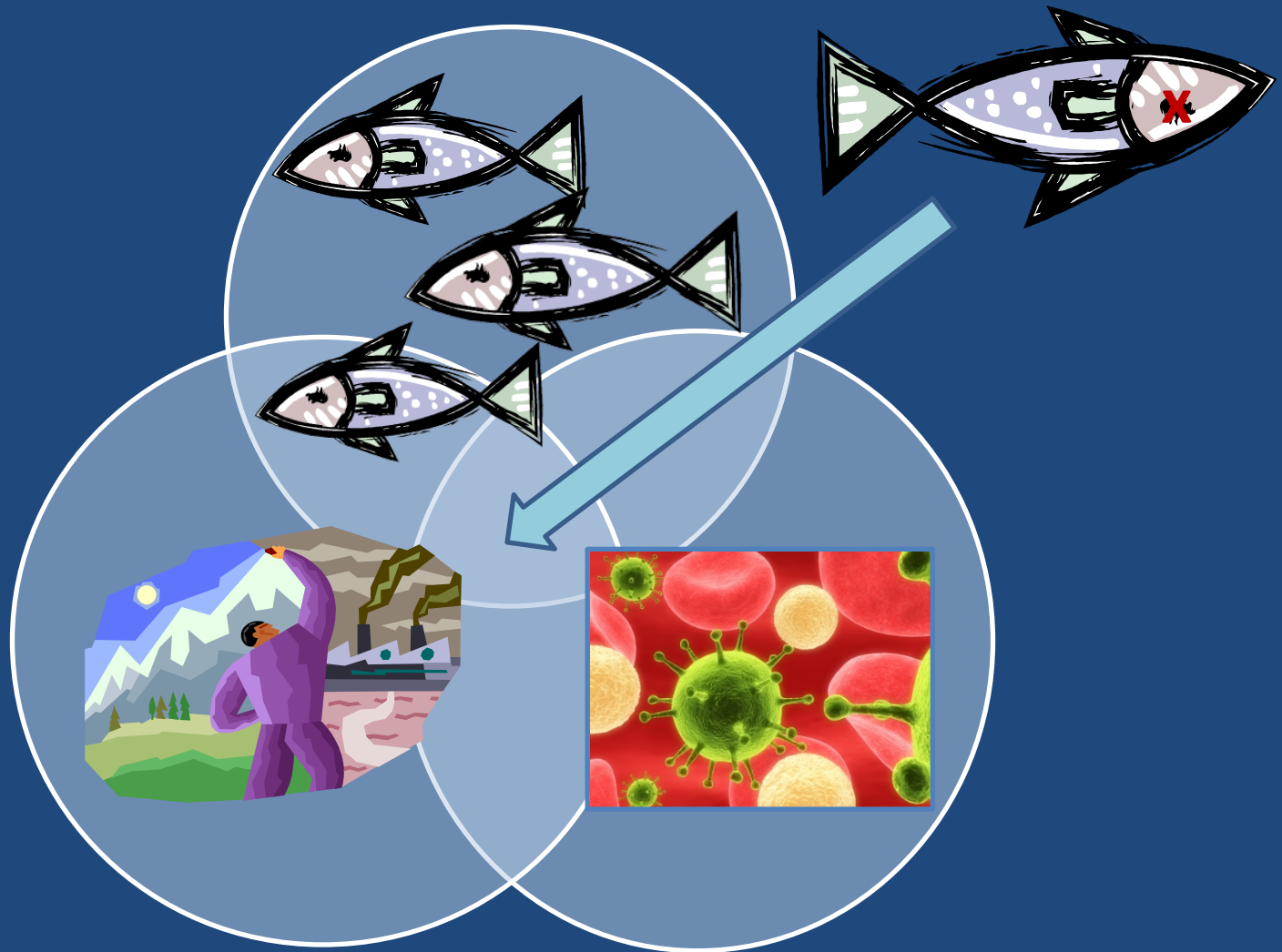
Very nice clinical BKD



Female ELISA O.D.'s at spawning
2005, WDFW data; 2006, LCRFHC data



How do we keep these fish alive?



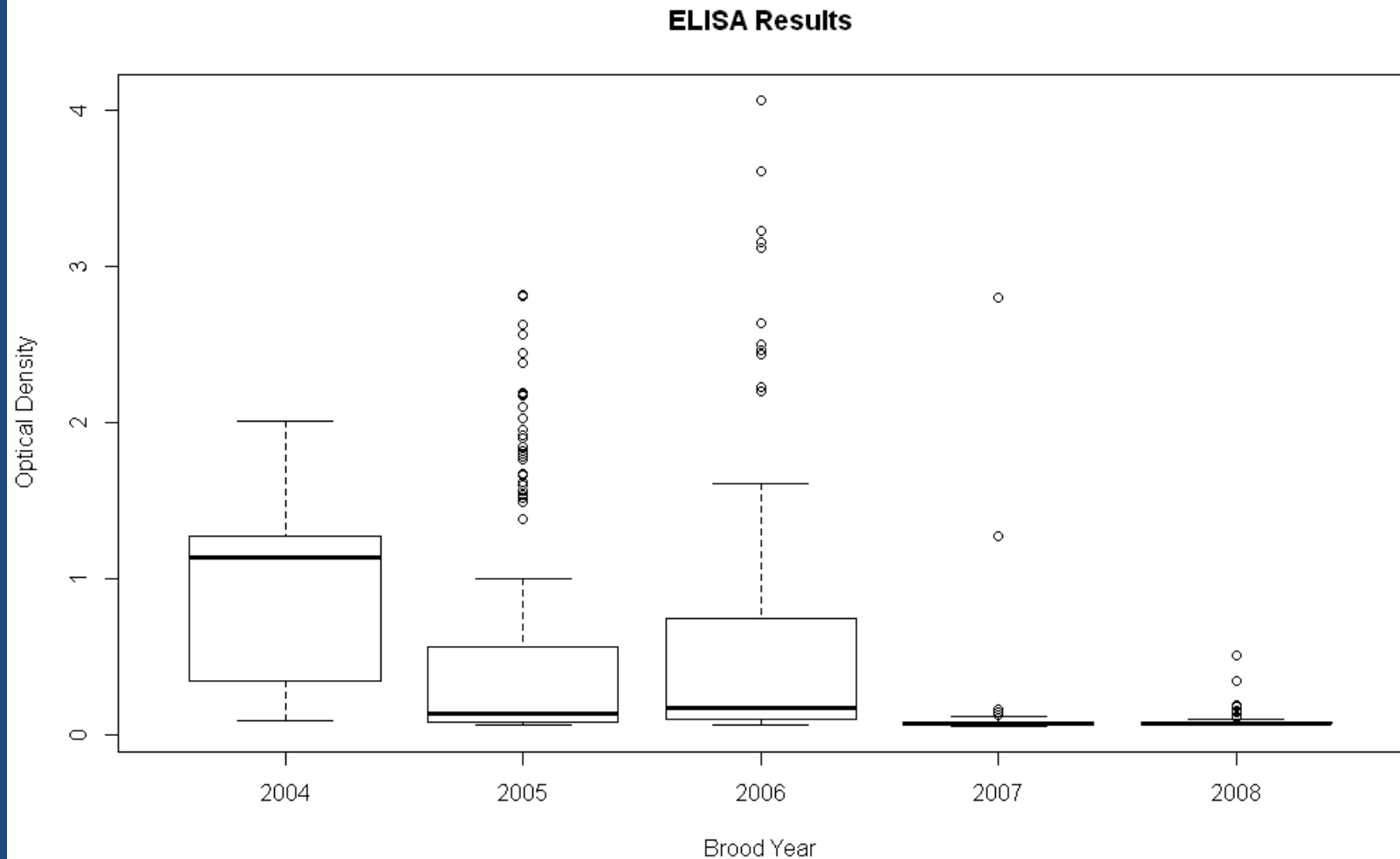
Azithromycin injections and feed treatments



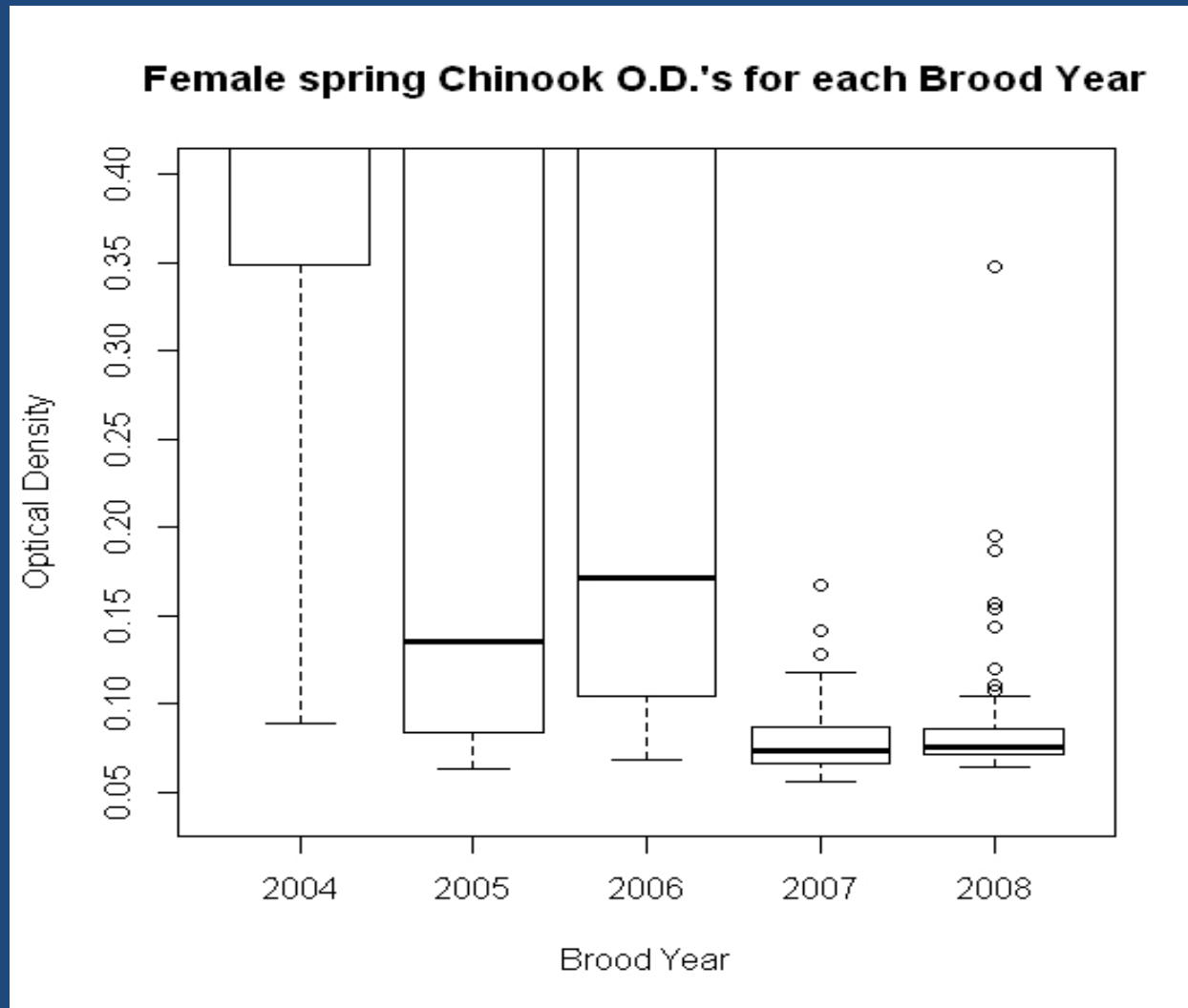
Brood year 2009, injections in conjunction with PIT tagging



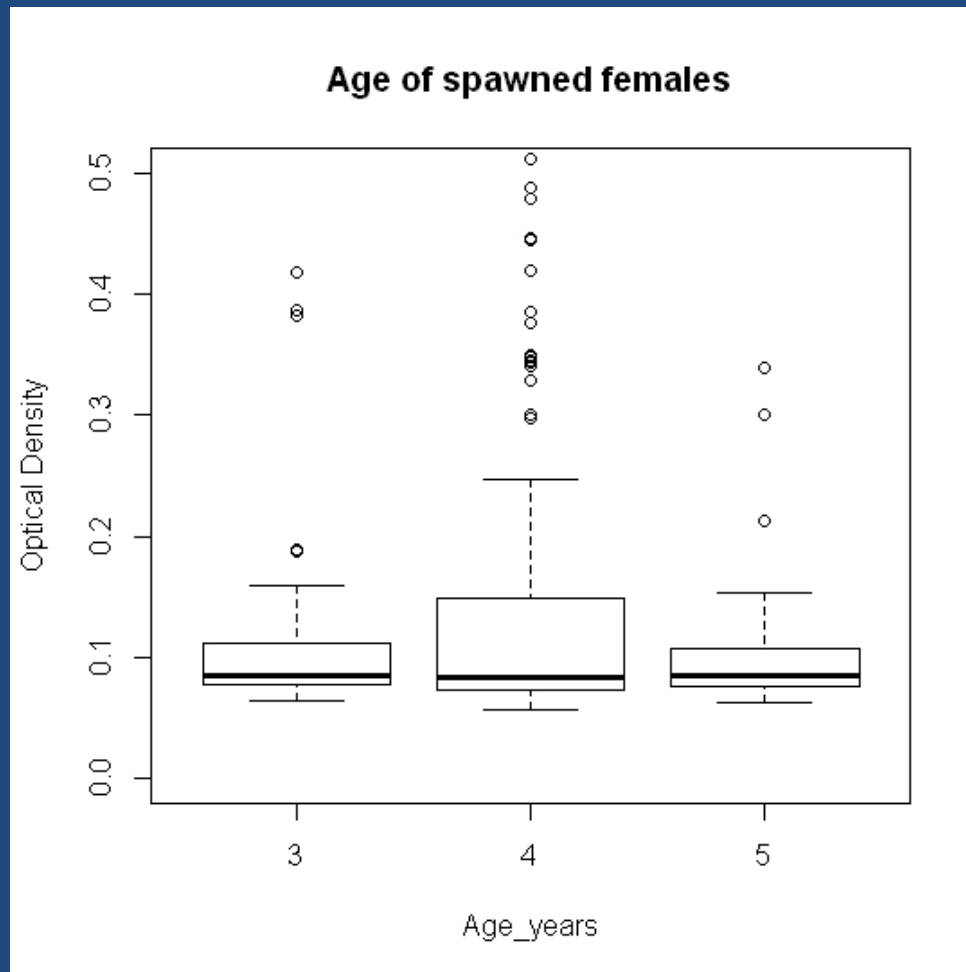
ELISA O.D.'s of females at spawning, females were 3, 4, or 5-years old



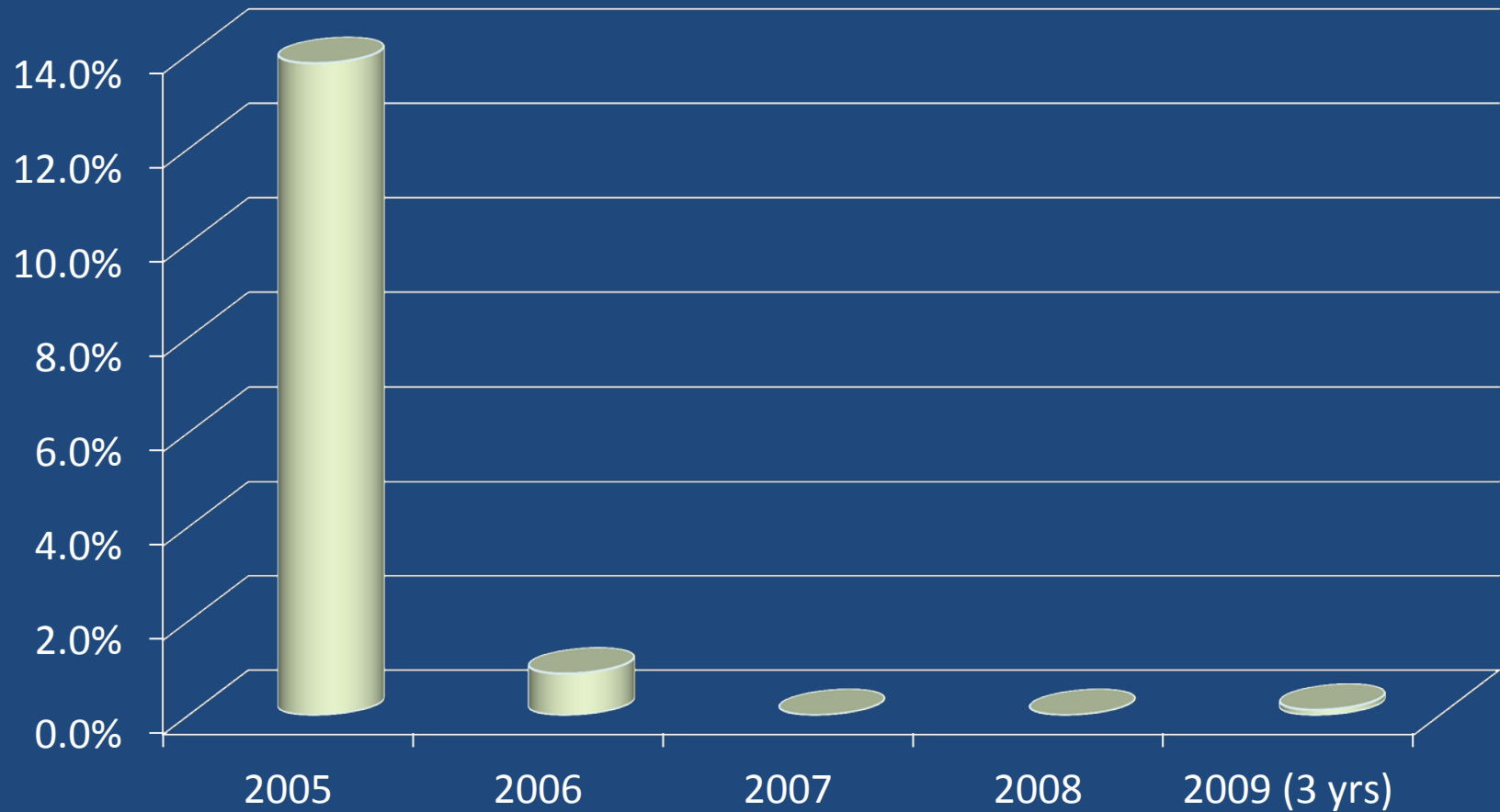
ELISA O.D.'s of females at spawning, females were 3, 4, or 5-years old



Was there an age effect with respect to BKD severity?



June % mortality pre-spawn 4-year olds



Gill copepods (*Salmincola* spp.)



Copepod

Necrotic
tissue

Copepod

Hydrogen Peroxide



SLICE (emamectin benzoate)



Conclusions

- Incidence and severity of BKD has decreased
- Lower BKD is not age-dependent
- Fish which arrived at LWS NFH as eggs have the lowest BKD
- A combination of azithromycin treatments, low rearing densities, and minimizing handling stress may be factors
- SLICE is an effective treatment for *Salmincola*

