

Idaho Department of Fish and Game



Lake Pend Oreille Quarterly Report
January - March 2005



Kokanee Survival and the Drawdown of 2003-04

by Melo Maiolie

Those with good memories may recall that the winter of 2003-04 was a full drawdown year for Lake Pend Oreille, with water lowered to the 2051' elevation. This drawdown had the support of the Department of Fish and Game since it was needed to allow wave action to build gravel areas along the shoreline that could be used as future kokanee spawning areas.

As mentioned in previous reports, a minimum of 271,000 ft² of spawning gravel was created along the shorelines during the winter draw down (Figure 1). This gravel was between the elevations of 2051 and 2053', and would be under 2 to 4 feet of water when the lake is held at an elevation of 2055' (as it was in the winter of 2004-05). These gravel bars should have been prime areas for kokanee spawning in November 2004.

Eggs that were spawned during the winter of 2003-04 became fry in the spring of 2004 and were sampled by fry trawling in August. This involved towing a fine mesh net with an opening of 2.4



Figure 1. Gravel bars along the shoreline of Lake Pend Oreille that formed during the winter drawdown of 2003-04.

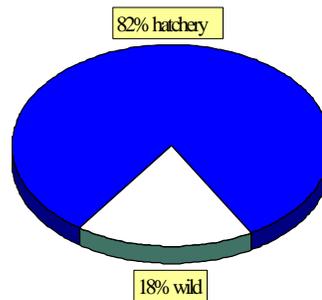


Figure 2. The percentages of hatchery and wild kokanee fry collected in Lake Pend Oreille in 2004.

yd². Thirty tows were made at random points in the lake. The collected fry had their otoliths removed (a small ear bone not much bigger than a grain of sand), and sent to a lab in Washington to determine whether the fry was a wild fish or produced in a hatchery. Those lab results are now finished and here is what we learned.

The first important finding was that most of the kokanee fry we collected in the lake in 2004 were produced by the Cabinet Gorge Fish Hatchery and not spawned in the wild. As a lake-wide average, only 18% of the fry were wild (Figure 2). This is a very low percentage of wild fry since it often is closer to a 50:50 split.

The entire lake was surveyed in August 2004 by echosounding to determine the abundance of kokanee fry. We estimated 6.8 million fry were in the lake; 2.4 million in the northern third, 2.5 million in the center third, and 1.8 million in the southern third. These were multiplied by the percent that were wild in each section to estimate that the lake contained 1.3 million wild fry. In 2003 we estimated that wild spawning kokanee laid 62

INSIDE THIS ISSUE:

Lake trout –Bull trout habitat overlap	2
Counting Kamloops	3
Activities for next quarter	4

SPECIAL POINTS OF INTEREST:

- *Kokanee had only a 2% egg-to-fry survival rate with the draw down of lake levels in 2003-04.*
- *82% of the kokanee fry in 2004 were produced by the hatchery.*
- *Bull trout and lake trout show considerable overlap in their use of the lake's habitat.*

Continued on page 2.

Kokanee Survival and the Drawdown of 2003-04, continued from page 1.

million eggs. Thus, we calculated a 2% egg-to-fry survival rate for wild spawning kokanee (Figure 3). This relatively low survival rate fits the pattern we have noted over the last 9 years; whenever the lake is drawn down to the full extent, kokanee survival is low particularly at higher densities of spawning kokanee. This low survival rate in 2004 is consistent with the low survival rates seen during much of the 1970's and 1980's when draw downs to 2051' were common. In retrospect, egg-to-fry survival was lower than we predicted largely because there were more mature kokanee than anticipated. But, shoreline areas got the much needed sorting of gravels, and water levels were kept higher during 2004-05. A pattern of higher and lower winter elevation appears needed in order to build shoreline gravel in some years, and improve kokanee spawning in others.

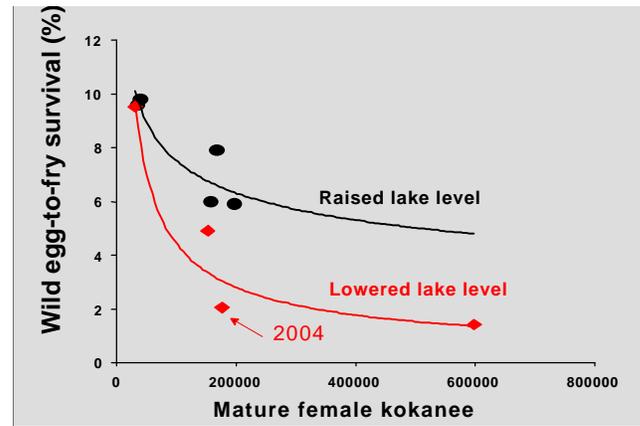


Figure 3. The egg-to-fry survival rate of wild spawning kokanee in Lake Pend Oreille.

Identifying Habitat Overlap Between Bull Trout and Lake Trout

By Tom Bassista

After nearly 2 years of tracking bull trout and lake trout in Lake Pend Oreille we have good information on how these two species overlap. Lake trout, which were introduced into the lake in 1925, pose a risk of replacing bull trout if their numbers continue to increase, as seen in other northwest lake systems (e.g. Priest Lake, ID and Flathead Lake, MT).

Bull trout are currently under federal protection via the Endangered Species Act and cannot be harvested anywhere in Idaho. One of our goals is to perpetuate bull trout in Lake Pend Oreille and once again provide a recreational harvest fishery.

By sonic tracking both species on a seasonal basis using depth-sensing transmitters we were able to acquire depth and habitat use information and determine if and when these species occupy similar areas. Some interesting patterns have emerged. In general, bull trout and lake trout were predominantly (>80%) found nearshore or close to the bottom at depths less than 150 ft during spring, summer, and fall. During the winter, bull trout (40%) were located over deep-open water areas more often than lake trout (30%).

The biggest contrast between the two species was the difference in average depth use. During all seasons bull trout used shallower mean depths than lake trout (Figure 4). Species preference of water temperature may help explain the difference in depths during the spring and summer when lake trout utilized colder water than bull trout (i.e., lake trout may prefer colder temperatures than bull trout). However, during the fall and winter periods temperature use was similar and bull trout maybe selecting shallower depths due to the presence of lake trout or maybe because they prefer shallower depths.

So far, the bull trout population is holding steady. A big worry is that lake trout could collapse kokanee, thereby causing a huge impact to the bull trout forage base. With this considerable habitat overlap between these species, pronounced competition could be expected if food is limiting.

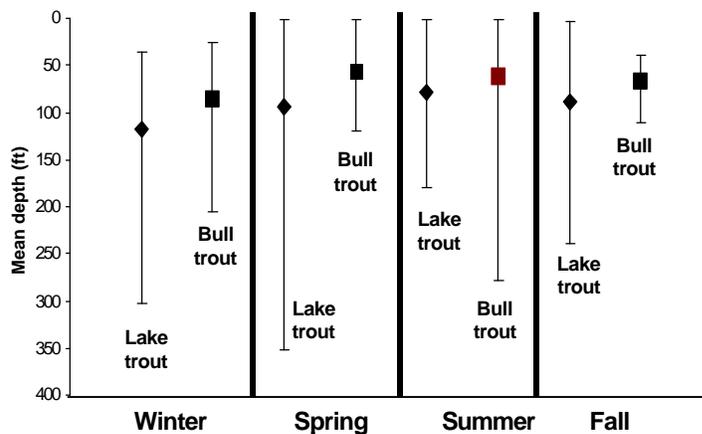


Figure 4. Seasonal mean depths used by bull trout and lake trout. Depth data were collected during day and night. Vertical bars at each point indicate the minimum and maximum depth used by each species.

New Strategy for Counting the Elusive Kamloops

By Tom Bassista

During August of this year we will experiment with the use of side-scan sonar to help determine a population estimate of rainbow trout larger than 16". Tracking results from last summer suggested that rainbow trout used an average water depth of 25 ft and were found from the surface down to 70 ft. The hydroacoustic equipment we were using last year was comprised of a down-looking transducer (as is typically found on most recreational fishing boats) and only detected fish larger than 16" below 35 ft. Because of fish spooking away from the boat in water less than 35 ft, we missed a portion of the rainbow trout population we were attempting to count.

The total numbers of fish we counted that

were too big to be kokanee was approximately 14,000 fish during the summer of 2004. Our tracking information suggests a large portion of these fish were probably not bull trout or lake trout and we suspect many of those 14,000 fish were rainbow trout. By using side-scan sonar (Figure 5) in addition to down-looking sonar we may be able to count additional rainbow trout and come up with a more accurate estimate of the population. Side-scan sonar typically allows a researcher to detect fish as far out as 150 ft and down to 30 ft. By having an accurate count of rainbow trout we may be able to determine their impact on the kokanee population and help recover the kokanee fishery.

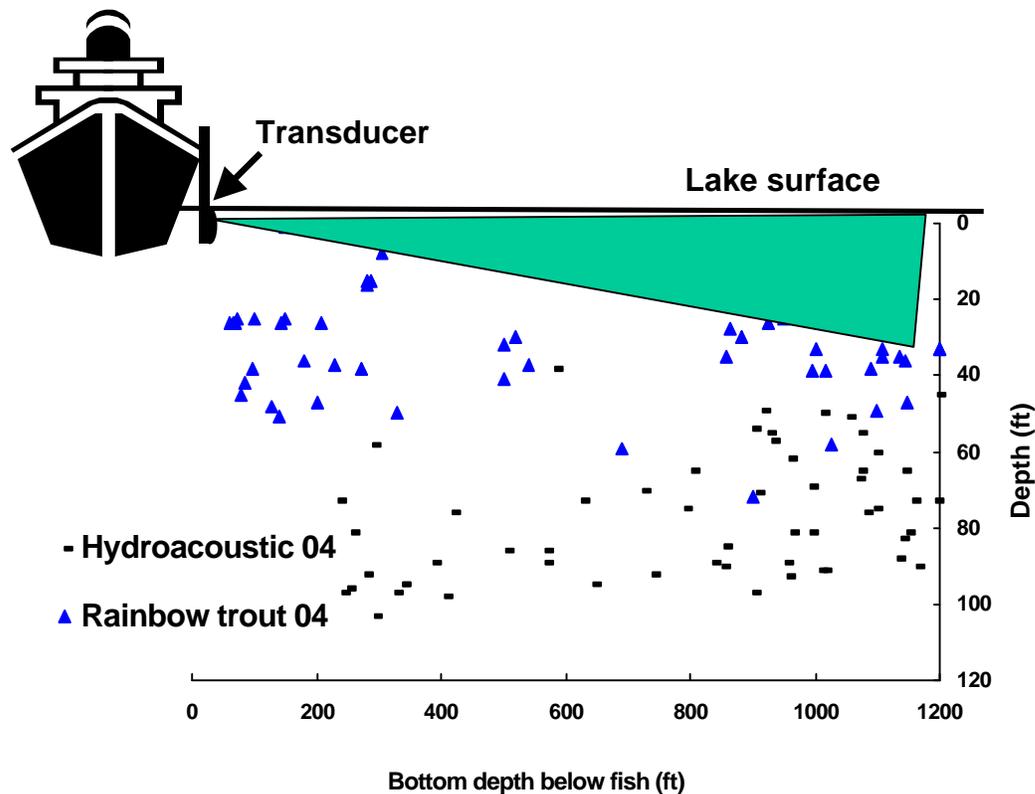


Figure 5. Actual depth distribution of 8 sonic tagged rainbow trout and hydroacoustic targets > 16" determined during the summer of 2004. Figure also depicts the use of side-scan sonar to detect fish from the surface down to 30 feet. All hydroacoustic targets detected in this figure were located by down-looking techniques (note that no hydroacoustic targets were detected in the top 35 ft).

Links

To Past Reports

Are you looking for past reports concerning Lake Pend Oreille?

They can be found on the Idaho Fish and Game's Home Page (<http://www.fishandgame.idaho.gov/tech>) then under "research reports" click "fisheries" then do a word search on "Lake Pend Oreille" and hit the green arrow.

What about Lake Pend Oreille Annual Reports?

These reports can be located on the Bonneville Power Administration Fish & Wildlife Home Page (<http://www.efw.bpa.gov/searchpublications/>). Then search for reports with "Lake Pend Oreille" in the title.

Questions and comments on this quarterly report should be addressed to:

Idaho Fish and Game,
PO Box 806
Bayview, Idaho 83803

(208) 683-9218
Fax (208) 683-3054



Activities for next Quarter

The Bonneville Power Administration requires that quarterly reports contain a description of the activities for the next quarter of the year. Limnological sampling will begin in April and will be conducted monthly through October. Sampling will include temperature, oxygen, Secchi transparency, and collection of zooplankton (with two sizes of nets). During the new moon phase in June researchers will collect *Mysis* (opossum) shrimp to make an annual density estimate. Hydroacoustic gear will be recalibrated sometime in June in preparation for our annual surveys of kokanee. Researchers will also be preparing three talks on project findings that will be given at the Resident Fish/International Kokanee Workshop in Spokane in June. During the spring fishing derby, Researchers will also be examining lake trout caught by anglers to determine age at first maturity. This information will help in our efforts to model the lake trout population.

Good fishing!



The Lake Pend Oreille Fishery Recovery Project Staffed By:

- Melo Maiolie, Principal Fishery Research Biologist
- Tom Bassista, Sr. Fishery Research Biologist
- Mike Peterson, Fishery Research Biologist
- Bill Ament, Senior Fisheries Technician
- Bill Harryman, Senior Fisheries Technician
- Mark Duclos, Fisheries Technician
- Jake Miller, Biological Aide