# Panhandle Region
## Annual Fisheries Report
### *2010 Activities and Accomplishments*

Issue 3 January 2011

### Regional Fisheries Program Staff

**Jim Fredericks,**
Regional Fishery Manager
(jim.fredericks@idfg.idaho.gov)

**Mark Liter,**
Regional Fishery Biologist
(mark.liter@idfg.idaho.gov)

**Ryan Hardy,**
Regional Fishery Biologist
(ryan.hardy@idfg.idaho.gov)

**Melo Maiolie,**
Regional Fishery Biologist,
(melo.maiolie@idfg.idaho.gov)

**Rob Ryan,**
Regional Fishery Biologist,
(rob.ryan@idfg.idaho.gov)

### Pend Oreille Research Staff

**Andy Dux,**
Principal Research Biologist
(andy.dux@idfg.idaho.gov)

**Nick Wahl,**
Fishery Research Biologist
(nicholas.wahl@idfg.idaho.gov)

**Bill Harryman,**
Sr. Fishery Technician
(bill.harryman@idfg.idaho.gov)

**Bill Ament,**
Sr. Fishery Technician,
(bill.ament@idfg.idaho.gov)

### Kootenai River Research Staff

**Vaughn Paragamian,**
Principal Research Biologist
(vparagamian@idfg.idaho.gov)

**Pete Rust,**
Sr. Fishery Research Biologist
(pete.rust@idfg.idaho.gov)

**Cathy Gidley,**
Fishery Research Biologist
(cathy.gidley@idfg.idaho.gov)

### Hatchery Staff

**John Rankin,**
Fish Hatchery Manager
(john.rankin@idfg.idaho.gov)

**Steve Kammeyer,**
Asst. Fish Hatchery Manager
(steve.kammeyer@idfg.idaho.gov)

**Contact us at:**
**(208) 769-1414**

*We hope you enjoy the following summary of research and management activities in 2010. Though by no means a complete list, this newsletter describes some of the most noteworthy projects and surveys in the Panhandle Region.*

*This newsletter is posted on the IDFG website http://fishandgame.idaho.gov/cms/about/offices/panhandle/ If you find it interesting, tell your friends and fishing partners and pass it along. We can most effectively serve anglers when they stay informed and involved. If you have questions or want to share your thoughts, please give us a call. If you'd like to be included on an e-mail distribution list for periodic summaries and important information, please send a request to jim.fredericks@idfg.idaho.gov and we'll add you to the list.*

## Inside this issue:



## *Kid's Bluegill Clinic*

Sixty lucky kids and their parents enjoyed a day of fishing and barbequing at the first annual "Kids Bluegill Fishing Clinic" on June 19th. The event was sponsored by IDFG and the Panhandle Bass Anglers (PBA). The participants, ranging in age from 4 to 16, first learned the basics of fishing and then tested their new found knowledge on Rose Lake.

After a brief lesson and orientation, each participant received a brand new rod and reel from Cabela's. Once equipped, the young anglers and their guardians hopped aboard one of the PBA members sparkling bass boats for a two hour trip where they learned the finer points of bluegill fishing. For those young anglers that preferred a little more security, Tobler Marine of Coeur d'Alene provided a 20 ft. Weldcraft and a new pontoon boat.

Fortunately, both the weather and the fish cooperated, and every participant caught fish—for many, their first.

Following the fishing trip, the kids and parents moved to a fish cleaning/filleting demonstration where they learned to process their catch. Then it was time for lunch where participants enjoyed 12 pounds of bluegill fillets, 150 hamburgers, and lots of chips and soda.

Not only did every participant catch fish, they landed some prizes as well. Thanks to the many generous local merchants who contributed valuable prizes, each youngster walked away with a new rod and reel plus one of many drawing prizes valued at up to $100.

For those anglers who caught their first fish IDFG handed out "First Fish Certificates" to commemorate the event and capture the memory. Catching your first fish is always special and memorable and the excitement of a first fish spread to everyone involved, parents, bass club members, IDFG employees.

We hope that events like this help build the next generation of anglers by demonstrating how simple, inexpensive, and fun fishing can be—even for beginners. Fishing not only helps get kids acquainted with nature, but it can provide countless family memories.

# Kokanee Up, Lake Trout Down

***Pend Oreille Fishery Recovery Effort Continues to Show Results***

It's been another encouraging year on Lake Pend Oreille, with lots of indications the fishery recovery effort is heading in the right direction. The kokanee population continues to rebuild as predation decreases, while the lake trout population shows more signs of overharvest. Between netting and angling, over 26,000 lake trout were removed from Pend Oreille in 2010. This brings the total since 2006 to over 115,000 fish (Table 1). Anglers not only saw more rainbows than previous years, but some of the largest fish in recent history were caught. At least one rainbow over 25 pounds was harvested in the fall, and anglers reported several others over 20 pounds. As long-time Pend Oreille anglers have been expecting, more kokanee means bigger rainbows.

**Table 1.** The number of lake trout removed from Lake Pend Oreille by netting and by angling (turned in to the Angler Incentive Program) since the fishery recovery effort began in 2006.

| | 2006 | 2007 | 2008 | 2009 | 2010 | TOTAL |
|---|---|---|---|---|---|---|
| Angling | 11,041 | 17,665 | 13,020 | 7,366 | 8,740 | 57,832 |
| Netting | 4,274 | 5,836 | 11,761 | 17,596 | 17,704 | 57,171 |
| Yearly Total | **15,315** | **23,501** | **24,781** | **24,962** | **26,444** | **115,003** |

## *Kokanee*

Kokanee egg take at Sullivan Springs is complete and the hatchery crew collected over 10 million eggs and handled about 100,000 fish! This is very encouraging news, considering that the *combined* take in 2007 and 2008 was only around 1 million eggs. Amazingly, if cold weather in November and heavy rains in December hadn't pushed some of the spawners back out of the stream before they were ripe, the crew may well have been looking at 3-5 million additional eggs. With any luck, those fish that went back to the lake spawned on their own in suitable shoreline gravels. Either way, the highly successful egg-take this year helps insure an abundant year class of fry for release in 2011.

Many people, including IDFG biologists, were excited to see the tremendous return of early-spawning kokanee to Pend Oreille tributaries in September. Between Granite, Trestle, North Gold, Gold, and Grouse creeks we estimated an escapement that likely exceeded 40,000 early spawners. Most of these fish are likely two and three-year-old hatchery fish released in 2007 and 2008. While this is very encouraging, and suggests survival was much improved, it's important to recognize that the early spawning kokanee, which rely on tributaries, can never fill the void of the late spawning population, which relies on the shoreline. To illustrate the point, consider that this year's escapement of 40,000+ fish is a tiny fraction of the historical late spawner escapement, which regularly exceeded a half million. In other words, tributary spawning habitat is far more limited than lake shore habitat when lake levels are managed to support spawning kokanee. Further, eggs deposited in tributaries face risks from high flows that dislodge eggs or deposit sediments. For example, a major rain on snow event already occurred this winter and may have substantially reduced survival of eggs deposited by early spawners in the fall. Although early spawners are making a valuable contribution, the future of kokanee in Pend Oreille lies primarily with late spawning fish.

Speaking of late spawning kokanee, the research crew out of Bayview counted shoreline spawners, and the results were also encouraging. The peak shoreline count was about 8,200 kokanee spawners, which was three times higher than last year and the highest count we've seen in many years. Many shoreline spawning kokanee are too deep to easily see, so the number counted represents only a fraction of the total number of shoreline spawners. The counts are however, a valuable index and further evidence of a rebounding kokanee population.

*The weak age-2 year class and the poorer survival those fish experienced this year highlights that we are not out of the woods with predation*

Monitoring spawner returns tells us how well mature kokanee are doing, but we also evaluate other age classes to fully assess the status of the kokanee population. To do this, we conduct trawling and hydroacoustic surveys every August and September. Results from these surveys tell us whether upcoming age classes of kokanee are strong or weak and give us annual survival rate estimates. In 2011, surveys indicated more mature fish than last year, which was confirmed by the good spawner returns later in the fall. Abundance of age-1 (1.1 million) and age-3 (362,000) kokanee were similar to last year. Unfortunately, age-2 abundance (227,000) was very low. We expected this to be a weak age class because these fish were produced from spawners that returned in 2007. This was the year kokanee spawners were at a record low. Related to the low age-2 abundance, survival rate was 22% from age-1 to age-2 compared to 69% last year. Fortunately, survival rates for other age classes remained stable. We are concerned about the survival decrease and are working to understand what might be causing this. The weak age-2 year class and the poorer survival those fish experienced this year highlights that we (continued next page)

are not out of the woods with predation. We have greatly reduced predation during the past few years, but it still poses a threat to kokanee. Sustaining good survival will be the key to the speed of the recovery process and eventually re-opening a kokanee fishery.

## Lake Trout Control

Biologist Nick Wahl surgically implants a sonic tag in the abdomen of a lake trout.

The commercial netting equipment was deployed from February 1 through May 21 and again from August 30 through December 17th in the fall. In 2011, the crew will resume in mid-January. Over the past two years, we've been testing the effectiveness of netting in the winter months. We've learned that not only does it minimize problems between netting and angling, it's a productive time to target juvenile lake trout and avoid bull trout as well.

From mid-September through mid-October gillnets were set in the two primary spawning areas near Windy Point and Echo Bay. For the five week period, the netters used two boats, with one stationed out of Hope and one stationed out of Farragut. As in past years, telemetered (sonic tagged) fish have been used to guide the efforts. Unfortunately, a third spawning site was discovered from telemetry work this fall. A shoreline site near Evans Landing was used by spawning fish, although the aggregation of fish was much smaller than at the other two spawning sites. At the three sites combined, approximately 2,000 spawners were removed during the 2010 spawning season.

Outside of the spawning season, netting efforts have been focused on the "nursery areas" around the islands in the northern part of the lake. With the addition of the enclosed gill net boat (the "Kokanee") the netters are able to net more effectively in adverse weather conditions. This allows us to maintain netting effort through the winter months. Past efforts have shown that catch rates on juvenile lake trout are high in late November and in February, so in 2010 we netted through mid-December and plan to resume in mid-January of 2011. If this netting schedule proves to be effective, we'll continue to shift netting activity to the "off season" thus minimizing conflicts with the peak angling season. In 2010, over 17,000 lake trout were removed, bringing the total since 2006 to over 57,000 fish.

As many anglers have noticed, the use of trapnets was scaled back in 2010. No trapnets were used in the spring, and we've pared down the fall effort to the most productive six trapnets sites. This is in response to their declining effectiveness. Trapnets are mainly effective on larger (over 22 inch) lake trout, so as the adult lake trout population continues to decline, catch rates are expected to decline as well. That, in fact, has happened, with mean catch declining from 4.1 (fish/net/night) in 2007 to 1.2 in 2010. Though not as effective as they were three and four years ago, trapnets still play an important role in the effort. By setting them in standard locations each fall, we can continue to compare catch rates from year to year and gage the effectiveness of removal efforts.

## Rainbow Trout

Anglers reported better fishing for rainbows and this was reflected by totals from the Angler Incentive Program. In 2010, anglers removed 8,357 rainbows, which was the highest annual total since the program started in 2006. That brings the total rainbow harvest to 32,954 over the past five years.

Thanks to the help of many anglers, we started a tagging study this year that will allow us to get an updated population estimate and evaluate harvest rate. We used different tags this year, called coded wire tags, that allowed us to tag a wider size range of rainbows. During the spring, we worked with anglers (especially during the Spring Derby) to tag fish they caught. This turned out to be a very effective method. We tagged 295 rainbows that were caught by 47 different anglers. Combined with fish our crews collected, we tagged 322 rainbows in all. Tags were implanted in the heads of rainbows (invisible to the eye) and estimates are made based on how many tags are found in heads turned in to the AIP throughout the year. This recapture period will run until this coming spring, so be sure and turn your heads in to help us get the best estimate possible!

While the high catch total for rainbows in 2010 might seem impressive, it actually has not effectively reduced the rainbow population. Through the end of 2010, only 16% of the tagged fish had been turned in by anglers. That means we are unlikely to see an annual harvest rate higher than about 25-30% by the time the recapture period ends. This is consistent with past years and tells us that harvest rate is well below the level necessary to reduce the rainbow population (likely >50%). Confirming this, a population estimate generated through the end of 2010 was higher than in 2009. We'll have a final estimate come June, but early indication is that the rainbow population has actually increased in the past year in spite of the AIP program.

Randy Michaels displays his 25 lb 3 oz winning entry in the **HALLOWEEN DERBY**

# Chinook Fishery Evaluation

Land-locked Chinook salmon were first stocked into Coeur d'Alene Lake in 1982 to improve kokanee size (by reducing their numbers), and provide a trophy fishery. Since then the fishery has been managed with both wild (those produced by fish spawning naturally in the Coeur d'Alene and St. Joe rivers), and hatchery Chinook. Balancing the predators (Chinook) and prey (kokanee) has been challenging, and both fisheries have seen ups and downs in the past 30 years.

This past year was a good one for Chinook anglers, with higher catch rates and some of the largest Chinook seen in many years. The winning fish in the annual Big One Derby was over 24 pounds, and several others exceeded 20 pounds. The bigger fish are a direct response to the increased abundance of kokanee and faster Chinook growth rates. As we've known since 1982, the key to a trophy Chinook fishery is an abundant kokanee population.

In recent years we've seen a low proportion of hatchery produced salmon (determined by clipped fins) in the fishery. This is troubling, considering we typically stock 20,000 to 60,000 small salmon. Does this mean our hatchery marks are not sufficiently detectible, or does it mean hatchery fish are not surviving? Hatchery fish certainly survived well in the initial years of the program, but the stocking protocol and strains have changed over the years. Perhaps the most notable change has been a switch from fall stocking in the 1980's to June stocking in the past two decades.

To better understand our stocking program, we began a study two years ago. Beginning in 2009, all hatchery Chinook have their adipose fins removed. Prior to that, we often used pelvic fin clips. Adipose fin-clips are more easily recognized by anglers, and a missing adipose fin does not affect survival of stocked fish. In addition, all hatchery fish now have a coded wire tag (CWT) inserted into their snout. The CWT is only 1/16$^{th}$ of an inch long and is inscribed with a number. From 2009 through 2011 about 20,000 hatchery fish are being stocked. Half of the fish will be stocked in June at about 4". The other half will be stocked in September when they are about 6". Both groups will be stocked at the Mineral Ridge boat ramp so that they can take advantage of the high densities of kokanee fry in this area of the lake.

We are now asking fishermen that catch a fin-clipped Chinook to bring the head to the IDFG Office in Coeur d'Alene. We will remove the CWT and read the number. This will not only tell us in what year the fish was stocked, but whether it was a spring or fall release. Comparing the numbers of Chinook returned from the different stocking dates will allow us to evaluate most effective hatchery release strategy. Hopefully we can improve the survival of stocked fish and ultimately maintain a more consistent fishery.

While we work to refine the hatchery Chinook program, wild Chinook will continue to play an important role in the fishery. To try to predict the number of wild Chinook salmon that will enter the fishery each year we count the number of nests (redds) in the Coeur d'Alene and St. Joe rivers. Past counts have ranged from 14 to 157 redds. This year the count was 134 redds.

Most years we limit the number of redds to 100 to control the population, however all 134 redds were left undisturbed this year. We concluded the additional redds were acceptable given the abundant kokanee population. Whether or not this will increase the number of wild Chinook in the lake remains to be seen. Winter conditions, spring floods, and the number of salmon that migrate downstream from the lake, are all factors that affect the number of wild Chinook left in the lake.

**Dan Rife's 24.3 pound derby winning Chinook caught in August.**

# Kokanee Populations Promising

Anglers hoping to see more kokanee in Coeur d'Alene and Spirit lakes got their wish in 2010. We surveyed both of these lakes with mid-water trawl and hydroacoustics and found healthy kokanee populations in both of them. That should make this coming year a good one for kokanee fishermen, and it bodes well for Chinook in Coeur d'Alene Lake.

The turn-around in kokanee in Coeur d'Alene Lake has been dramatic. Kokanee abundance was dangerously low between 2006 and 2008 due to a combination of factors, including high spring runoff and excessive predation. The result was a density of about 1.2 adult (three-year-old) kokanee per acre of water, which is very low for a kokanee population. Fishermen had trouble finding fish during the summer when the kokanee were spread out. Because of the low numbers, we had to close the fishery to protect spawning adults in some years.

The population improved in 2009, when we estimated about 14 adult kokanee per acre. This past fall it was even better with adult kokanee densities of about 21 per acre, or a total of just over a half million adult fish. We also estimated there were 1.6 million two year old kokanee that will be adults this year. The high densities combined with the increased limit of 15 kokanee/angler/day, should make for a good kokanee fishery in 2011.

Kokanee size is another concern. As numbers go up, the size of kokanee goes down. Every December we gillnet a sample of spawning kokanee to monitor their sizes. This year, several grade school children helped us pick fish out of our net and measure them. The average size of the adult kokanee was 10.5 inches—that is smaller than the last few years but pretty typical for a northern Idaho kokanee, and right on target.

Spirit Lake is also expected to provide good numbers of kokanee in 2011. Our netting yielded estimates of 43 adult kokanee per acre. Though those fish have now spawned and died, the younger (age-2) kokanee that will be the fishery this winter and during the summer of 2011 were estimated at 62 kokanee/acre, which should make for a great fishery in 2011.

# Rehabilitation and Restoration Projects

## *Porcupine Lake Rehabilitation*

Porcupine Lake is a picturesque mountain lake in the Lighting Creek drainage north of Clark Fork, Idaho. For many anglers the lake has been a secluded get away for a unique angling experience. Unfortunately, from a native fish standpoint, Porcupine Lake was home to brook trout, which pose a risk to the drainage's native cutthroat and bull trout. Non-native brook trout, although fun to catch and excellent to eat, can impact westslope cutthroat and bull trout populations through competition and predation. An additional risk to bull trout is hybridization.

***Maintaining angling opportunities in places like Porcupine Lake is a very high priority for Idaho Fish and Game***

**Rotenone, an organic piscicide, is applied to Porcupine Lake to remove the non-native brook trout and improve conditions for native cutthroat and bull trout.**

Brook trout were likely introduced to Porcupine Lake in the early to mid 1900's. Porcupine Lake's brook trout not only created conflicts with native fish in Porcupine Creek downstream of the lake, but also acted as a source for distribution of brook trout to other locations in the Lightning Creek drainage.

In an effort to conserve native fish in the Lightning Creek drainage for years to come, the Idaho Fish and Game completed a rehabilitation of Porcupine Lake in August of 2010. Rehabilitation included removal of all the fish from Porcupine Lake and a short section of Porcupine Creek using rotenone, a naturally derived chemical commonly used to remove undesired fish populations. This rehabilitation project is expected to eliminate this source of brook trout from further production and distribution to other areas throughout the drainage.

Maintaining angling opportunities in places like Porcupine Lake is a very high priority for the Idaho Fish and Game. To restore the Porcupine Lake fishery, westslope cutthroat trout will be stocked in the lake beginning in 2011.

## *Fish Passage Improvement*


It seems obvious to say that there won't be good numbers of big trout if we don't have a steady supply of little trout. This is the situation we are trying to avoid on the Kootenai River near Bonners Ferry. The adult rainbow trout in the river run up the small tributary streams during the spring to spawn and create the next generation. Many of the small streams, however, have man-made barriers that block fish migrations to prime spawning areas.


Highway 95 culvert on Twenty Mile Creek. Rocks in the foreground are one of three "steps" placed to help fish gain access to the culvert.

In a joint project with the Natural Resource Conservation Service, we have been working on removing these barriers. This past summer three rocks structures were built in Twenty Mile Creek just below the culvert under Highway 95. These structures raised the stream bed about 1.5 feet so that fish would not need to jump into the concrete culvert. Now fish can swim directly into the fish ladder that exists on the southern side of the culvert (the right side). These rock structures also make it possible for small trout to migrate upstream during summer if they are looking for cooler water.

A second project has been planned for Browns Creek. At this location, a culvert under the Union Pacific Railroad tracks creates about a one foot jump and then fish need to swim up through a steeply inclined culvert. The Natural Resource Conservation Service's engineer developed construction plans for this site. These plans include rock structures to raise the surface of the stream to the lip of the culvert and to place a series of steel baffles in the culvert to create pools for migrating fish. Work on this project is expected to begin this summer.

# Biologists Monitor Juvenile Bull Trout Populations

Bull trout (historically called Dolly Varden or dollies) remain a species of special focus in the Idaho Panhandle. Bull trout have been listed as "threatened" by the U.S. Fish and Wildlife Service under the Endangered Species Act in Idaho and across the western U.S. since 1999. For many years, IDFG has monitored bull trout populations by tracking numbers of adult spawning fish by counting spawning nests, or "redds". In 2010, redd counts were completed in over 50 streams associated with Lake Pend Oreille, St. Joe River, Kootenai River, and Little North Fork of the Clearwater River. Redd count trends or the direction of counts over time (2001-2010) indicated bull trout populations remain relatively stable in most drainages, despite reduced counts in some areas.

Monitoring juvenile bull trout abundance in rearing streams is another way to keep track of how these fish are doing. As part of the Avista funded mitigation program in the Clark Fork drainage, we have recently been conducting electrofishing surveys to collect, count, and estimate abundance of juvenile bull trout and other fishes in rearing streams in the Pend Oreille and Clark Fork tributaries. Results from these surveys in tributary streams in 2009 and 2010 indicated bull trout abundance varies widely between streams and ranged from no bull trout present to densities of over four fish per 100 square meters of water (Table 1).

Table 1. Average density of fish per 100 square meters by stream and species for selected Lake Pend Oreille/Lower Clark Fork tributaries.

| STREAM | Bull Trout | Brook Trout | Mountain Whitefish | Rainbow Trout | Westslope Cutthroat | Cutthroat Rainbow Hybrids |
|---|---|---|---|---|---|---|
| GROUSE CR. | 3.5 | 0.4 | 0.6 | 8.2 | 3.6 | 0.3 |
| N.F. GROUSE CR. | 0.0 | 4.1 | | 5.0 | 5.9 | 0.3 |
| RAPID LIGHTNING | 0.0 | 3.2 | 1.2 | 1.0 | 5.2 | 0.3 |
| GOLD CR. | 4.4 | 0.0 | | 0.0 | 23.6 | 0.0 |
| GRANITE CR. | 4.6 | 0.0 | 0.2 | 0.0 | 6.7 | 0.0 |
| JOHNSON CR. | 1.4 | 0.0 | | 0.0 | 5.1 | 0.0 |
| STRONG CR. | 0.0 | 0.0 | | 0.0 | 7.1 | 0.0 |
| TWIN CR. | 0.0 | 2.7 | | 2.0 | 3.8 | 0.0 |
| W. GOLD CR. | 0.1 | 0.0 | | 0.0 | 43.7 | 0.0 |

Westslope cutthroat, another native fish, were generally the most abundant fish in most of these tributaries with average densities of 3.6 to over 43 fish per 100 square meters of water. Non-native rainbow trout were the most abundant fish in the Grouse Creek drainage. Comparing cutthroat and bull trout estimates at selected sites with those from past years indicates abundance has remained relatively stable over the last decade in some streams such as Gold Creek (Figure 1). In contrast, others such as Twin Creek have experienced greater variation from year to year. The more variable fish abundances in this example likely reflect habitat conditions in the respective streams.

Monitoring bull trout populations and understanding how they interact with other species is important, but not just to understand how many fish are out there. Monitoring results also help by directing restoration efforts to improve fish populations where problems with poor habitat or conflicts with non-native species may exist. Brook trout suppression in Keokee Creek, a tributary of the Priest River drainage, is one example of a restoration effort that resulted from previous tributary monitoring. Brook trout expansion into Keokee Creek was first documented in 2000, raising concerns about potential impacts to cutthroat and bull trout through hybridization and competition. Following their discovery, brook trout were mechanically removed from 2005 through 2007 in an attempt to eliminate them from the stream and enhance native fish populations. In 2010, only one brook trout was found remaining in this stream reach, creating opportunities for native fishes to expand.

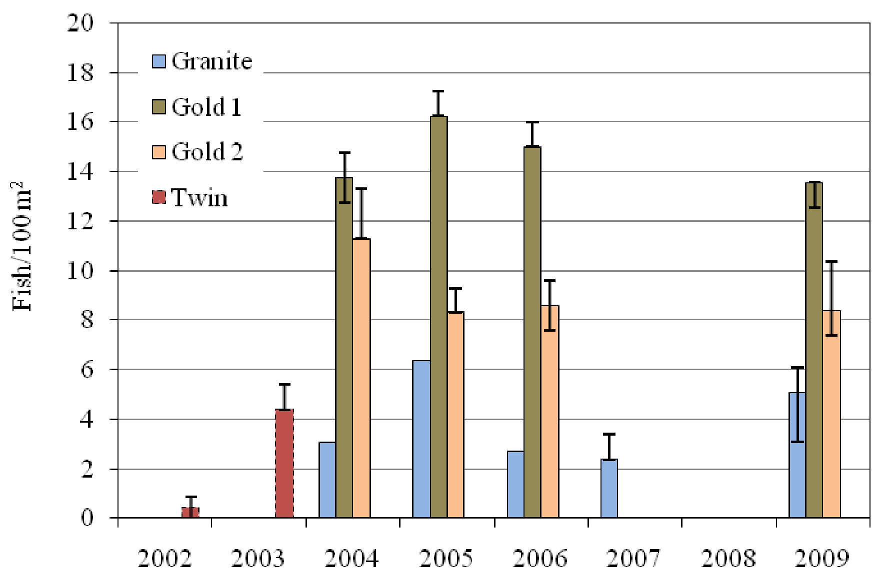



Figure1. Estimated density and associated 95% confidence bounds of bull trout at repeated survey sites on selected Lake Pend Oreille tributaries .

# Pend Oreille River Fishery Assessment

## *2010 Survey Reflects Changes in Fishery in Past Two Decades*

Historically, the Pend Oreille River, Idaho, provided a fishery for native salmonids including cutthroat trout, bull trout and mountain whitefish. After construction of the Albeni Falls Dam in 1952, the free-flowing river changed to a reservoir for much of the year. Annual fluctuations in water level of 7-12 feet results in degraded habitat and loss of riparian vegetation. The warmer water created by the inundation of the river and adjoining backwaters in the spring and summer limits use of the river by the native salmonids, while favoring warmwater fish such as largemouth and smallmouth bass, black crappie, and yellow perch.

Unfortunately, much of the low-velocity backwater habitat, important to warmwater fish, disappears with the annual drawdown. The result is a system where coldwater fish are limited by warm water in the summer, whereas warmwater fish are limited by suitable backwater habitat in winter. Despite these limitations, the Pend Oreille River supports an increasingly popular fishery.

Mark Liter displays representative largemouth (left) and smallmouth (right) bass from the Pend Oreille River.

In June we conducted an extensive electrofishing survey, duplicating surveys that were completed in 2005 and in 1991-92. The objectives of this study were twofold. The first was to evaluate how the fish community has changed over the past two decades and hopefully gain a better understanding of how fish populations are affected by changing habitat conditions. The second objective was to evaluate smallmouth and largemouth bass abundance, size structure, and angler harvest rates.

### Species Composition

Fifty 400 yard-long transects were randomly selected from the 27 miles of river between the long bridge and Albeni Falls Dam. Fish were sampled from three different shoreline habitat types (sand, rock, sloughs) using boat-mounted electrofishing units. Two netters collected all sizes and species of fish. Captured fish were placed in a live well and then identified to species, measured for total length, weighed and released alive.

The survey reflected some interesting changes in species composition over the past 20 years, particularly with smallmouth bass and walleye. In a 1992-93 survey over 50,000 fish were collected. Interestingly, no walleye and only one smallmouth bass were captured. In 2005, six walleye were captured, and by 2010, that number increased to 22. Similarly, smallmouth went from being virtually non-existent in the 1991-92 sample to where they now represent 19% of the fish community.

Species composition (%) of fish captured during electrofishing surveys of the Pend Oreille River from 1991-92 through 2010.

| Species | 2010 | 2005 | 1991-92 |
|---|---|---|---|
| Largemouth bass | 8.8 | 5.1 | 8.4 |
| Smallmouth bass | 19 | 6.7 | 0 |
| Yellow perch | 10.7 | 17.4 | 14.7 |
| Black crappie | 3.7 | 23.7 | 1.7 |
| Pumpkinseed | 4.4 | 19 | 11.7 |
| Walleye | 1 | <1 | 0 |
| Brown trout | 3.4 | <1 | <1 |
| Cutthroat trout | 1.3 | <1 | <1 |
| Northern pikeminnow | 5.2 | 12.6 | 22.2 |
| Largescale sucker | 5.2 | 4.4 | 10 |
| Brown bullhead | 4.6 | 2.7 | 5.5 |
| Peamouth chub | 28 | 4.2 | 3.7 |

### Bass Harvest Rates

In addition, we tagged and released over 200 bass. Largemouth and smallmouth bass were initially collected and marked June 1-3. To estimate the population, a second "recapture" effort was conducted June 7-8, allowing the fish time to redistribute throughout the river system. All bass over 12 inches were marked with T-bar tags inserted below the dorsal fin. The tags were labeled with an individual number and a toll-free telephone number. IDFG operates a toll free automated hotline and website through which anglers can report tags. Anglers who caught tagged largemouth bass were encouraged by signs and posters to report the date, location, and if the fish was released or harvested.

By the end of December, 22 tags had been reported by Pend Oreille River anglers. Over 2/3 of the tagged largemouth bass that were reported were released. The majority of harvested bass came from the backwater sloughs in June, coinciding with spawning season, when bass aggressively protect their shallow water nests.

Based on the number of tags reported and the percent of those harvested, we estimated the exploitation (or harvest rate) of bass was only around 5%, though our estimate did not include the harvest that would have occurred prior to mid-June, when our survey began. The relatively low exploitation rates are largely due to a change in management in the Pend Oreille River in recent years. In 2006 the regulations allowed a harvest of six bass in the Pend Oreille River with a 12-inch minimum size. That year, we conducted a similar study and found largemouth bass harvest rates were between 26% and 43%—enough to limit the number of large bass in the population.

Anglers supported a shift to quality management in 2008, which only allows two largemouth bass with none under 16 inches. The quality rule was not applied to the sloughs, however. Allowing liberal harvest at the time when largemouth bass are most vulnerable limited the effectiveness of the quality rule. For that reason, in 2011 the quality largemouth bass rule has been extended to include the sloughs.

# Sturgeon Population and Spawning Behavior in the Kootenai River

Adult sturgeon captured while set-lining in the Kootenai River, 2010.

Since 1991, the U.S. Army Corps of Engineers has provided discharges from Libby dam in an attempt to stimulate white sturgeon spawning and recruitment. One of our main tasks each year is to evaluate the effects of these discharges on adult sturgeon movement and behavior. Every spring, we implant sonic transmitters in adult sturgeon and monitor their movements using an array of fixed sonic receivers throughout the river corridor. In 2010, we tagged 36 sturgeon (28 females). All of them migrated upriver as far as lower Shorty's Island, an d seven migrated just above Bonners Ferry. Only one of sturgeon was recorded further upstream in the area referred to as the "braided reach".

Substrate conditions in the braided reach presently appear to be more favorable for successful reproduction. For this reason, determining the discharge and temp e r a t u r e conditions that maximize m o v e m e n t s into the braided reach is a high priority. The Kootenai Tribe of Idaho (KTOI) is spearheading a habitat enhancement project with one objective being to increase movement of adult sturgeon into and above the braided reach.

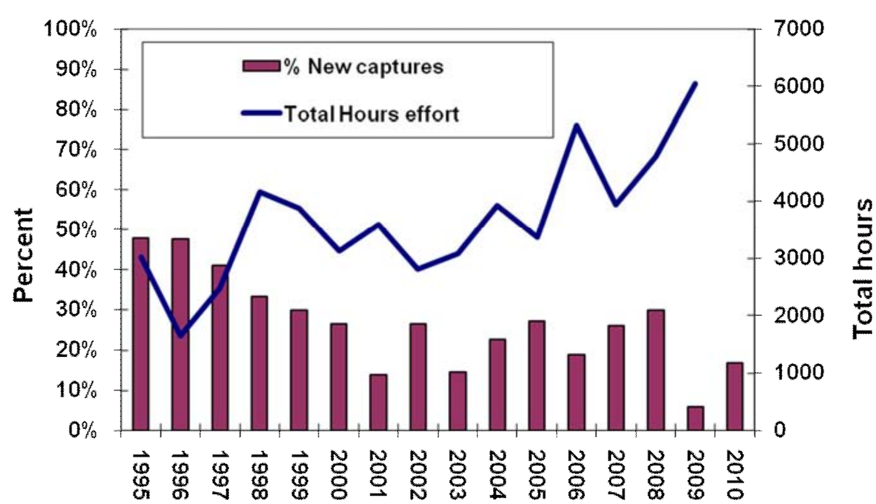
*One of our main tasks each year is to evaluate the effects of Libby Dam discharges on adult sturgeon movement and behavior*

Spawning downstream of Bonners Ferry has been documented each year since this investigation began. Despite the fact that several late stage fertilized eggs were collected near Bonners Ferry in 2010, successful recruitment beyond the egg stage has not occurred since at least the early 1970's. To better understand how substrate and flow affect post-hatch survival, beginning in 2008 we initiated a release of one to four day old embryos. In 2010, over a million embryos were released at seven sites above Bonners Ferry in Idaho and Montana. We sampled below the release sites with plankton nets to document drift and any subsequent survival of embryos and larvae. However, no sturgeon embryos or larvae were collected in 2010, although several hundred non-target larvae were collected. This is a long term project and will be continued for at least two more years.

Because of the difficulty of collecting drifting larvae in the main channel of the Kootenai River during spring flows, the best way to determine the effectiveness of the embryo releases may be to use gill nets in future years. For several years, gillnetting has been used to evaluate growth, condition, density, distribution and proportion of wild sturgeon in the population.

Beginning in 1990 and continuing to the present, the KTOI hatchery has released over 190,000 juvenile white sturgeon in the Kootenai River. In 2010, we sampled 23 standardized sites in Idaho and Canada and collected over 800 hatchery reared and 6 wild juvenile sturgeon. These six wild juveniles were aged by removing a section of the pectoral fin ray and examining the section under a dissecting microscope. The wild fish ranged from three to 17 years old and represented four different year classes (1993, 1996, 2003, and 2005). White sturgeon in the Kootenai River do not spawn until at least 30 years of age. Although there is some wild recruitment most years, even with low mortality after age-2, the number of wild recruits is currently inadequate for a viable wild spawning population. Habitat enhancement may be the most realistic option for improving spawning success.

Total hours and percentage of new fish captured while set-lining in Idaho and British Columbia, Canada, since 1995, Kootenai River.



# Hayden Lake Fishery Surveyed

Hayden Lake is one of the most economically and recreationally important lakes in northern Idaho. In 2003 an IDFG Sport fishing Economic Report indicated that anglers spent approximately $1.7 million fishing Hayden Lake during an estimated 23,745 fishing trips. With Hayden Lake's close proximity and diverse fisheries, it is easy to understand the attraction the lake presents to the local communities.

Hayden provides fishing opportunities for species such as rainbow and cutthroat trout, smallmouth and largemouth bass, black crappie and northern pike. The popularity of the lake is due, in part, to the remarkable variety; however, such diverse fisheries create levels of complexity that can be challenging for fisheries managers. One of our primary concerns with Hayden Lake is how to maintain or improve trout fishing in the presence of increasing warm water fish populations. Historically, anglers fished the lake primarily targeting trout; however, in recent years anglers have switched their focus to species such as smallmouth and largemouth bass, black crappie, and northern pike.

*What was once a phenomenal trout fishery is now a remarkably diverse (and popular) fishery, but trout are a relatively minor component.*

In order to determine the current condition of fisheries in Hayden Lake, we conducted a year-long creel survey in 2010. Creel surveys use random interviews and counts of anglers to assess hours of use as well as catch and harvest rates of a particular fishery. Anglers were interviewed on the water and at public launches to obtain information such as hours fished, equipment used, species caught, and the number of fish harvested.

During the 2010 creel survey on Hayden Lake, IDFG interviewed over 1,100 anglers from 15 states and Canada, with 88% of anglers being from Idaho. Washington had the second highest number of anglers with 7% of the total. Anglers fished an estimated 73,446 hours on Hayden Lake from February 1 to December 31, 2010 (Table 1). Angling effort has decreased slightly since the last creel survey from 1994-95 when anglers fished an estimated 85,595 hours. The 2010 creel survey on Hayden Lake showed that 21% of the total fishing effort was directed at smallmouth bass, 18% northern pike, 13% trout, 12% largemouth bass, and 7% black crappie.

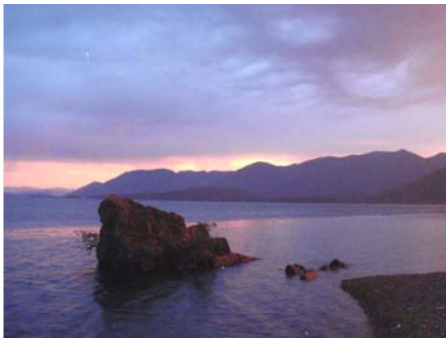
The estimated catch rate in 2010 for all species of fish combined were the highest observed during any Hayden Lake creel survey. Smallmouth bass made up the majority of catch, with anglers catching an estimated 33,946. Interestingly, anglers took home only around 8% of those caught. The species with the second highest catch was largemouth bass with an estimated 12,326 caught and less than 1% being harvested.

Despite annual stocking of over 225,000 rainbow trout fingerlings, catch rates for trout were the lowest ever recorded with an estimated total catch of 147 fish for 2010. These numbers are considerably down from the estimated 2,548 trout caught in 1994-95. Despite the low numbers, trout fishermen reported the fish caught were usually several pounds in weight. The reports of good growth on trout in Hayden Lake are typical and likely related to the abundance of Mysis shrimp in the lake. Mysis shrimp were introduced into Hayden Lake in 1974 to provide forage for kokanee introduced in 1975 and 1976. Although kokanee failed to establish, Mysis shrimp were abundant by the early 1980s. Stomach samples collected in the late 1980s indicated that over 90% of the trout depended on shrimp for the bulk of their diet. The average density of mysids in Hayden Lake in 2010 (975/m$^2$) was similar to the density in 1988 (1,234/m$^2$), suggesting a fairly stable population.

**Table 1.** Creel survey summary statistics including total effort (angler hours), number of fish caught, and number of fish harvested in 2010 compared with past years.

| | 1979 | | 1982 | | 1994 -95 | | 2010 | |
|---|---|---|---|---|---|---|---|---|
| Effort | 20,788 | | 34,421 | | 85,595 | | 73,017 | |
| Species | Catch | Harvest | Catch | Harvest | Catch | Harvest | Catch | Harvest |
| All trout | -- | 468 | 4,261 | 1,389 | 4,258 | 1,941 | 147 | 93 |
| Largemouth bass | -- | -- | 64 | 53 | 6,088 | 180 | 12,326 | 62 |
| Smallmouth bass | -- | -- | -- | -- | 16,034 | 313 | 33,946 | 2,610 |
| Crappie | -- | -- | 1,879 | 1,876 | 4,971 | 1,462 | 7,202 | 2,297 |
| Perch | -- | -- | 4,576 | 4,377 | -- | 4,744 | 5,052 | 938 |
| Northern pike | -- | -- | -- | -- | -- | 1,919 | 2,093 | 476 |
| Other | -- | -- | -- | -- | 20,386 | 312 | 3,030 | 150 |
| Total | -- | 468 | 10,780 | 7,695 | 51,737 | 10,871 | 63,796 | 6,626 |
| Catch rate trout(fish/h | -- | 0.05 | 0.33 | 0.11 | 0.06 | 0.02 | 0.002 | 0.001 |
| Catch rate all (fish/h) | -- | -- | 0.83 | 0.70 | 0.61 | 0.13 | 0.87 | 0.09 |

Several measures have been implemented to improve the trout fishery in Hayden Lake. To reduce predation of newly stocked fingerlings, we've moved the stocking location to the south end of the lake, which has lower densities of warm water predators. We're beginning to evaluate other factors such as food density for trout fingerlings, time of planting, and the resilience of the strain of trout stocked. Although the trout fishery of the 1940's and 50's is a thing of the past, we believe we can restore the fishery to the quality anglers enjoyed in the 1970's and 80's. Other options such as stocking kokanee are also being considered, which would not only provide a secondary food source for trout, but also provide an additional open-water fishery for anglers.




### *Acknowledgements:*

*We appreciate the partnerships and support from the many individuals, organizations and agencies that help us to achieve our mission, including:*

*IDFG Volunteers*
*Avista*
*Bonneville Power Administration*
*Bureau of Land Management*
*U.S. Fish and Wildlife Service*
*U.S. Forest Service*
*Coeur d'Alene Tribe*
*Kootenai Tribe of Idaho*
*Kalispel Tribe*
*Rathdrum Parks and Rec.*
*Lake Coeur d'Alene Anglers Assn.*
*Lake Pend Oreille Idaho Club*
*Panhandle Bass Anglers*
*Shoshone Co. Sportsmen Assn.*
*Bonner Co. Sportsmen Assn.*
*Kootenai Valley Sportsmen Assn.*
*North Idaho Flycasters*
*Priest Lake Sportsmen Assn.*
*Idaho Dept. of Lands*
*Idaho Dept. of Water Resources*
*Dept. of Environmental Quality*


## *August 6th Big Day for Record Fish!*

It's not every day that a state record fish is caught, and it's almost unheard of to have two caught in a single day. Who knows whether the stars were lined up just right, or it was just crazy luck, but anglers caught two state record fish in a single day this past summer. The first was a 40 lb 2 oz. northern pike caught out of Lower Twin Lake by Kim Fleming. Interestingly, the angler was using a wedding ring spinner and 6 lb test trolling for trout!! The second fish was a 6 lb 8 oz. lake whitefish from Pend Oreille by Dale Hofmann. This fish had less chance of breaking off, as Mr. Hofmann was trolling for lake trout with a flatfish and 30 lb spiderwire.

## *Pygmy Whitefish Hanging on in Upper Priest Lake*

The state record lake whitefish was exciting, but there was some other exciting (at least to us) work on a small relative of the lake whitefish. During 2010, Idaho Fish and Game made its first ever attempt to quantify the population of Pygmy Whitefish in Upper Priest Lake. Unlike lake whitefish, pygmy whitefish are native to Idaho. They have been found in Priest Lake, Upper Priest Lake, Spirit Lake, and Lake Pend Oreille. As the name implies they are a small fish; a large one is about 6" long. They typically live in deep water near the lake's bottom so they often go unseen. Upper Priest Lake contains a strong population of rather predatory lake trout so it was of interest to quantify whitefish abundance.

We conducted two hydroacoustic surveys during the summer of 2009 that crisscrossed the lake. Both surveys were conducted at night. We recorded average densities of about 140 fish/acre that were in the 1" to 6" size range with a few larger fish. These fish were mostly near the bottom in the center part of the lake at depths over 60 feet. Unfortunately, the echosounder cannot identify the species of the fish.

To determine species composition, we used a bottom trawl to collect fish in August. Tows near the center of the lake caught around 40-60 pygmy whitefish per haul, along with a few small lake trout and slimy sculpins. Based on the finding that 95% of these deep fish were pygmy whitefish, we calculated the lake contained over 150,000 whitefish. Ages of these fish ranged from 2 to 6 years old based on microscopic examination of their otoliths (an ear bone). Though we don't know how this estimate compares to historical abundance, the results are encouraging, in that they demonstrate this unique native fish population appears to be in good shape.

## Student Activities

IDFG fisheries staff fully recognize the importance of exposing young people to fish and wildlife and related activities. Every year we organize or participate in events such as Free Fishing Day, hunting clinics, or the Kid's Bluegill Clinic (*page 1*). Our hope is that these programs provide opportunities for kids that might otherwise not be exposed to fishing or hunting activities. In addition, we participate in school-related activities, such as the Bonner County Water Festival, Trout in the Classroom, and school visits.

We continued our youth involvement efforts in 2010 with visits to classrooms around the region where we gave students hands-on Ichthyology lessons and talked about fishery science. In addition, we had students join us in the field to tour the Pend Oreille netting operation, and help pull kokanee nets in Coeur d'Alene.

**Students get hands-on experience gillnetting kokanee at Higgens Point in December.**

**Ryan Hardy shows Avery students how different fish are specially adapted for their environment.**