



Photo: Ryan Hardy

Panhandle Region Annual Fisheries Report



2009 Activities and Accomplishments

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Issue 1

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Greetings...and thanks for your interest in the second annual Panhandle Fisheries Newsletter. The intent is to provide a brief summary of the fisheries research and management activities to help folks better understand our fishery resources and know what IDFG is doing to manage them.

This newsletter will be 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 particularly interesting (in our opinion) information, please send a request to jim.fredericks@idfg.idaho.gov and we'll get you added.

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Cabinet Gorge Hatchery Takes over Eight million Kokanee Eggs

Those who've been tracking the progress of the Pend Oreille Fishery Recovery Effort (following page) know that one of the key measures of success of the program is kokanee survival. Despite having ample numbers of juvenile kokanee for the past several years, an overabundance of predators has resulted in very poor survival to adulthood. The poor survival has led to some very poor spawner returns to the Sullivan Springs Kokanee trap on the east side of the lake.

The Cabinet Gorge Hatchery has the capacity to raise nearly 20 million kokanee from eggs taken at Sullivan Springs for release back into Pend Oreille. Though the average egg-take since the hatchery came on line is closer to half that, it reached new lows in 2007 and 2008, when less than a million eggs were taken between *both* years. Fortunately, we were able to supplement those weak years with eggs from other sources.

This year, we saw a far more encouraging return, with the crew taking over 8.25 million eggs! In total, 52,000 spawners returned to the trap. About 10% of those were released upstream to spawn on their own in the Sullivan Springs Channel,



The Cabinet Gorge Hatchery crew traps and spawns kokanee every fall at Sullivan Springs.

with the rest being spawned by the crew. At 300-400 eggs per female, that's a lot of fish squeezing.

Though the hatchery is not the key to recovery of the Pend Oreille fishery, it represents one very important component, so this year's return made a nice Christmas present. We're not out of the woods yet (we still have two weak age-classes of kokanee in the population) but together with lake level management to maintain the wild shoreline spawning component and the predator reduction efforts, we're very encouraged by the way the kokanee population has responded. (For more on that, turn the page.....)

Pend Oreille Fishery Recovery Effort Paying Off

Kokanee Responding to Predator Reduction and Lake Level Management



Predator Removal —The Pend Oreille netting program had another successful and effective year in 2009. The Harbor Fisheries contractors netted lake trout from March through early June, and again from September through mid-November, for a total of 26 weeks. They removed a total of 17,231 lake trout, which is the highest annual total to date.

In September and October the netters targeted spawning adults, using sonic-tagged “judas” lake trout to guide their efforts. This, once again, proved highly successful, with

the crew removing an estimated 39% of the entire spawning population in two months. As the lake trout size structure has changed in response to the Angler Incentive Program (AIP) and netting efforts over the past three years, the netters have refined their net size and technique to maximize their effectiveness on the small fish and minimize bycatch of lake whitefish, bull trout, and other non-target species. This adaptive strategy has greatly increased their ability to remove juvenile lake trout. Over 15,000 juvenile lake trout (6-14 inches) were removed in 2009.

Anglers have continued to play an important role in the predator reduction efforts. Through the Avista funded AIP anglers are paid \$15 for rainbow and lake trout harvested from Pend Oreille. Anglers turned in over 7,200 lake trout and nearly 6,000 rainbow trout in 2009. Lake trout harvest was a little over half of that in 2008 (likely reflecting the reduced lake trout population). Rainbow harvest increased from 2008 as declining lake trout catch rates had anglers focusing more on rainbows.

“Bonus” Added to Incentive Program

In light of the need to increase rainbow trout harvest, last spring we began a program to provide an additional harvest incentive. Nearly 100 microchip (PIT) tags were implanted in the heads of rainbow trout. The tags have been assigned a dollar value ranging from \$50 to \$1,000. All heads turned into the AIP are being scanned for the tags, and anglers turning in tagged heads will be mailed a check for the assigned value in addition to the \$15 standard reward. To date some 20 tags have been turned in, including four worth \$500 and one worth \$1,000.

the predator population is becoming increasingly evident. In 2007, anglers removed around 17,000 lake trout compared to around 6,000 removed by the netters. In 2009, we see nearly the inverse, with the netting program removing around 17,000 lake trout and anglers removing around 6,700. As lake trout size and abundance continue to decline, netting will play an increasingly vital role. However, netting does NOT remove a significant number of rainbow trout. We rely solely on anglers to achieve that objective. Kokanee population modeling indicates that even if the lake trout population is controlled, an abundant rainbow trout population can slow or prevent kokanee recovery, so continuing to encourage anglers to harvest rainbow trout is critical (see inset).

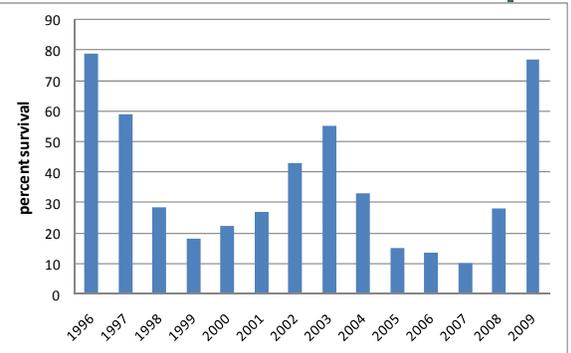
Survival of juvenile kokanee was over 75%, which is the best we've seen in 13 years

Lake Levels —Though many may think of the Pend Oreille Fishery Recovery effort as being all about the commercial netting and harvest reward programs, the current effort goes back to research in the early 1990's that demonstrated a full 11.5-foot winter drawdown on Pend Oreille left the best kokanee spawning gravel high and dry. It was believed that the loss of those important spawning gravels was a big reason the kokanee population had been in decline since the 1960's. Beginning in 1996, the lake was maintained at a higher level on an experimental basis and the kokanee egg-to-fry survival rates were measured. After several years, the benefit was evident. Egg-to-fry survival rates more than doubled when the lake was held at the higher elevation.

As a result of the research and the importance of kokanee to the Pend Oreille bull trout population, the U.S. Army Corps has kept the lake at a higher level (7.5-foot drawdown) the majority of years since 1996. The decision on extent of drawdown is based on several factors including precipitation forecast, previous year elevation, and the number of wild kokanee spawners expected to use the shoreline. Periodically lowering the lake can actually benefit kokanee by allowing winter wave activity to redistribute and clean the shoreline gravels, as is the case this year. IDFG will continue to work with BPA and the Corps to insure this valuable element of the kokanee recovery effort continues.

Kokanee Response —One thing nearly all Pend Oreille anglers agree on is that kokanee are the key to restoring a healthy fishery. Not only do they provide a popular fishery, they are the foundation for the world famous trophy rainbow fishery as well. So everyone ought to be pretty excited to see the kokanee population is showing some very positive signs. Spawner numbers were about 10-fold higher than last year (see p. 1) and survival of age-1 to age-2 kokanee has increased from 10% two years ago to over 75% this year. Unfortunately survival rates are only part of the story. We still have a relatively weak year-class of age-1 kokanee, and have been below objective for spawners, so maximizing survival will be extremely important for the next three to four years.

Although the results to date are very encouraging, we have to resist the temptation to declare victory and begin rebuilding the rainbow population prematurely. Excessive predation on a weak age-class could set the entire recovery effort back several years, so we need to be encouraged.....but patient.



Survival of kokanee from age-1 to age-2 on Pend Oreille Lake since 1996.

Lake Pend Oreille Bull Trout Show Widespread Improvement



Photo: Daniel Jolibois

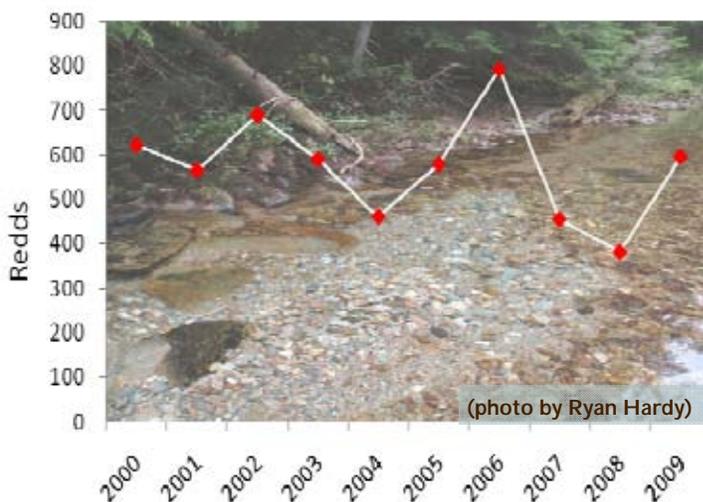
Lake Pend Oreille supports one of the largest and most robust populations of bull trout in the intermountain west. IDFG and agency partners annually monitor bull trout abundance around the region. Unlike many fish monitoring programs, the population isn't tracked by counting fish. Instead, bull trout populations are monitored indirectly by counting bull trout redds (nests) left behind in streams by spawning adults. Redds are areas of stream gravels where eggs are deposited and covered leaving a cleaned depression that can then be counted by walking streams and visually identifying them. This method is an effective gauge of the total population because all bull trout in Pend Oreille are "adfluvial" meaning they live in the lake, but spawn in tributary streams.

In 2009, a total count of 866 redds was made over 22 different streams around Lake Pend Oreille. The average count from the previous 10 years was 809 redds (see figure). The 2009 counts represent a positive increase from the previous two years. Also of great importance, we found many of the streams that traditionally have only a few bull trout spawners (e.g., Strong, Porcupine, and Wellington creeks) remained stable or increased in 2009. Maintaining these weaker stocks is important to the genetic health of the overall bull trout population.

The 2009 monitoring results are a good indication efforts to improve numbers of bull trout in Lake Pend Oreille are working. The IDFG in cooperation with Avista, other agencies, local groups, businesses, and individuals is working on projects that enhance conditions for bull trout by restoring habitat, protecting nursery streams through conservation easements, and removing barriers that stop bull trout from getting to prime spawning areas (see article on fish habitat improvements).

Anyone who's fished for lake trout in Pend Oreille has likely found they have a high degree of habitat overlap with bull trout. The overlap is one reason the two species are not compatible over the long term. A primary goal of the predator reduction program on Lake Pend Oreille is to protect and restore the lake environment for bull trout by increasing bull trout prey (kokanee) and reducing competition for food with non-native lake trout.

The overlapping habitat means some level of bull trout bycatch in gillnets and trap nets is unavoidable. A key component of the netting program is minimizing the number of bull trout captured in the nets while maximizing lake trout catch. Since the program began, the netters have continually worked with IDFG biologists to analyze bull trout and lake trout catch rates as related to net locations, depths, dates, and mesh sizes, all to maximize the lake trout to bull trout catch ratio. In addition, nets are rarely set for more than a few hours to minimize bull trout mortality. Though these efforts have greatly minimized bull trout bycatch and mortality, 1,176 bull trout were captured incidentally in the netting program in 2009, with 306 of those being mortalities. Though any bycatch mortality is unfortunate, it's important to look at the impacts to bull trout on a population level. After four years of aggressive lake trout netting, the evidence suggests the netting program is not hurting the bull trout population. To the contrary, bull trout monitoring indicates the netting program is among the many efforts underway that are helping to improve the Pend Oreille bull trout population.



Long term (10 Yr) trends in bull trout redd counts on index streams around Lake Pend Oreille .

Porcupine Lake Renovation to Benefit Bull Trout, Anglers

Non-native brook trout can be fun to catch and are great eating, but they pose a significant risk to western trout species, such as cutthroat and bull trout, in many areas where they've been introduced. One such area is Porcupine Lake, which sits at the head end of Porcupine Creek, an important nursery stream for cutthroat and bull trout in the Lightning Creek drainage. Brook trout not only create problems in Porcupine Creek, they can also disperse to other locations in the drainage. Surveys in 2008 and 2009 indicated brook trout are likely coming from the headwaters of Porcupine Creek and Porcupine Lake. To help protect native fish in the drainage the IDFG is planning to use rotenone to remove brook trout in the lake and upper Porcupine Creek in the coming years.

This action will not only benefit native trout, it will benefit anglers as well. Porcupine Lake has a long history as a recreational fishery. Because brook trout in Porcupine Lake didn't provide a consistent fishery, IDFG has stocked catchable-size rainbow trout for decades. Recently, however, the access road was converted to a trail, so stocking larger trout with a truck is no longer an option. Instead, we'll use 2-3 inch cutthroat trout fry, as we do with many other mountain lakes. One thing we've learned from other lakes is that fry stocking won't be successful in a lake full of hungry brook trout. Once brook trout have been eliminated, we'll be able to rebuild and maintain a quality cutthroat trout fishery.

Coeur d'Alene Lake Fishery Surveyed

Coeur d'Alene Lake is one of Idaho's most heavily used fisheries. In 2003 an IDFG economic survey indicated anglers spent approximately \$6.7 million fishing Coeur d'Alene Lake, making it an extremely valuable fishery both in terms of recreation and impacts to the local economy. Chinook salmon are the trophy species, with kokanee being the "bread and butter" fish. Increasingly, warm and cool water fish, such as largemouth and smallmouth bass and northern pike have become a major part of the fishery.

Creel Survey Helps Understand Fishery

There are several types of surveys that help us understand a fishery. Many (most in this newsletter) focus on fish population assessment. However, assessing angler use, catch rates, and harvest can be equally as important. Unfortunately, these surveys, known as "creel surveys" are costly, so we typically only conduct them every 5-10 years on important fisheries. The last creel survey on Coeur d'Alene Lake was completed in 1996. IDFG partnered with the Coeur d'Alene Tribal Fisheries Program to conduct a year-long survey in 2009 of Coeur d'Alene Lake and the lateral lakes. Boats and anglers were counted from an airplane at randomly selected times throughout the week. Anglers were interviewed at boat ramps or on the water to provide information such as hours fished, type of equipment used, species caught, and the number harvested.



An angler with a nice Coeur d'Alene Lake Chinook.

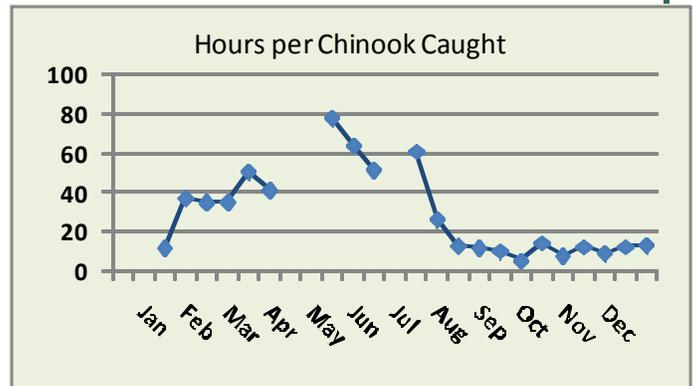
Over 2,600 anglers from 19 states and Canada were interviewed in 2009, with 83% being from Idaho. Washington had the second most number of anglers, with 13% of the total. Anglers fished an estimated 95,000 hours on Coeur d'Alene Lake and an additional 56,000 hours on the chain lakes from January 1 to December 31. Of the Coeur d'Alene Lake effort, 34% was in the northern section (north of Arrow Point), 52% was in the middle section (Arrow Point to tribal boundary), and 14% was in the tribal waters.

Forty-two percent of the total fishing effort was directed toward Chinook salmon and 35% towards kokanee. Twelve percent was directed towards northern pike, 6% towards large-mouth bass, and 3% towards small-mouth bass.

Anglers caught an estimated 877 Chinook and harvested 729 of them. Harvested Chinook ranged from 14 to 35 inches, with an average of 23 inches. Chinook catch rates were best from late August through December, when anglers caught a Chinook for every 5 to 15 rod hours, and slowest in June-July, when an average of 60-80 rod hours was spent on each fish (see Figure). Anglers caught an estimated 8841 kokanee and harvested 6770 for catch rates of .68 fish/hour and .52 fish/hour respectively.

Chinook/kokanee Populations Coming back into Balance

So what is the latest on kokanee? For more than a decade, adult kokanee have been well below our desired levels of about 12 to 24 adult kokanee per acre of water. For the past three years, we had about 1.2 adult kokanee per acre. These low densities made it difficult for anglers to find the adult fish and kept catch rates low. The kokanee grew large, but the low numbers impacted



Average number of rod hours spent for each Chinook caught during the two-week sampling intervals of the 2009 creel survey.

the kokanee fishery and forced emergency closures to protect spawning adults. Chinook growth was also affected by the low kokanee densities (their main food source), with few mature fish exceeding 15 pounds. Chinook stocking was greatly reduced and the limit was liberalized to help reduce predation on kokanee and allow the population to recover.

As hoped, we saw a significant rebound in the kokanee population in 2009. Adult densities have increased ten-fold to 12 adults per acre of water. This puts them right at the lower end of our desired range. One and two year old kokanee have also rebounded to levels not seen since before the mid-1990s. With this improvement, we kept the kokanee fishery open this fall for the first time in three years, and resumed stocking Chinook salmon.

The one low year class is kokanee fry. We estimated the lake contained only 3.6 million of them. That may seem like a lot, but it is one of the lowest estimates on record. Why? It seems the low numbers of adult kokanee in 2008 produced very low numbers of fry in 2009. We will be keeping a close watch on this year class and may need to adjust Chinook stocking to accommodate them.

How are the Chinook salmon faring? With the kokanee population increasing, Chinook growth is up as well. Several fish over 20 lbs were taken in 2009. We resumed stocking in 2009 with 20,000 fingerling Chinook. We are in the midst of an effort to refine our stocking program as well. Specifically, we are evaluating June vs. October releases. For the next few years, all hatchery Chinook will be marked with an adipose fin clip and coded-wire-tags (CWT). The tags and clips will give us a much better understanding of the contribution hatchery fish are making to the fishery, and ultimately, make for better fishing.

Habitat Projects Improve Fish Passage

Without good habitat, there's little we can do to manage healthy fish populations. Cool, clean, complex and connected habitats (the "four C's") are critical for maintaining our native fishes like bull trout and westslope cutthroat trout. You've probably heard it before: trout need cold, clean water—but what does complex and connected have to do with habitat? Trout need a variety (complex) of stream features like pools, riffles, woody debris, and undercut banks to make a living. They also need to be able to access (connect) a variety of areas during different times of the year for spawning, rearing, and refuge from harsh temperatures. In 2009, several habitat improvement projects related to habitat connectivity were completed in cooperative efforts around the region.

East Hope Reconnects Strong Creek

The city of East Hope, with input from IDFG and others, finished the reconstruction of the city's water diversion structure on Strong Creek, a tributary to Lake Pend Oreille. The city's prior water diversion structure was impassible to upstream migrating bull trout and westslope cutthroat trout. This precluded access to several miles of good spawning and rearing habitat in upper Strong Creek. A new innovative water diversion structure was constructed in 2009 to replace the old structure. The new sub-surface diversion is a benefit to the city and fish alike.



A new water diversion on Strong Creek provides upstream and downstream fish passage. Screens built into a subsurface concrete structure allow diversion of water for municipal use without diverting fish.

Low Water Barrier Addressed on Gold Creek

On Gold Creek, another Lake Pend Oreille tributary, project cooperators including U.S. Fish and Wildlife Service, Avista, IDFG, and private landowners completed a road obliteration project to remove access to a stream ford that had become a potential barrier to migrating bull trout and westslope cutthroat. The ford had created a wide shallow area that had the potential to limit suitable flows for fish passage, particularly during low water periods when bull trout tend to migrate. Access roads were obliterated and replanted to protect connectivity in the stream.



New Bridge will Benefit Teepee Creek Cutthroat Trout

During 2009, Idaho Fish and Game, and the U.S. Forest Service removed a culvert and built a bridge over Short Creek. Short Creek is a tributary to Teepee Creek at the upper end of the Coeur d'Alene River drainage. Money for this project came from the Idaho Office of Species Conservation.

So why is Idaho Fish and Game in the business of building bridges? Short Creek is an important spawning stream for westslope cutthroat trout. Fry produced in this stream move downstream into the Coeur d'Alene River as they grow and may benefit the sport fishery throughout the drainage. The culvert that was in place was a partial barrier to the movements of trout. Small trout, particularly during low flow conditions, would have had trouble moving upstream through the culvert. With the bridge in place, the stream has a much more natural channel with rocks to slow the water and provide small pockets for resting fish.

Four rock vanes were also built into the streambed. The vanes are a "V" shaped row of large rocks that span the width of the stream. The rock prevents the stream from down-cutting and causing erosion, and also creates pools for fish habitat. Ultimately, projects such as this will help to improve the fishing in the Coeur d'Alene River system.



Chain Lakes Bass Surveys Reflect Healthy Populations

A popular group of lakes for warmwater anglers in the Panhandle is the “chain lakes”. The series of eight low-lying, shallow lakes (aka “lateral lakes”) are connected to the Coeur d’Alene River and, like Coeur d’Alene Lake itself, are maintained at a greater depth through the summer by Post Falls Dam. These lakes are well known for their largemouth bass, crappie, and northern pike fisheries, which take advantage of the relatively warm water and abundant vegetative cover.



To evaluate the largemouth bass populations in these lateral lakes, and compare fish density and angler exploitation with surveys from past decades, IDFG personnel tagged and released over 600 bass in six of the eight lakes in 2009. Bass were initially collected and marked using an electrofishing boat on Anderson, Blue, Cave, Medicine, Killarney, and Thompson Lakes from May 3rd-5th. To estimate the populations, a second “recapture” effort was conducted approximately 10 days later (May 12th-14th). This allowed the fish to redistribute evenly throughout the lakes. All bass over 12 inches were marked with colored Floy tags inserted below the dorsal fin (see photo). The tags were each labeled with a specific ID number and telephone reporting number. Adjustments were subsequently made to the estimates based on angler reporting rate, tag loss, and fish mortality.

The density of largemouth bass in the lateral lakes has remained relatively unchanged over the past 11 years. An IDFG study in 1998 reported similar exploitation and densities of largemouth bass over 12 inches in Cave, Medicine, and Killarney Lakes (see table). Bass populations can be quickly assessed based on a “stock density index”. “Stock” size for bass is 8 inches, so Proportional Stock Density (PSD) is the proportion of stock-size fish that are over 12 inches in length. Relative Stock Density (RSD-16) is the proportion stock size fish greater than 16 inches. We saw an increase in the proportion of larger fish compared to the 1998 survey. This may be partly related to the timing of the surveys influencing the size of the catch, as many of the larger fish were just beginning to move to warmer water around the edge of the lakes, making them vulnerable to the electrofishing boat. Although temperature could be a factor in comparing 1998 to 2009 samples, the growing number of catch and release anglers may also be a contributing factor to larger fish showing up in Cave, Medicine, and Killarney.

As of December 31, 2009 63 tags have been reported by anglers. Over two-thirds of the bass that were reported were released. This is not surprising, given that many avid bass anglers rarely harvest largemouth bass. Furthermore, many of the chain lakes are not easily accessible, which limits harvest-oriented angling effort. Based on the number of tag returns we estimate an average annual harvest rate of 9%. Not surprisingly, the majority of the fish that were harvested were caught in May and June, when largemouth bass are typically the most aggressive and found in shallow water. The low overall harvest rates, the size structure, and the abundance of “old growth” fish are representative of a healthy and high quality bass fishery.

Quality bass regulations (currently none under 16 inches) were implemented in the 1980s on Blue and Anderson Lakes in order to provide areas where bass can grow to quality sizes and spawn multiple years before being captured. Samples in 2009 show that the proportion of fish over 16 inches (RSD-16) was highest in Anderson Lake, which suggests the quality bass regulation (2 bass limit with 16” minimum size) has been effective.

Size structure indices (PSD and RSD-16), population, density, and exploitation rates of largemouth bass in select lateral lakes compared with those same indices in 1998.

Sample Year	Lake	PSD	RSD-16	Population Estimate	Density fish/ha	Annual Exploitation
2009	Anderson	82.4	50.5	529	2.4	0%
	Blue	56.8	22.2	1180	12.8	4%
	Cave	78.6	23.3	991*	2.5*	12%
	Medicine	91.1	34.5			17%
	Killarney	76.1	33.1	417	2.1	3%
	Thompson	71.0	27.3	363	5.2	21%
1998	Cave	45	4	736	2.6	13%
	Medicine	56	9	490	5.3	7%
	Killarney	89	67	538	2.6	0%

We have a very healthy population of large-mouth bass in the chain lakes, with relatively low harvest rates and an abundance of “old growth” fish

One important observation from the 2009 survey was that the lateral lakes are not “closed” populations, meaning fish can readily move from one lake to the next. Whether it be by redistribution of fish following bass tournaments or by natural movements by the bass themselves, the tag reports demonstrated that movement between lakes was very common. For this reason, quality bass regulations may not be affecting these lakes individually, but rather it may allow a short safe haven from harvest during spawning followed then by emigration to another lateral lake. A closer look at how quality size relates to exploitation will allow us to determine whether regulation changes are appropriate.

* Due to low number of recaptures in Medicine Lake, Cave and Medicine were combined for population

“Snorkeling” Panhandle River Trout Populations

Biologists annually conduct “snorkel surveys” in the St. Joe and N.F. of the Coeur d’Alene rivers to monitor fish populations and evaluate impacts of changing regulations and habitat conditions. Snorkel surveys are simply standardized transects (typically 50 to 100 yards long) that biologists swim through using wetsuits, masks, and snorkels, usually in early August. The crystal clear water of many of our rivers and streams make this an extremely accurate, harmless, and cost-effective method of monitoring fish populations. Because many of the stream transects were established in 1970’s, we have over 35 years of fish density information that allow managers to examine long term trends in fish numbers.

with an average of 0.84 fish/100 m² or about 339 fish/mile. About 42% of the cutthroat trout observed were estimated to be \geq 12 inches in length (compared to 24% in 2008) and their overall density was calculated to be 0.35 fish/100 m².

Little N.F. Clearwater River

The Little North Fork Clearwater River (LNFCW) is one of the most remote rivers in the Panhandle Region. It provides an important fishery for westslope cutthroat trout and valuable habitat for an increasing bull trout population. The LNFCW is special to many people looking for quality trout fishing and solitude. Road access to the LNFCW is limited to the upper portion, with over 15 miles of the river accessible only by trail and another 15 miles of the river without trail access at all. Unlike the St. Joe and Coeur d’Alene rivers, which have been surveyed every year since the 1970’s the LNFCW surveys didn’t begin until 1997. Because of the relatively low angler use and difficulty of access we generally survey the LNFCW every three years.

IDFG personnel snorkeled 48 transects in the LNFCW River in 2009. A total of 513 cutthroat trout, 153 rainbow trout, and 406 mountain whitefish were counted. Fourteen bull trout were also observed. Cutthroat trout were observed in all of the 48 transects. Densities of cutthroat trout (all size classes) ranged from 0.16 to 14.7 fish/100 m² with an overall average of 1.66 fish/100 m². About 24% of the cutthroat trout observed were estimated to be 12 inches in length and their overall density was 0.39 fish/100 m². Cutthroat densities were very similar to 2002 and 2005, but about fourfold higher than 1997.

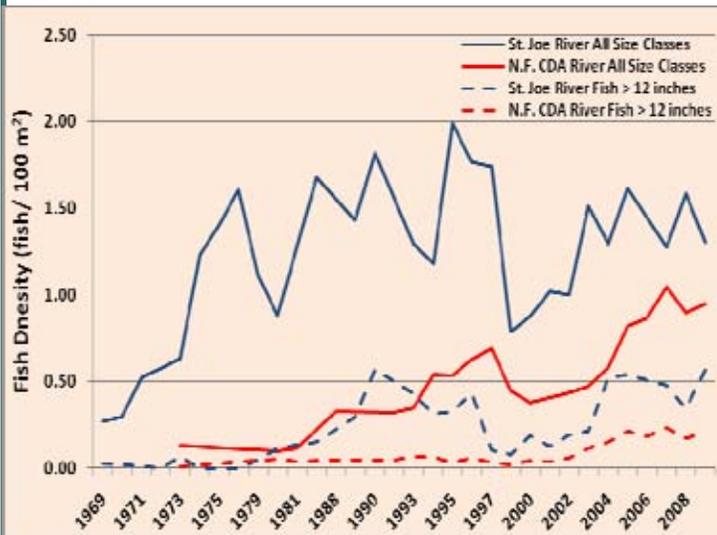
Based on snorkeling, the population did not appear to be overfished, but to gain a better understanding of harvest rates, we marked 119 cutthroat trout with Floy T-bar anchor tags. The tags provide a phone number for anglers to call and report their catch. Preliminary results show exploitation

was less than 5% in 2009, confirming that harvest is not impacting the population. Exploitation estimates in past years based on tagging also indicated levels of harvest less than 15%, which is very compatible with a high quality fishery.

A nice cutthroat trout is tagged on the Little North Fork of the Clearwater to help estimate harvest rates.



The particularly low return in 2009 may be partly related to one of the main accesses being blocked by a temporary road closure for the majority of the summer. Nevertheless, the densities, size structure, and generally low exploitation are reflective of a very healthy stream fishery that should continue to provide a quality fishing experience for those willing to make an extra effort.



Density of all trout and trout over 12 inches in in the St. Joe and Coeur d’Alene rivers based on snorkel counts.

Coeur d’Alene River

Forty-three snorkel transects were surveyed in the North Fork Coeur d’Alene River system. A total of 1,341 cutthroat trout, 60 rainbow trout, 5 brook trout and 4,140 mountain whitefish were counted. Cutthroat trout were observed in 38 of the 43 transects snorkeled. Densities of cutthroat trout (all size classes) in these transects ranged from 0.00 to 8.75 fish/100 m² with an overall average of 0.90 fish/100 m², or about 348 fish/mile. About 23% of the cutthroat trout observed were estimated to be \geq 12 inches in length and their overall density was calculated to be 0.20 fish/100 m². The overall cutthroat densities in the N.F. Coeur d’Alene River system are on the increase. The last three survey years have been the highest densities of cutthroat recorded since the surveys began in 1973 (see figure).

St. Joe River

Thirty-five transects were surveyed in the St. Joe River. A total of 848 cutthroat trout, 9 rainbow trout, and 1,320 mountain whitefish were counted. One bull trout was also observed near the confluence of Gold Creek. Cutthroat trout were observed in 34 of the 35 transects we snorkeled. Densities of cutthroat trout (all size classes) ranged from 0.00 to 5.97 fish/100 m²

Spirit Lake Ice Fishery a Big Hit



During the past year, Spirit Lake proved once again why it is one of the Pacific Northwest's best producers of kokanee. Last winter the ice cover on the lake was great and ice fishermen were taking full advantage of it. Limit catches of 15 kokanee were fairly common, often with only a couple of hours of fishing time. The summer fishery was also good and we had some concern that over-harvest could be a problem.

We monitor this lake fairly closely. Idaho Fish and Game both trawls the lake with nets and conducts hydroacoustic surveys (similar to sonar sampling) to estimate the abundance of kokanee. During the surveys in July of 2008, we estimated

the lake contained a strong year class of almost 200,000 two year old kokanee. That was almost 140 kokanee for every acre of water and well above average. At this time they were about 7 to

8 inches in length. These were the kokanee being harvested as they matured and became 3 years old in 2009.

We repeated these surveys again in July of 2009. The size of the three year old kokanee had increased to 8 ½ to 10 inches, but their abundance had dropped to 60,000 fish (42 fish/acre). Natural mortality and angler harvest had reduced this year class by 70%, but the remaining fish were still plentiful enough to lay an abundance of eggs for the next generation. It appears the limit of 15 kokanee/angler/day was about right in managing the fishery for the correct amount of harvest.

This year we estimated the lake contained 142,000 two year old kokanee (100 kokanee/acre). This is also a fairly abundant year class. Their sizes are slightly larger than last year at 7 ½ to 8 ½ inches. If the ice cover is good and the fish cooperate, 2009-2010 should again be a good year for kokanee fishing on Spirit Lake.

If the ice cover is good and the fish cooperate, 2009-2010 should again be a good year for kokanee fishing on Spirit Lake

Unique Mountain Lake Fisheries Surveyed

The Idaho Panhandle's mountain lakes are managed to provide a variety of fishing opportunities. Of the 51 stocked alpine lakes, access ranges from a bumpy ride in a 4X4 to several miles of arduous cross country hiking. Most of the lakes that are managed for fisheries are planted with cutthroat trout or rainbow fry. However, for diversity, several lakes are stocked with golden trout and arctic grayling. Golden trout are a sub-species of rainbow trout. The golden trout has golden flanks with a red, horizontal band along the lateral line and often has dark oval marks, called "parr marks", on each side. The arctic grayling is an elegantly formed cousin of the trout. With its sail-like dorsal fin dotted with large iridescent red or purple spots, the grayling is one of the most unusual and beautiful fish in the Panhandle. Grayling are generally dark on the back with iridescent gray sides and have a number of black spots scattered along the leading portion of the body.



Arctic Grayling

In 2008 and 2009, IDFG personnel sampled 10 lakes with gill

nets from mid June to late September specifically to get a better Mean (average) and maximum length (inches) of golden trout and grayling captured in 2009 alpine lake surveys.

Lake	Golden Trout		Arctic Grayling	
	Mean	Max.	Mean	Max.
Callahan			10.6	11.3
Crater			8.7	16.1
Dismal			0	0
Forage	12.4	15.2	15	15
Little Ball Creek			0	0
Long Canyon	8.7	9.8		
Long Mountain	4.3	4.3		
Lower Glidden			0	0
Parker	12.3	13.8		
Steamboat			7.4	8.6



Golden Trout

understanding of golden trout and arctic grayling growth, survival, and possible interactions between species. The sampling showed that both species grow and survive in Panhandle lakes; however there is some evidence that suggests that intense predation by other stocked salmonids may suppress or altogether eliminate grayling populations. Grayling were generally not found in lakes that are stocked on a regular basis or have naturally reproducing trout populations, such as Dismal or Lower Glidden lakes. Other lakes had abundant populations of goldens or grayling with both species exceeding 15 inches in some lakes. The results of the survey will help us use our available grayling and golden trout most efficiently and maintain more consistent fisheries.

Upper Priest Lake

Native cutthroat and bull trout (along with kokanee) once provided popular fisheries in Priest and Upper Priest lakes. Overharvest, habitat degradation, and the expansion of the non-native lake trout population caused a collapse of the popular fisheries in the 1980's. Bull trout were closed to harvest in 1984, and cutthroat were closed to harvest in 1988. Despite improved habitat conditions and harvest closures, cutthroat and bull trout never fully recovered. Populations of both species are largely non-existent in the lower lake. The native species are not able to withstand the predation and competition associated with the abundant lake trout population.

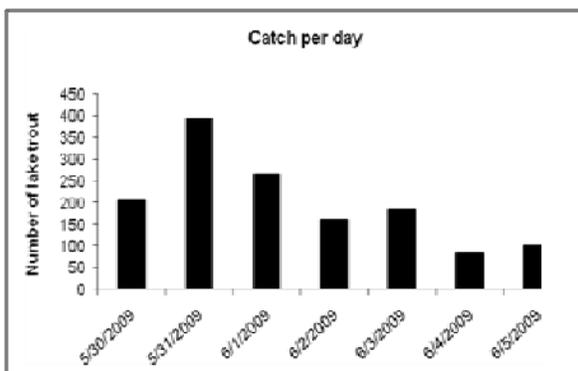
Upper Priest Lake represents the last hope for native cutthroat and bull trout in the Priest Basin. The upper lake and river still harbor viable (though not abundant) populations of both species. While the lake trout population was exploding in the lower lake in the 1980's, they were not common in Upper Priest Lake for another decade. Unfortunately, it was just a matter of time. By the late 1990's lake trout were firmly established in Upper Priest Lake, and bull trout populations were in decline.

Upper Priest Gillnetting

In response to the problem, IDFG (with funding from USFWS) has used gill nets to remove between 150 and 2,100 lake trout each year from Upper Priest Lake since 1998. For the past three years, Harbor Fisheries, Inc. of Baileys Harbor, Wisconsin was contracted to use their 36 foot commercial gill net boat.

In 2009, the netters fished for seven days, setting a total of 25.8 miles of gill net and removing a total of 1,353 lake trout. Catch rates declined throughout the seven day effort, as would be expected if the population is being depleted (see figure). Given the "bathtub" shape and the ability to distribute nets throughout the lake, it's not surprising that the effort could remove a high percentage of its lake trout. In fact, population estimates made with the net catch-rate data indicate over 80% of lake trout have been removed each year. Unfortunately, the high catch rates the following year are a strong indication that Upper Priest Lake is being re-populated annually through immigration from Priest Lake.

Fortunately, bull trout redd count data from Upper Priest River and tributaries suggests the annual lake trout suppression effort is having a positive impact. Observers in 2009 counted 34 bull trout redds in the drainage. Although this is far below the levels from the 1980's, it was nearly five times the number observed two years ago, and is the most observed since 2003. Equally encouraging is the number of juvenile bull trout that have been observed in the lake itself, demonstrating successful reproduction and recruitment to the population.



Daily catch of lake trout using gill nets in Upper Priest Lake during the June, 2009 suppression effort.

Thorofare Immigration Evaluation

While the benefits of the netting effort are encouraging, it has become increasingly clear that Upper Priest Lake cannot be treated as a "closed system". The annual replenishment of the lake trout population, as well as tagging studies in the 1990's demonstrate that a large number of fish move between Priest and Upper Priest lakes through the Thorofare, the 2-mile channel connecting the two lakes. In the long-term, effective suppression of lake trout in the upper lake will be contingent on curbing movement through the Thorofare.

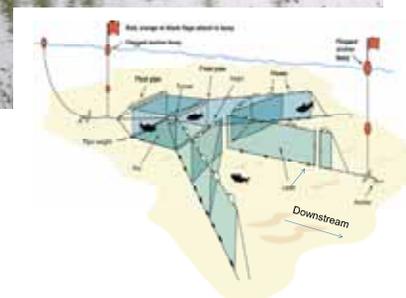
Options for eliminating or minimizing lake trout immigration from Priest Lake are limited, complex, and expensive. Though strobe lights, electrical weirs or mechanical weirs have all been effectively utilized in other systems, none of those alternatives is certain to be effective in the Thorofare. The remote location, classification as a wild-and-scenic river, and the volume of boat traffic further limit alternatives.

Given the limited options, we felt the most effective short-term solution would be the use of conventional nets and traps set in the Thorofare during fall, when the majority of lake trout movement is thought to occur. In October 2009, we deployed a commercial trapnet similar to the trapnets used on Lake Pend Oreille but on a smaller scale (see photo). We also used gillnets above and below the trap net to gage the effectiveness. The majority of lake trout were captured in gillnets, demonstrating a clear avoidance of the trap net, despite leads that extended from bank to bank. Lake trout entered the gillnets from both directions, indicating both upstream and downstream movement.

In addition to documenting adult lake trout movement between the lakes, we collected cutthroat, bull trout, mountain whitefish, and other species, indicating the Thorofare is an important migratory corridor for native fish. Any migration barrier will have to be evaluated relative to negative impacts to these fishes as well.



Trap net being deployed in the Thorofare and diagram of a typical trap net.



A passive barrier, such as large trap nets, may prove to be the only biologically and socially acceptable (and feasible) means to regulate fish passage in the Thorofare. In 2010 we will continue to remove lake trout from Upper Priest Lake. At the same time, we will seek funding to further develop various nets to minimize lake trout immigration from the lower lake.

Kootenai River Fisheries Restoration

Biologists use Multiple Techniques to Monitor Sturgeon Population and Behavior

The U.S. Army Corps of Engineers has provided mitigative discharges from Libby dam in an attempt to stimulate white sturgeon spawning and recruitment since 1991. One of IDFG's main tasks each year is to evaluate the effects of the 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 2009, 17 tagged sturgeon (6 females) were in spawning condition and all migrated as far as lower Shorty's Island. Only four migrated further upstream to Bonners Ferry, and none were recorded in the braided reach. Substrate conditions in the braided reach at present appear to be more favorable for successful re-



Larval sturgeon sampling below free embryo release sites on the Kootenai River.

production and early life stage rearing and determining the discharge and temperature conditions under which we can maximize movements into this reach is currently a high priority. In 2008, 26 tagged adult white sturgeon (13 females) were in spawning condition and all migrated as far as rkm 235.2. Twenty-three (13 females) of the migrating adults were recorded just below Deep Creek, and 18 (nine females) of the migrating adults went upstream as far as Ambush Rock. Additionally, 13 (six females) of the tagged migrating adults went above the Hwy. 95 Bridge in Bonners Ferry into the braided reach. One female white sturgeon went upstream to rkm 268.5, the furthest upstream migration any tagged white sturgeon has been recorded since IDFG began telemetry studies in 1991.

While spawning downstream of Bonners Ferry has been documented each year since this investigation began, successful reproduction has not occurred since at least the early 1970's. To better understand how substrate and flow affect post-hatch survival, we initiated a release of one to four day old free embryos. In 2008, over 740,000 free embryos were released at five sites above Bonners Ferry in Idaho and Montana. We sampled below the release sites with plankton nets (see photo above) to document drift and any subsequent survival of embryos and larvae. One larval sturgeon was collected on July 14 at the Caboose Creek side channel site 13 days after free embryos were released near this site. Total length was about a half an inch and the barbels were clearly visible. In 2009, over 760,000 free embryos were released at seven similar sites. No larval sturgeon were collected. Recruitment to gill nets several years post release may be the best way to determine the effectiveness of this experiment.

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 Kootenai Tribe of Idaho (KTOI) hatchery has released over 150,000 juvenile white sturgeon in the Kootenai River. In 2009, we sampled 11 standardized sites in Idaho and collected 575 hatchery reared and 5 wild juvenile sturgeon (five additional wild juveniles were captured in Canada). These ten wild juveniles ranged from 14 to 48 inches. Eight different year classes were represented from 1991 to 2006. Adult Kootenai River white sturgeon are not ready to spawn until at least 30 years of age. Although there is some wild recruitment most years, even with low mortality after age two the number of wild recruits is currently inadequate for a viable wild spawning population.

Experimental Supplementation may help Burbot Population

The Kootenai River burbot population is also in serious decline because of habitat alterations due to operations of Libby Dam. The primary reasons appear to be temperature and discharge changes to the river, with warmer water and higher discharges during the burbot spawning season. Popular burbot fisheries in Kootenay Lake, British Columbia, and the Kootenai River, Idaho, had collapsed by the late 1970s. Neither population has recovered despite closure of the fisheries. Burbot represent a significant historical and cultural resource to the local region and are the subject of a regional Burbot Conservation Strategy developed by local stakeholders.

One of the measures includes the culture of burbot in a hatchery environment to produce young for stocking in the river. Extensively rearing burbot, outside of a hatchery environment in ponds, may be an important short term measure to population rehabilitation in the Kootenai River. This technique is used very successfully in the Midwest for wall-eye and channel catfish. The objective in 2008 and 2009 was to determine if extensively reared burbot larvae in a pond and net pens could achieve a 10% survival rate and grow to a range of 70 to 98

Larval burbot are held in enclosed pens and in small ponds as part of an effort to develop aquaculture methods to help maintain the population.



mm total length within six months of stocking. On May 18, 2009 IDFG in cooperation with the University of Idaho Aquaculture Research Institute, KTOI and BC Ministry of Environment, released 15,000 burbot larvae into a private (0.15 ha) pond and five net pens placed in the pond. Of the total, 467 were placed into

(Continued on page 11)

Kootenai River Fisheries Restoration

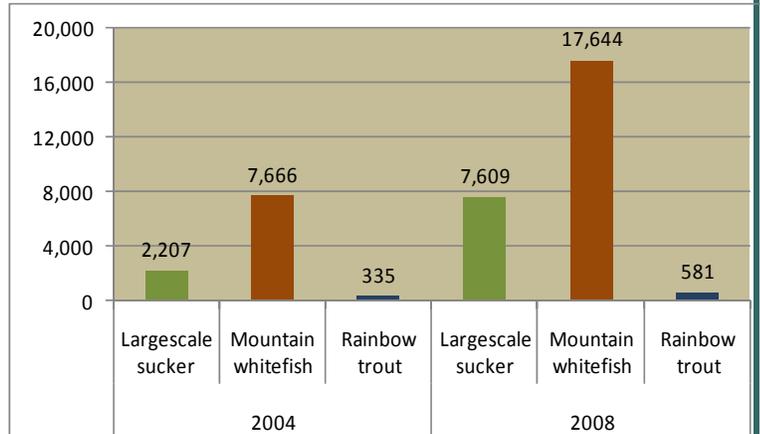
five pens at high and low stocking densities. Light traps were used in the net pens to capture young burbot to determine general abundance and growth. A total of 222 burbot were captured in the net pens during the sampling period. On September 2, 2009 all burbot in net pens were measured and transported to the KTOI Hatchery. A total of 96 burbot were recovered from the net pens with an average total length of 49 mm. Survival ranged from 6% to 60% with an average of 36%. No Burbot were recovered from the pond outside, whereas in 2008 survival in the pond was less than 1%.

This extensive rearing study will likely be carried out one more year. Mortality in the net pens was likely due to cannibalism because of a shortage of food. Rearing of low numbers of burbot in net pens can reduce early mortality but unless plankton (food) densities are maintained at adequate levels, mortality due to cannibalism can be significant.

Nutrient Restoration Program benefitting Fish Populations

Since Libby Dam went into operation on the Kootenai River in the early 1970's, primary productivity in the Idaho portion of the river has been severely impacted. Water quality experts estimate that approximately 63% of nitrates and 25% of phosphorous are lost through binding to sediments in Kococanusa Reservoir. This loss of nutrients impacts algal growth and in turn, organisms higher on the food chain including insect and fish communities. To help make up for this loss of productivity and restore fisheries, a large-scale nutrient addition program was initiated on the Kootenai River in 2005. Phosphorous (as ammonium polyphosphate 10-34-0) has been added to the river for 5 years from approximately June-September, which is the main growing season. The program is a partnership between Idaho Fish and Game and the Kootenai Tribe of Idaho, funded by the Bonneville Power Administration (BPA). Part of this project is to monitor the effectiveness of the nutrient restoration.

Since we began adding nutrients to the river algae growth and insect densities have increased substantially. Algae and, in turn, insects are the first organisms to use the nutrients, so the response at those lower trophic levels was very quick. The question is whether the nutrients are working up through the food chain to benefit the fish populations. The results are encouraging. We have seen increases in populations of mountain whitefish and largescale suckers, the two most abundant species in the treatment reach, as well as rainbow trout. An estimate conducted in 2008 found that numbers of mountain whitefish had more than doubled since 2004 (see figure). This estimate is similar to an estimate from 1980-81, which is believed to be similar to pre-dam numbers. The largescale sucker population also tripled during the same



Populations of three species of fish, representing different levels of the food chain, in response to nutrient enhancement on the Kootenai River.

time period and the number of rainbow trout increased by 1½ times. We have also reported increases in relative weight (Wr) and condition factor (K). These two "plumpness" indices provide a means of comparing the condition of Kootenai River fish to other populations. Mountain whitefish, largescale sucker, and rainbow trout showed increased Wr and K in the treatment reach after nutrient addition. Growth rates have also improved, with mountain whitefish being slightly longer at a given age in the treatment reach than the untreated reaches.

Although we have seen increases in the population of rainbow trout and some indication that condition has improved, density and growth of fish in the Idaho portion of the Kootenai River remains below the Montana portion of the river as well as other rivers in the state. The population is comprised largely of fish less than 16" in length. As the effects of increased nutrients make their way up the food web, we predict that growth and survival of rainbow trout will increase. However, spawning habitat is limited in the Idaho portion of the river so juvenile recruitment is low.

Harvest may also be playing a role in limiting the population. A creel survey in 2000 found that harvest was 58%. As a result, a quality trout regulation of a 2-fish limit with none under 16" was implemented in 2002. Numbers of fish in the 12"-14" range have increased but numbers of larger (>16") fish remained steady until 2008, comprising around 1% of the total rainbow trout catch. In 2009 numbers of larger fish increased to 5% of the catch, and we anticipate that this trend will continue. We will begin another creel survey in spring 2010 to re-evaluate harvest. We are confident that the nutrient restoration program combined with quality trout management will continue to improve this fishery.

The rainbow trout population has increased 50% since nutrient restoration began in 2005, and the mountain whitefish population has more than doubled



Acknowledgements:

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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

Students get Firsthand Look at Pend Oreille Recovery Effort

Each year IDFG provides opportunities for anglers and other interested citizens to get a first hand look at the lake trout netting program. This not only makes for an interesting experience for folks, but it goes a long way to clearing up misconceptions, misinformation, and exaggerations associated with the program.

In September 2009 we went a step further and took 50 Sandpoint area high school students out on the lake. The students and their teachers first listened to an on-shore "lesson" where they learned about the objectives of the program. They were then taken out on boats where they watched the crew lift gill nets and trap nets, and process the fish.

The field trip was a success for all involved. The students got an up-close look at a commercial netting boat in action and a lesson in fisheries management. It was also an opportunity for them to get an in-depth look at an important public resource management issue. In return, IDFG got 50 young people who now have a greater appreciation for the Lake Pend Oreille ecosystem and the efforts underway to maintain the world-famous fishery.



Tagged Fish Help IDFG Make Good use of Hatchery Fish

IDFG state fish hatcheries play a major role in providing trout angling opportunity. Each year, hatcheries stock over 160,000 catchable-size rainbow trout in Panhandle lakes, making hatchery fish an important part of the angling experience for many people. In an effort to make the best use of trout hatchery products we've initiated an ongoing program to monitor return-to-creel or exploitation in regional lakes stocked with hatchery rainbow trout.

In 2009 we compared return-to-creel rates and time from release to harvest for catchable rainbow trout in two Panhandle Region lakes. We used the newly created IDFG state-wide tagging hotline to help with the study (see poster). Hatchery trout were tagged with orange T-bar anchor tags by inserting the tag just below the dorsal fin. The tags were labeled with a toll-free telephone number and an individual tag number. We then released 200 catchable-size fish into both Kelso and Round Lakes during April and June 2009. All fish used in this study were raised at the IDFG Nampa Hatchery, then transferred to and distributed by the Clark Fork Hatchery.

Once the fish are re-

leased, it's up to the anglers to provide the data. IDFG has posted signs around the state at access sites, license vendors, regional offices and sporting goods outlets explaining the tag reporting system and what the information is used for. Anglers are asked to report tagged fish, either through the toll free automated hotline or through the IDFG website.

At the end of the year, the number, date, and capture location of tagged fish is summarized. Adjustments are made to the return rate based on angler reporting rates (which is dependent on the \$\$ amount of the reward), tag loss, and mortality due to tagging. As of Dec 31, 2009, angler harvest rates for the stocked trout was estimated to be 24% and 61% for Round and Kelso Lakes respectively.

We like to see at least a third of the catchable-size fish that are planted return to the creel in the first year. Considering that it costs over a dollar on average to raise and plant a rainbow trout, anything less than that becomes an inefficient use of an expensive resource. The Kelso return rates were amongst the highest we see anywhere, and although the Round Lake return rates were lower than desired, additional returns may come this winter and spring, bumping the *annual* return rate higher.

In the coming years we will continue with a systematic assessment of catchable trout return-rates around the region in order to make the best use of our hatchery fish. More efficient use of the hatchery fish could involve stocking fewer or no fish in waters with poor returns, increasing the number stocked in heavily fished lakes, and/or adjusting the stocking schedule.

So if you or your fishing partner lands a fish with a tag, we need your help! Reporting the fish is quick and easy, and it's one way you can help us make fishing better around the region—and you might even get a reward!

Idaho Department of Fish and Game
TAG! YOU'RE IT!
Fish Tag Hotline (toll free) 1-866-258-0338
Website: fishandgame.idaho.gov

Anglers may keep or release the fish.
If you release the fish, please wear down the tag number and release the fish with the tag intact. The tag may include a reward amount; the tag must be clipped from the fish and returned to IDFG for the reward to be paid. If two tags are with the fish, both numbers are needed.

Why do we need this information?
IDFG uses tag information to manage the fishery by estimating the harvest, survival, growth, and migration of various fish species.
Aside from taking an active role in managing the resource, anglers will receive a history of the fish, see how long it lives and when it was tagged, how long it was when it was tagged, and information on whether it had previously been caught and released.

What to do when you catch a tagged fish:
Contact IDFG with this information:
• Tag number(s)
• Where the fish was caught
• Date caught
• Species
• Length of fish
• Did you keep or release the fish?
• Did the fish have two tags?
• Would you have kept the fish if it were not tagged?
• If released, was the tag removed?
• Your name, address, and phone number
• Do you want the tag returned to you?

Fish Tag Hotline (toll free): 1-866-258-0338
Website: fishandgame.idaho.gov
Go to the Fishing Page

Mail reward tags to:
Fish Tag Returns
1414 E. Locust Lane
Nampa, ID 83686