Wyoming Game & Fish Department
Conserving Wildlife—Serving People

2010 Edition

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Tracking Trout Movements and Teaching Youth Continues in Dubois

Since October of 2008, WGFD, Trout Unlimited (TU), and Gregory Aquatics have been tracking fish in the Wind River drainage to collect valuable information about trout movements and habitat, and to teach Dubois youth about aquatic resources. First, a yearlong study of Yellowstone cutthroat trout (YSC) movements in the East Fork drainage was completed last fall to help us better manage this sensitive species that occupy one of the most intact stream systems for YSC in the state. Second, we tagged some rainbow trout and brown trout at Dubois City Park in October 2009 to gain some insight to their movements, possible entrainment issues, and provide another year of opportunities for kids to learn about fish and their habitat through TU's "adopt-a-trout" program.

View from airplane window during a flight to locate tagged Yellowstone cutthroat trout in the East Fork Wind River drainage.

Movements of YSC in the East Fork drainage were evaluated by implanting radio transmitters in 41 fish during the fall of 2008 and in 16 during the spring 2009. Fish were released near their capture site and located monthly until the batteries in the radio transmitters quit (6 months). Some of the goals of this research were to identify spawning and winter habitat, and determine when fish begin spawning migrations. Additional information on fish entrainment associated with irrigation systems was also

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collected. This information will allow us to protect and better manage YSC and improve their habitat in the East Fork. Here are some of the results we found in our YSC research:

- YSC make extensive migrations during the spawning season (May-July); one fish moved over 25 miles while the average movement was 14 miles
- Almost all fish captured in the East Fork were associated with complex woody debris jams, which were scarce
- YSC were often located near woody debris, large boulders, or bedrock outcrops during the winter
- One fish became entrained in an irrigation ditch and was found dead in an irrigation pipe.

These results emphasize several things: structure is important for winter habitat and possibly trout production; diversions should be evaluated to ensure fish are able to exit when entrainment occurs; it is important to ensure potential migration blockages such as road crossings are constructed to facilitate fish movement. A couple projects are being developed to address some of these issues over the next couple years and improve habitat for YSC in the East Fork drainage.

Dubois elementary students have thoroughly enjoyed this project. They have been able to participate on the field days and learn about electroshocking, fish identification, radio telemetry, stream habitat, and fly-casting. TU and WGFD have also spent days in the classroom teaching them about aquatic insects, aging fish, and the obstacles a trout must avoid to live each day.

Currently, we are tracking 8 brown trout and 4 rainbow trout each month through October 2010 that we radio-tagged in City Park in 2009. Some anglers may catch a radio-tagged fish this summer, but the WGFD and TU ask that tagged fish be immediately released at the location they were caught. In the case that an tagged fish is kept or the fish dies, contact WGFD or TU for instructions on returning the radio transmitter. Most radio-tagged fish were 15"-21" in length. An tagged fish can be identified by a 3-4 inch silver wire protruding from the bottom left side of the fish, and may have 3-4 staples on their underside.

Dubois school children receiving a hands-on lesson in using radio tracking equipment from Cory Toye of Trout Unlimited.

A & M Reservoir

This reservoir is located south of Green Mountain and about 7 miles due west of Bairoil. The water supply was reestablished in 2004 after being completely dry for six years. Merit Energy Company supplies pumped well-water to keep the reservoir near full and the Bureau of Land Management has a smaller water well that adds supplemental water. Beginning in 2005, stocking has consisted of approximately 1,000 rainbow trout and 500 brook trout each spring. The reservoir was sampled with gill nets in June to determine the survival and growth of stocked fish. Good numbers of both brook and rainbow trout were captured. The brook trout ranged up to 12.4 inches in length and the rainbow trout up to nearly 17 inches. The fish were in excellent condition, some exceeding 2 pounds. The average size of the fish should continue to increase as their time in the reservoir increases. Internal combustion motors are prohibited at A & M Reservoir, making it an excellent location for float tube anglers.

Helicopter Fish Stocking in Remote Locations

Every year, thousands of people take to the backcountry of Wyoming in search of adventure. For most, the opportunity to wet a line on one of the thousands of backcountry lakes tops the list of priorities. It is not uncommon for backcountry travelers to encounter a diverse assemblage of native and non-native trout while venturing from one lake to another, causing many to wonder "how did these fish get here?" For more than a few it is likely they arrived via helicopter. The Wyoming Game and Fish Department has been stocking alpine and remote lakes with a helicopter for almost 40 years. Every August the Department stocks 50 to 70 lakes throughout the state using a chartered helicopter and a tank suspended below the chopper. The tank system consists of eight separate compartments capable of holding ten pounds of fish per compartment. Each compartment has its own oxygen line and can be deployed individually, allowing us to stock several lakes with each flight.

Helicopter stocking has proven to be the most efficient method of stocking remote areas. Fish are transported to a staging area by truck, loaded into the tanks, and released into their new home in 30 minutes or less, with little to no mortality. Traditional methods, such as horseback and backpack stocking are limited by distance from the trail head to the destination, and require much more man power and time.

Wyoming has approximately 1200 high elevation wilderness lakes that are capable of supporting fish. Of those, more than 740 contain trout. About 620 of these lakes contain self sustaining trout populations and do not require additional stocking by the Department, whereas, nearly 120 lakes are stocked on a two to four year rotation depending on fishing pressure and recommendations of the management crews based on population indices. A variety of species are stocked into our alpine lakes, including native cutthroat trout and a variety of non-native species such as golden, rainbow, brook and lake trout. Non-native species are stocked into areas where they will not compete with native fishes.

Armed with aerial photos and GPS coordinates for each stocking site, the helicopter will rendezvous at the staging area with the ground crew at dawn. After a quick safety briefing the ground crew begins loading fish for the first flight of the day. A typical day consists of four to eight flights, stocking up to 30 lakes with flight times ranging from 15 minutes to one hour round-trip. Stocking is done in the mornings while it is still cool and calm, making for safer flights and better conditions for fish. After the final load of the day is sent off, the ground crew heads to the next staging area to start the process again early the following morning.

In the Lander Region there are approximately 497 wilderness lakes, of which 190 support fish populations. Of the 190 lakes that contain fisheries, only about 30 are stocked on a regular basis (every 2-4 years). These lakes must be stocked to maintain a fishery because of a lack of available spawning habitat. Stocked species include golden trout, Yellowstone cutthroat trout, Snake River cutthroat trout, grayling, and brook trout.

Sauger Declines are Cause for Concern

Saugers were once the most widely distributed perch species in North America, but populations have been reduced due to the damming of rivers and blockage of migration routes, loss of river habitat, excessive harvest by anglers, competition with introduced species, and hybridization with the walleye, a closely related species. Saugers are native to the North Platte, Bighorn-Wind, Tongue, and Powder river drainages in Wyoming. They no longer occur in the North Platte River drainage and are rare in the Tongue and Powder river drainage. However, genetically pure populations still occur in the Bighorn-Wind river drainage. In light of sauger population declines in other locations, the populations in the Bighorn-Wind river drainage are valuable fisheries in Wyoming and the region.

Since 2002, three research projects conducted by University of Wyoming graduate students have been conducted. The titles of the research projects were: 1) Factors affecting the distribution and life history of sauger in the Wind River watershed upstream from Boysen Reservoir, Wyoming (Craig Amadio 2003); 2) Seasonal movements and habitat use of adult saugers in the Little Wind River drainage, Wyoming (Kris Kuhn 2005); and 3) Juvenile sauger nurseries and fish assemblages in the Wind River watershed and Boysen Reservoir, Wyoming (Patrick Lionberger 2006). These studies answered a lot of questions and provided much valuable information. Still, there remains a great deal of unanswered questions.

The highest densities of sauger within the Wind River drainage above Boysen Reservoir are found in the lower Popo Agie and Little Wind rivers, within the Wind River Reservation. The Game and Fish works cooperatively with the U.S. Fish and Wildlife Service and the Shoshone and Arapaho Tribes to study and manage sauger populations in the area. A monitoring program was developed and initiated in 2006 to follow trends in population numbers, size structure, and recruitment within the core area of sauger distribution. Since that time we have been observing steady declines in the estimated number of sauger at our monitoring sites. Sauger numbers have also declined drastically since 2000 in Boysen Reservoir. Causes for sauger declines in the upper Wind River system are unknown at this time.

During the coming years, emphasis will be placed on maintaining and restoring our native sauger population. Two research projects are currently underway to obtain more information on sauger in the upper Wind River watershed. The first is a study being conducted by a University of Montana graduate student on the genetic makeup of saugers in the upper Missouri River system and will answer the following questions: 1) Are there genetically distinct sauger populations in the upper Missouri River watershed, including populations from the Wind River drainage upstream from Boysen Reservoir, Boysen Reservoir, and the Bighorn River between Boysen Reservoir and Bighorn Lake; 2) Is hybridization occurring between sauger and walleye populations; 3) Is genetic bottlenecking occurring in sauger populations with low numbers of fish, particularly the Wind River drainage upstream from Boysen Reservoir and Boysen Reservoir. Genetic bottlenecking is caused by small population size that results in excessive inbreeding and loss of genetic variation. This can leave the population less able to cope with changing environmental or habitat conditions. The second research project is being conducted by Game and Fish personnel and will study age, growth, mortality, and effects of environmental variables on recruitment for sauger populations in the Wind River drainage upstream from Boysen Reservoir, Boysen Reservoir, and the Bighorn River between Boysen Reservoir and Bighorn Lake.

Electrofishing for sauger near the confluence of the Popo Agie and Little Wind rivers in 2009.

Russian Olive – Remove it or Keep it?

Russian olive (*Elaeagnus angustifolia*) is a native plant from Eurasia that was introduced to many Great Plains and southwestern states in the early 1900s. They were extensively planted to provide windbreaks at first, and then federal conservation programs promoted their use for wildlife habitat among other things. The Natural Resources Conservation Service (NRCS) continued to subsidize Russian olive seedlings for conservation plantings until the 1990s. However, the NRCS no longer provides seedlings in Wyoming and most of the west because of the impacts they can have on native vegetation. As a result, in 2007 Wyoming joined other states (CO, CT, NM, UT) with its listing of Russian olive as a noxious weed by the Wyoming Department of Agriculture.

Like many exotic plant introductions to North America, the future consequences of establishing Russian olive were unknown in the early 1900s, but are apparent in many of our watersheds across Wyoming today. Russian olive can take over and dominate native vegetation similar to other weeds such as cheatgrass and knapweed, though it usually takes more time. The climate and soils of Wyoming provide good conditions for Russian olive to establish since they are drought tolerant and can handle the high salinity of our soils. They tend to flourish on moist sites near streams, irrigation ditches, and low lying areas and outcompete our native cottonwoods, willows, and other shrubs. Of course, factors such as flood control and grazing pressure have also promoted Russian olive since many of our native plants depend on periodic flooding to establish and are preferred food over Russian olive.

Fortunately, Russian olive in the Lander region has not taken over streams and riparian habitat quite like it has in the Bighorn basin, but give it time and it will happen. Twenty-five years ago WGFD was wondering how to address all the Russian olive seedlings sprouting up on Yellowtail WHMA near Lovell. Nothing was done at that time because of other priorities, but now a lot of money is being spent to give our cottonwood galleries and native shrubs a chance to survive because Russian olives have become so thick little else can grow in the understory. Similarly, some public fishing areas around the state have become virtually unusable because you can't get to the river through the thicket of Russian olive, at least not without ripping your waders to shreds. Clearly, some of our streams have been negatively affected by Russian olive.

People may argue that Russian olives provide good wildlife habitat used by birds, deer, and other species, especially during the winter months. While this is true in certain locations, should we be letting them dominate wherever they become established? No, numerous research articles document the importance of native plants such as cottonwood and willow to much of Wyoming's wildlife. Thus, a more pragmatic approach is needed since there is not enough time or money to eradicate Russian olive in Wyoming, and they may not be a problem in some locations. So, over the past year WGFD developed some guidelines to prioritize Russian olive projects based on several environmental factors and management issues. Based on these guidelines, several drainages in the Lander region are a high priority for removing Russian olive, particularly the Popo Agie and Wind River drainages. So, if you're interested in removing Russian olive and restoring native vegetation along your stream, please give our aquatic habitat biologist a call to assist. (307-332-2688)

Burbot in the Wind River Drainage

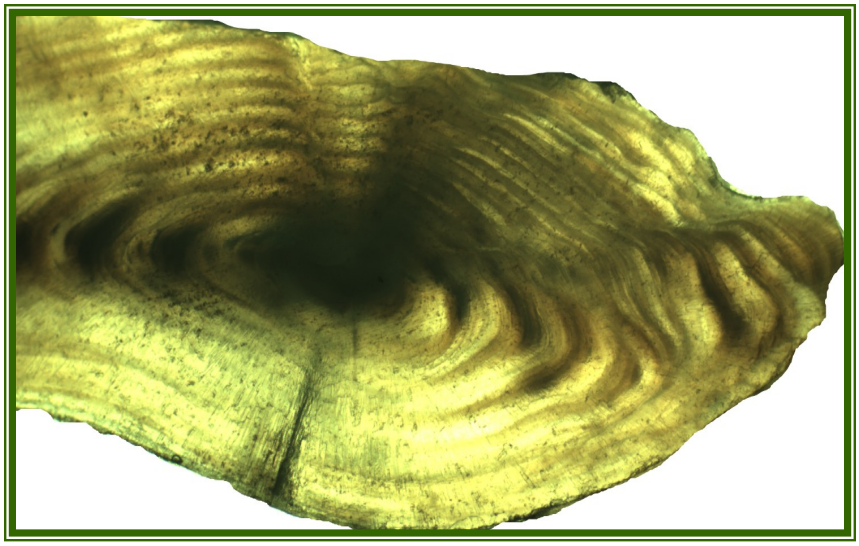
Article by Scott Carleton, University of Wyoming

If you have ever spent much time fishing on the Wind River or any of the lakes that run into it, chances are you have caught a burbot, also known as ling. Interestingly, burbot are one of the few fish species that are circumpolar. That is, they are found on every continent that borders the arctic and have the proud distinction of being the most widely distributed freshwater fish species in the world. The Wind River, here in central Wyoming, is also the southern most extent of their distribution in North America. Imagine, someone over in northern Europe or Asia might be ice fishing for and catching the same species of fish you caught at Bull Lake or Boysen Reservoir. That is a real international connection.

What makes burbot even more interesting is their biology. When describing burbot, physiologists use the term "cold stenothermal", which means they are adapted to live in very cold conditions and do not tolerate warm water temperatures very well. This "scientific" term actually reveals a lot about the unique biology of this very interesting fish. Because burbot are adapted to live in cold conditions, the winter is when they are most active. For those of us that spend the winter months ice fishing, we already know that is when you catch burbot. This is also the time of year when burbot spawn; almost always under the ice.

During a time of the year when most other fish are inactive, how is it that burbot are most active? The secret is in their over-sized heart and liver. A burbot's heart is larger than most other fish and is built to efficiently deliver a lot of blood to their body under extreme cold conditions. They also have an extremely large liver that is 1/3 of their body weight and in the fish world that is huge. This large liver stores all of the nutrients that burbot need to fuel their high energy demands and be active during the coldest time of the year.

Despite all that we know about burbot biology and how they can be so active during the coldest time of the year, there are still important aspects of their life history that we don't quite understand, yet. One aspect of their life history we would like to know more about is when and from where they move within the Wind River watershed. For animals that live on land, it is often more obvious when and where they move during different seasons. For animals that live under water, understanding seasonal movement patterns of both adult and juveniles can be much more difficult. Most fish, including Burbot, provide a way to answer this question using an ear bone called an otolith.



Cross section of a burbot otilith., showing annual growth rings.

Otoliths function much like our inner ear and help fish balance in the water. Otoliths also increase in size as the fish grows and it is this characteristic that makes this bone so useful to fish biologists. The otolith grows rapidly when the fish grows rapidly and slowly, or not at all, when a fish's growth slows down. This type of growth is seen in fish between summer when they are growing and winter when they are not

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growing. This pattern of growth is reflected in the otolith with wide bands during the summer and very thin bands in the winter; very much like the rings of a tree. Fish biologists can use this growth pattern to age fish and analyze growth rates. We can use this same pattern, but in reverse since they grow most in the winter, for burbot here in the Wind River watershed. By taking a cross section of the otolith we can age the burbot and look at their growth rates.

Otoliths also record the characteristics of the environment fish live or have lived in. Every body of water whether it is a creek, river, or lake has a unique signature that is derived from the rocks it flows over. As the rock slowly erodes it releases trace elements into the water that are then incorporated into the tissues of the fish. Specifically, these trace elements are incorporated in small amounts into a fish's otolith. Once it has been grown, the material in the otolith is a permanent record of where a fish was born and where it has moved, or not moved, during its life. Using a recently developed laser technique, we can systematically remove material from each band of the otolith for analysis of these trace elements. This new tool allows us to look at where burbot in the Wind River watershed are coming from and at what age they are moving.

We are currently involved in a project between the Wyoming Game & Fish Department and the Wyoming Cooperative Fish and Wildlife Research Unit at the University of Wyoming in cooperation with the United States Fish & Wildlife Service and the Shoshone and Arapahoe Tribes to identify important spawning and rearing areas for juvenile burbot in the Wind River and it's tributaries. The main purpose of this study is to identify where burbot within the waters of the Wind River watershed are dispersing from and going. For fisherman, this is important life history information that we need to understand. Across their circumpolar range, burbot populations have continually declined and in some areas, even in the United States, burbot no longer inhabit lakes and rivers where they once thrived and provided angling opportunities. The Wind River, however, has a strong burbot population and is a place where incredible angling opportunities still remain. Identifying important spawning and rearing areas, provides key information that fisheries biologists can use to protect and maintain burbot in the Wind River watershed so that fisherman like you and me can continue to have incredible fishing opportunities for burbot in the Lander Region.

Don't Move a Mussel: Preventing Aquatic Invasive Species in Wyoming

Aquatic invasive species are organisms that are introduced into new ecosystems where they cause harm and threaten human uses of water resources. Often called "nuisance" species, they can attach to equipment, boats, and clothing used in the water and can then be transferred from one body of water to another. Once established, these species cause significant problems for aquatic ecosystems and the people who use them. Of particular concern are two species posing a significant and immediate threat to Wyoming –zebra and quagga mussels.

What are they?

Zebra and quagga mussels are freshwater, bivalve mollusks, typically with a dark and white pattern on their shells. They are native to Eurasia and were first discovered in the Great Lakes in 1988, most likely transported in the ballast water of ocean-going ships. They are up to an inch long and are often found in clusters attached to hard surfaces such as boats, piers, pipes, and other equipment. Invasive mussels reproduce rapidly. There are no known populations of these mussels in Wyoming to date, but they have rapidly invaded waters across the country and are now present in Colorado, Nebraska and Utah.

Impacts to You

The negative impacts of invasive zebra and quagga mussels cannot be overstated. They impede water delivery and increase maintenance costs by clogging pipes, pumps, turbines and filtration systems. Invasive mussels can clog water intakes on motors, overheating and ruining boat engines. Invasive mussels remove plankton from the water. Plankton is the primary food source for forage fish - which in turn are the food of sport fish. The result is often a catastrophic decline in sport fisheries.

Zebra and quagga mussels can attach to and ruin boat propellers.

How You Can Help

Overland transport on trailered watercraft poses the greatest risk for spreading aquatic invasive species. To prevent the spread of these mussels to Wyoming and protect our resources, we're asking all boaters and anglers to **Drain**, **Clean**, and **Dry**. Drain all water from your equipment and boat, including the livewell, bilge, and ballast. Clean all mud, plants, and debris from your equipment and boat. Dry your equipment and boat thoroughly before launching in another body of water for at least 5 days in summer, 18 days in spring and fall, and 3 days in winter.

The 2010 Legislature passed a new aquatic invasive species bill that allows the establishment of check stations to inspect watercraft for aquatic invasive species and if necessary decontaminate the watercraft. In addition to encountering check stations at boat ramps throughout Wyoming, boaters will need to purchase a Wyoming Aquatic Invasive Species Decal before launching in any waters in Wyoming in 2010. For more information, call 307-777-4600 or visit http://gf.state.wy.us/fish/AIS/index.asp.

To report an aquatic invasive species sighting, or to request assistance with watercraft decontamination call 1-877-WGFD-AIS.

Don't Move a Mussel

BEFORE YOU LAUNCH IN ANY WATER,

protect your water resource and boat motor from invasive zebra and quagga mussels by doing a

SELF-CHECK

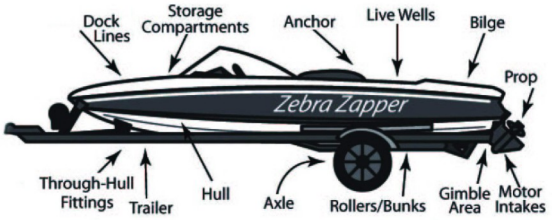
Follow these simple steps to protect your waters:

✓**DRAIN** *All water must be drained from your boat. This includes the ballast, bilge, livewell and motor. Leave wet compartments open.*

✓**CLEAN** *Remove all plants, mud and debris from equipment and boat.*

✓**DRY** *Dry your boat or equipment 5 days in the summer, 18 days spring/fall or 3 days of freezing.*

Help protect Wyoming's waters by making sure you Don't Move a Mussel!



Please contact the Wyoming Game and Fish Department if you see attached mussels on your equipment or in Wyoming waters. We can provide more information and assistance in removal. Call 1-877-WGFD-AIS - (877-943-3247)

WYOMING GAME & FISH DEPARTMENT
"Conserving Wildlife -Serving People"

STOP AQUATIC HITCHHIKERS!
www.ProtectYourWaters.net

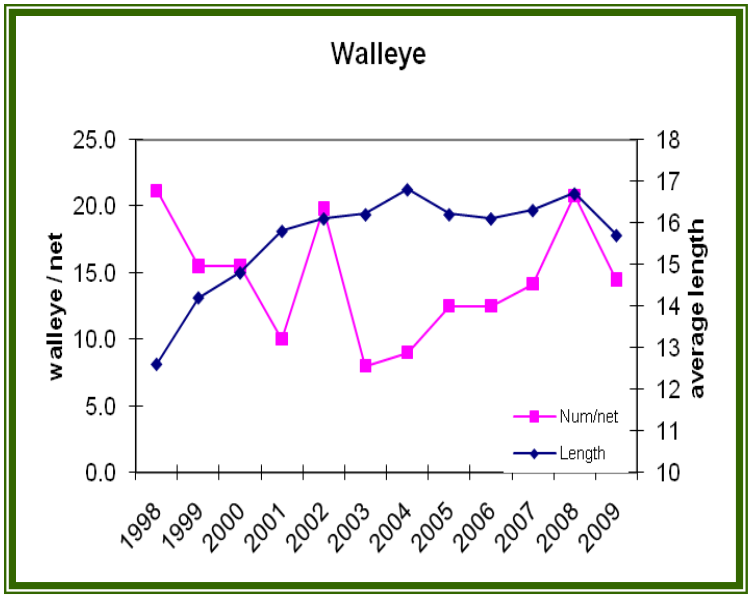
Boysen Reservoir

Fishing at Boysen Reservoir was good for most walleye anglers in 2009, but catch rates for yellow perch, trout and crappie were somewhat lower than in previous years. From angler contacts in 2009, 86 percent of the walleye harvest was 15 – 20 inches in length. Only 1.8% of the walleye harvested were 25 inches or larger. The average length for harvested fish was 17.6 inches for walleye and 20.1 inches for trout.

Each year in September, the WGFD samples walleye in Boysen Reservoir with nets set in standard locations to assess density and size structure. Trend data show that walleye catch in nets has fluctuated from a low of 8 fish per net in 2003 to a high of 21 fish per net in 1998 and 2008 (See Figure). Catch this year dropped to less than 15 walleye per net. If you read last year's newsletter you may recall that this drop in walleye numbers was predicted, due to declines in yellow perch abundance. Boysen Reservoir walleye, especially the medium and larger fish, depend heavily on perch for food. The recruitment of yellow perch continues to be much less than expected considering the good reservoir storage and flooded terrestrial vegetation. We may continue to see declines in walleye numbers until the number of perch in the reservoir rises.

The mean length for walleye captured in nets has increased considerably since 1998 when mean length was 12.6 inches. In 2009, mean length of netted walleyes decreased from 2008, but at 15.7 inches was still above average for the past several years.

The condition of walleye, measured by a relative weight index, decreased in 2009. In other words, the walleye were not finding as much to eat and were slimmer than in the preceding years. Relative weights of walleye should increase when yellow perch populations rebound. Until then, poor forage conditions may lead to higher catch rates, as walleye are forced to feed longer in search of food.



Mean catch rates and length for walleye captured by the WGFD's standardized gill netting program in September (1998-2009) at Boysen Reservoir.

The WGFD stocks around 50,000 rainbow trout per year in Boysen Reservoir. These fish are stocked in the fall at an average size of about 9 inches. Trout of this size are able to avoid being eaten by all but the larger walleye, and during the fall the walleye feed less than in spring or summer. This strategy, therefore, maximizes the survival of stocked trout. The trout fishery continues to provide excellent opportunities to bank anglers during spring and anglers fishing through the ice during winter. During summer, when water temperatures are warm, trout move off shore and become more difficult to catch.

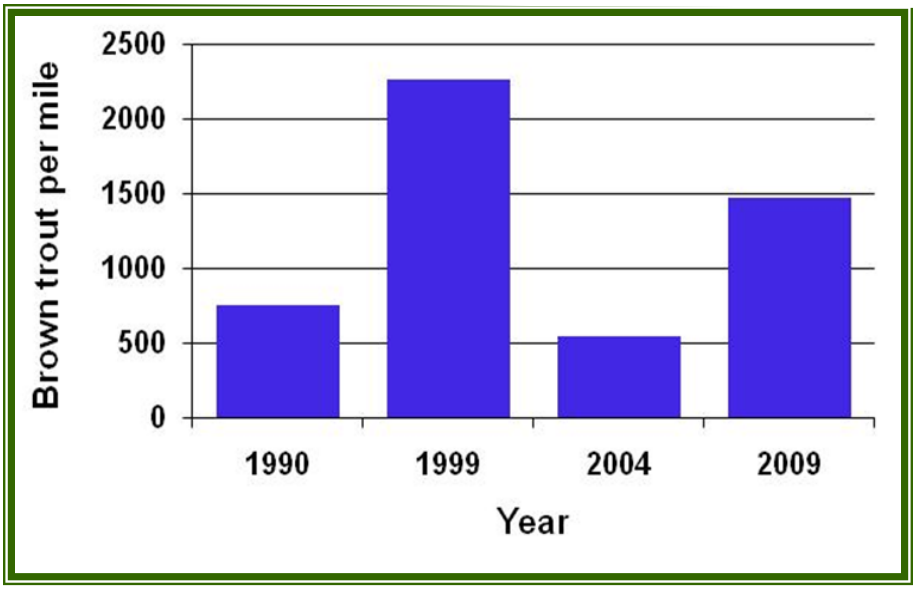
North Fork Popo Agie River

During the second week in October, fisheries biologists from the WGFD and the U.S. Fish and Wildlife Service (USFWS) conducted a fish population estimate at the public fishing access of the North Fork Popo Agie River. This population estimate is a cooperative effort between the two agencies because the North Fork Popo Agie River is the boundary of the Wind River Reservation, on which the USFWS assists with fish and wildlife management. The fishing access is approximately 2 ½ miles north of Lander and provides excellent trout fishing just a short drive from the town. The fishing access itself is approximately 1.75 stream miles on the north and east sides of the river (the reservation side). The population estimate at this public fishing access is conducted every five years to monitor the state of the fishery.

Large brown trout captured at the North Fork Popo Agie River public fishing access north of Lander in October 2009.

To conduct the population estimate, fisheries biologists floated 1.1 miles of the river using a raft fitted with electrofishing equipment. This electrofishing was conducted on the same 1.1 miles of river 3 different days during a one-week period. Each captured fish received a unique fin clip corresponding to the day it was captured. That way, biologists would be able to identify fish that were recaptured and would know on which day it was captured. By counting the total number of fish captured and the number of fish that were recaptured during the three days of electrofishing, biologists were able to obtain a good estimate of the number and pounds of trout in that section of the North Fork Popo Agie.

Results from the population estimate showed high numbers of fish in the North Fork Popo Agie River at the public fishing access. Estimates were approximately 1,500 brown trout per mile, and 700 pounds of brown trout per mile. This was almost a three-fold increase from the 2004 population estimate of 550 brown trout per mile (See Figure). Various sizes of brown trout were observed, and 16 % were greater than 15 inches. The biggest fish captured was a brown trout measuring approximately 27 inches and likely weighing 8 or 9 pounds. Good opportunity also exists for anglers to capture mountain whitefish at the public fishing access. The population estimate for whitefish was approximately 50 fish per mile, and whitefish averaged almost 15 inches in length. Rainbow trout are currently rare in this area of the North Fork Popo Agie. Population estimates were once greater than 300 rainbow trout per mile in 1990; however, the introduction of whirling disease to this river has virtually wiped out the rainbow trout population. Only four rainbow trout were captured during the 2009 sampling event, which was not enough to even calculate a population estimate. Despite the lack of rainbow trout, the North Fork Popo Agie River provides Lander area residents and visitors with an excellent fishing resource with high numbers of brown trout.



Number of brown trout per mile in the North Fork Popo Agie River at the public fishing access area north of Lander from 1990 – 2009.

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WE'RE ON THE WEB
http://gf.state.wy.us/

During 2007, the Game and Fish Department implemented a new Stop Poaching tip line designed to help crack down on illegal hunting and fishing activities in the state. The new number, (877) WGFD-TIP will handle wildlife violation tips in a more efficient manner. We wanted a new number that was easy to remember so hunters and anglers out in the field could report violations immediately.

Illegal transplanting or stocking of fish has been particularly devastating to important fisheries in recent years. We need your help watching for these violations and reporting them as soon as possible.

Citizens should be alert and gather as much specific information about the violation as possible. Try to document the date, time, location and specific nature of the violation. Include a physical description of the suspected violator or include contact information if possible, as well as a license plate number and description of any vehicles involved in the incident.

Middle Depression Reservoir

During 2009, water temperature and dissolved oxygen (DO) levels were measured at Middle Depression Reservoir to assess summer condition in response to concerns that trout summer-killed due to poor water quality or environment stress. This reservoir, which has provided some fabulous rainbow trout fishing in the past, has experienced some major problems over the past few of years. Generally the critical time of year for trout survival in this water has been the winter. The reservoir is shallow and in the past, during the ice covered period of the winter, oxygen levels would drop to the point that trout would die. The Game and Fish overcame this problem many years ago by installing an aeration system that prevents total ice formation and allows for oxygen exchange. However, conditions in the reservoir have changed over the past few years. There is less water in the system due to drought and more efficient irrigation practices. Also, the amount of vegetation has been steadily increasing in the reservoir. As a result it appears that we have experienced summer-kill conditions the past two or three years. This results during warm, calm, cloudy summer evenings when the plants are not photosynthesizing, but rather consuming oxygen. This can cause a dip in dissolved oxygen levels low enough to be lethal to trout.

During July and August sampling, DO was at or near lethal levels for trout near the bottom before sunrise, but levels near the surface remained within acceptable levels. The lower benthic DO concentration during late summer is normal and is caused by warm water, longer nights and increased plant density. Surface DO rebounds quickly at sunrise and receives diffusion of atmospheric oxygen. Although DO reached levels that could cause mortality for most fish species in the reservoir, the DO profile shows that fish could survive if they remain near the surface during the night.

Water temperatures were also recorded with a temperature logger every 15 minutes in Middle Depression Reservoir from June through October to investigate potential causes for summer kill of trout. The temperature logger was placed approximately 15 feet from shore at a depth of 2 feet. The maximum temperature recorded was 80°F on July 26, 2009. Average water temperature for the month of July was 72.4°F, while August had an average of 69°F. Throughout July and August daily fluctuations remained steady at 7-9°F between the recorded low and high temperatures. Temperatures are approaching the upper limits for trout survival, so monitoring will continue to keep close watch on conditions at Middle Depression Reservoir.