Wyoming Game and Fish Department

2005 Edition

Volume 1, Issue 2

Pinedale Region Newsletter

Titcomb Basin, photo courtesy US Forest Service

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Matt Kondratieff (Fisheries Biologist)

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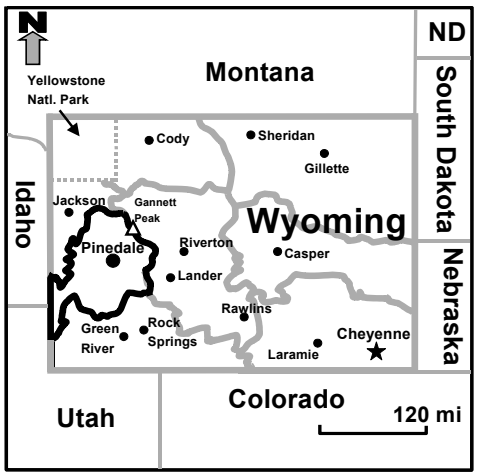
Welcome Interested Public!

This newsletter is designed to inform interested public of the activities of the Wyoming Game and Fish Department's Fish Division within the Pinedale Region. The Pinedale region encompasses the upper Green River Drainage (upstream of Fontenelle Reservoir) and parts of the Bear River drainage around Cokeville (see map).

It is our intent to produce up-to-date newsletters each year to keep you informed on findings, progress, and recommendations from the previous year. This newsletter is intended for everyone interested in the aquatic resources in the Pinedale area. The resources we manage belong to all of us.

We hope you find this newsletter useful and informative. Please direct any feedback that you may have or suggestions for improvements to the contact listed on the back page of this publication.



WGFD Regional Map: Pinedale Region outlined in black

Soda Lake Trout Populations Impacted by Drought

Pete Cavalli
Fisheries Biologist

Many anglers who tried their luck at Soda Lake in 2004 were disappointed with the number of fish they caught. Unfortunately, the outlook for 2005 is not any better. Trout numbers in Soda Lake were at a record high in 1997, but extended drought conditions have caused a steady decline in the fish populations. In fact, population estimates calculated in the fall of 2004 show that trout numbers are now as low as any numbers in the past 30 years. In 1997, Soda Lake held over 46,000 trout, while fewer than 2,000 trout now inhabit this water (Figure 1).

Soda Lake is relatively warm and shallow, and has unusual water chemistry characteristics that allow trout to grow rapidly. However, these same factors, when combined with low water levels, are probably responsible for the trout die-off. Historically trout were stocked in Soda Lake, but those early efforts were not successful. In 1952, a biologist recommended elimination of the stocking program in Soda Lake because of poor survival of the planted fish. In 1953 habitat conditions appeared to be more suitable for warm water species than for

> "Trout numbers in Soda Lake were at a record high in 1997, but extended drought conditions have caused a steady decline in fish populations."

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Soda Lake (cont.)

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trout. As habitat conditions improved, survival of trout also improved, and a tremendous fishery developed. However, fish kills occurred again in the 1960s, 1978, 1983, 1991, and during the years following the turn of the century.

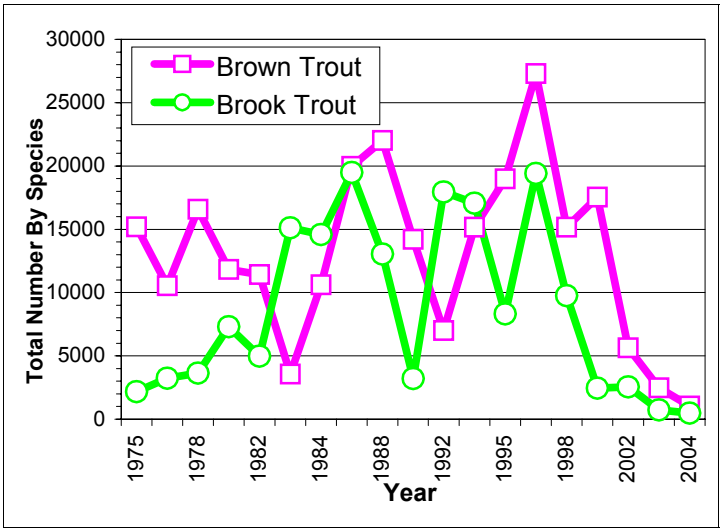

Figure 1. *Brown trout and brook trout population estimates in Soda Lake. Population estimates were not calculated every year.*

The water level in Soda Lake is currently several feet below its high-water mark, and habitat conditions have suffered as a result. Hot summers have caused water temperatures to be warmer than normal, which is harmful to the trout. In addition, warmer temperatures have allowed algae and other aquatic plants to become more abundant. The plant biomass dies off and decomposes in the fall and winter, removing oxygen from the water. Eventually, this can drive the oxygen concentration down far enough to kill trout, and it appears that has happened during the past few winters. Dissolved oxygen concentrations below 5 parts per million cause increased mortality in trout. In addition, the fish that survive will not grow in these conditions. Dissolved oxygen concentrations in Soda Lake have been below this level throughout the water column in two of the last four winters. During the other two winters, only the upper five feet of water had at least 5 parts per million of dissolved oxygen.

High temperatures and low dissolved oxygen levels are both stressful conditions for trout. Increased stress has allowed a bacterial disease known as Furunculosis to develop (Figure 2). This disease was first detected in Soda Lake in 1993, but was not seen again until 2002. Severe outbreaks of this disease have been seen in each of the last 3 years, and have undoubtedly caused some mortality.

Anglers have suggested that the low numbers of trout now found in Soda Lake were caused by factors related to wetlands that were built above the lake beginning in 1988, or by pollution from boat motors. However, there is no evidence to support either of these claims. Analysis of factors related to water quality showed that the wetlands only changed the temperature of water entering Soda Lake by less than one degree, and evaporative loss from the wetlands is minimal. In addition, trout numbers in Soda Lake were at a record high in 1997, which was long after the wetlands were built. If the wetlands were a problem, that record would not have been possible. Analysis of water chemistry and sediments in the 1990s showed that concentrations of petroleum products were not high enough to affect trout in Soda Lake. In addition, the use of outboards has been eliminated during the month of May, and new motors are cleaner than the old ones, so the effect of outboards is probably even lower now. Therefore, neither pollution nor the wetlands appear to be the cause of the trout number decline.

One new development that will undoubtedly impact the fishery in Soda Lake is the illegal introduction of several species of non-game fish. Fathead minnows, redside shiners and speckled dace all showed up in the lake in the 1990s, and a white sucker was captured in 2004. Bait fishermen probably released all of these species, and they will all compete with trout, to some extent. Unfortunately, it does not appear that trout are foraging on these species, and there is no good way to eliminate them from Soda Lake.

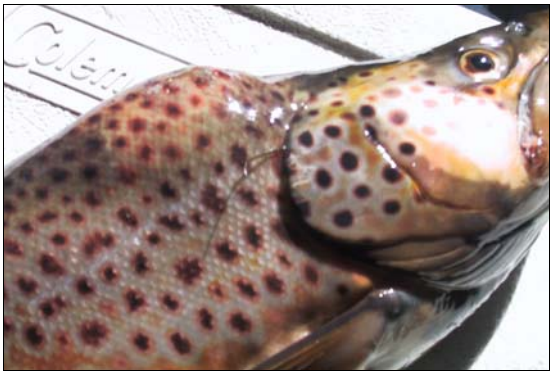

Figure 2. *A brown trout from Soda Lake showing signs of the bacterial disease known as Furunculosis. Note the large bump behind the head.*

Anglers have asked for additional stocking to increase trout numbers in Soda Lake. But stocking more fish would not help the problem, since the loss of trout was caused by poor habitat conditions. The number of trout stocked has actually been reduced temporarily because of the poor habitat conditions. Historically, Soda Lake has been stocked with small trout in June. This regime was altered in 2003 in an effort to improve survival of the planted fish. The new stocking regime involves stocking some fish in the fall. Initially it appeared that survival of those fish was higher than those planted in June, but neither group of fish survived well during the winter of 2003-2004.

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North Piney Lake Spawning Operation

Pete Feck
Spawning Specialist

"A typical spawning operation at North Piney Lake will last about 7-10 days."

North Piney Lake, located about 25 miles West of Big Piney, Wyoming in the beautiful Wyoming Range, contains a healthy population of genetically pure Colorado River cutthroat trout (*Oncorhynchus clarkii pleuriticus*). This particular population of cutthroat trout is very important to the Wyoming Game & Fish Department's (WGFD) fish restoration program.

The WGFD wild fish spawning crew has ventured to North Piney Lake to gather eggs from this wild brood stock for the past two years. These eggs are used for two purposes: stocking of Colorado River cutthroat trout into their native drainages and to establish a western captive brood stock at the Daniel Fish Hatchery. Daniel Fish Hatchery is located 13 miles north of Pinedale. Spawning crew personnel collected 54,096 eggs in 2003 and 57,734 eggs in 2004 to ensure the previously stated purposes would be accomplished. WGFD personnel will continue to spawn at North Piney Lake through 2008.

North Piney Lake

Colorado River cutthroat trout

This strain of cutthroat trout begins spawning directly after ice comes off the lake in the spring, so there is a small window of opportunity to gather viable eggs. WGFD personnel monitor North Piney Lake beginning in mid May. Monitoring is done to get an idea of when the lake will be free of ice. Once the ice clears, a crew and equipment is transported to the lake via helicopter. A typical spawning operation at North Piney Lake will last about 7-10 days. The North Piney Lake fish are shoal spawners, meaning they spawn on the lake shoals rather than in the inflowing or outflowing creek. Trap nets are used to capture adult fish. Once enough fish are gathered, WGFD workers extract the eggs from the females and fertilize the eggs with milt from a male. The eggs are placed in small coolers and allowed to water harden for a few hours. Water hardening is the natural process of a fertilized egg absorbing water. This key step must occur prior to egg transport from the spawning site in order to protect fertilized eggs from the shock of transport. Once the eggs are water hardened they are taken to the Auburn Fish Hatchery near Afton, Wyoming. At Auburn they are placed in an isolation facility where they are raised to about 2 inches. These fish are then sampled to meet disease certification criteria prior to transferring them to the Daniel Fish Hatchery. At Daniel, some of the fish are used as captive brood stock while others are stocked into appropriate waters in the State.

Helicopter used for hauling personnel and equipment

Please feel free to drop by the Daniel Fish Hatchery during their regular visiting hours, 8:00 AM-5:00 PM daily, if you would like to take a look at the North Piney Lake Colorado River cutthroat trout. Just a reminder, special regulations apply to North Piney Lake. It is closed to fishing from June 1 – July 15 and use of internal combustion motors is prohibited.

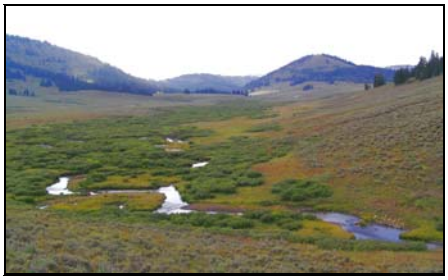
Soda Lake (cont.) Some anglers believe that a catch-and-release regulation should be implemented at Soda Lake. Others think the lake should be closed to fishing until conditions improve. However, the majority of anglers interviewed in 2004 did not support a reduced limit or closing the lake to fishing. The Wyoming Game and Fish Department considered all options, but decided against changing the current regulations because habitat conditions, rather than harvest, are the cause of the decline in trout numbers. We have explored several options to improve water quality, and trout numbers, in Soda Lake. For a variety of reasons, none of these options have been feasible. Most likely, the only thing that will bring trout numbers back up to the levels recorded in the 1990s is higher water levels. Snow pack was below normal again last winter (2004-2005), so anglers should be prepared for slow fishing at Soda Lake in 2005.

Restoring Colorado River Cutthroat Trout

Hilda Sexauer
Regional Fisheries Supervisor

Colorado River cutthroat trout

Increased emphasis on native cutthroat trout management and locating good Colorado River cutthroat trout populations in some of the tributaries to LaBarge Creek provided impetus to change the management direction in the LaBarge watershed to native cutthroat trout. An extensive Colorado River cutthroat trout restoration project in the headwaters of this watershed began in 2000. The project area includes all waters approximately 1.5 miles upstream from the Big Fall Creek confluence. This totals about 58 stream miles of habitat that will be managed for Colorado River cutthroat trout and native nongame fish species.



LaBarge Creek meandering through LaBarge Meadows

LaBarge Creek flows for approximately 50 miles, beginning in the Wyoming Range on U.S. Forest Service (USFS) land at an elevation in excess of 10,000 feet. It exits the Forest at an elevation of 7,700 feet and enters a mixture of Bureau of Land Management (BLM), State, and privately owned lands. This watershed entails approximately 121 stream miles. The watershed is typical montane habitat with conifer/aspen slopes that change to sagebrush/grass slopes near the riparian zone. Willows and grasses comprise the riparian zone throughout most of the creek's length.

Antimycin drip station

Wyoming Game and Fish Department fish managers began removing nonnative fish species from LaBarge Creek and its tributaries in 2004 and will continue this process again in 2005 and 2006. Two piscicides (fish toxicants) are used during the treatments: antimycin and rotenone. The primary piscicide used is antimycin. These chemicals have been used successfully in many stream restoration efforts and have proven highly effective at removing unwanted fish species from aquatic systems.

Removal of unwanted fish species will continue for the next 2 years, with plans to restock with native cutthroat trout, as well as other native fish species, in 2007. The project area will be managed for a fishable Colorado River cutthroat trout population. The waters below the project area will be managed as a nonnative and native sport fishery.

LaBarge Creek fish migration barrier

For more information about the Colorado River cutthroat trout restoration project on LaBarge Creek, or for suggestions of alternate recreational locations, contact Hilda Sexauer at (307) 367-4353.

Golden Trout: Where to Fish in the Winds

Matt Kondratieff
Pinedale Fisheries

The Wyoming Game & Fish Department will be re-stocking a number of alpine lakes statewide with golden trout (*Oncorhynchus aguabonita*) for the first time in 10 years. Eggs were obtained in July, 2004 from Grave Creek Lakes (see Pinedale Region Newsletter, vol. 1:1). Thousands of golden trout fingerlings will be planted by helicopter into seven alpine lakes within the Pinedale Region. These lakes will be planted with golden trout every other year. Once fish have been stocked, golden trout populations will be monitored to determine the success of each plant. All lakes selected for fish planting have historically supported golden trout populations, but do not have suitable habitat for sustaining naturally reproducing populations. Fish will take 2-3 years to grow to catchable sizes.

Wind River Range golden trout

The following lakes will be stocked with golden trout this summer: Jim Harrower Lake, Mistake Lake, Peak Lake, Stonehammer Lake, Titcomb Lakes # 4 and 5, and Upper Sweeney Lake.

For more information about where to go fishing for golden trout in the Wind River Range, contact Hilda Sexauer at the Pinedale Regional Game & Fish office @ (307) 367-4353.

Boulder Lake Kokanee Salmon

Pete Cavalli
Fisheries Biologist

If you were to ask anglers to tell you about the fishery in Boulder Lake, most of them would describe the abundant lake trout population that has produced numerous trophy-sized fish. A few others would talk about the big rainbows that can be caught in this lake. However, relatively few anglers would mention kokanee salmon, which is another species that makes up an important part of the Boulder Lake fishery.

A mature Boulder Lake kokanee salmon

Kokanee salmon were first stocked in this water in 1984, and the Wyoming Game & Fish Department began using this population as a brood stock (a source of fertilized eggs) in 1993. Some kokanee populations in Wyoming spawn in September, while others spawn in November. "Early-run" kokanee tend to move into a stream to spawn, while "late-run" kokanee tend to spawn within the lake where they spend their entire life. Boulder Lake provided the state of Wyoming's only late-run kokanee brood stock, and fish raised from eggs collected there were stocked in several other lakes around the state. Therefore, this brood stock has been important both regionally and statewide.

The number of kokanee in all populations tend to fluctuate through time, but the number of kokanee eggs collected from Boulder Lake has declined steadily since 2000. Unfortunately, the demand for late-run kokanee in Wyoming has been higher than the number that has been produced. Additional fish were stocked in Boulder Lake in an effort to produce more eggs. However, the number of eggs collected in 2003 was the lowest on record, even though the stocking rate had doubled since the egg-taking operation began. Due to the declining egg take and other factors, no effort was made to collect eggs from Boulder Lake in 2004.

The reason(s) for the decline in the number of kokanee salmon captured is not known, but two potential causes were identified. One possibility was that lake trout were eating most of the kokanee. Another possibility was that Boulder Lake was not producing enough zooplankton (the primary food item eaten by kokanee) for kokanee to eat. The Wyoming Game & Fish Department's Reservoir Research Crew (now a part of the Aquatic Assessment Crew) and the Pinedale Region's Fish Management Crew initiated a study in 2004 in an effort to determine why the kokanee population is in decline.

One of many large lake trout captured during the kokanee salmon study conducted in 2004.

Several types of data were collected to help us figure out what is happening to the kokanee population. First, information was collected on the lake trout and kokanee salmon populations. The number of each of these species inhabiting Boulder Lake was estimated with hydroacoustic gear (a scientific version of the "fish finders" used by anglers). In addition, the diets of both species were examined by looking at the food items found in their stomachs. Fortunately, we are able to remove the stomach contents without killing the fish, so most of the fish captured were released alive. However, a few fish were sacrificed so that we could determine the age of each size class of fish. This was done by removing a small bone (known as an otolith) from the fish's head and examining it under a microscope. Otoliths grow quickly during the summer and slowly during the winter, and these differences in growth patterns are fairly easy to see. The patterns are similar to tree rings, and a fish's age can be determined by counting the rings in the otolith.

A happy angler with a nice Boulder Lake rainbow trout .

Information about zooplankton (tiny invertebrates that live in water) abundance and the habitat characteristics of Boulder Lake was also collected. These data will be combined with information from the fish populations using bioenergetic modeling. This technique will allow us to estimate the number of kokanee that are being eaten by lake trout and estimate the amount of zooplankton that is being consumed by kokanee and other species of fish.

Results of the study are not yet available, but several interesting facts were noted

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Little Soda Lake: Are Big Rainbow Trout Still Here?

Hilda Sexauer
Regional Fisheries Supervisor

"The fish we stock in May average 8 inches. By October these fish average 15.5 inches, ranging from 12.5 to 17.8 inches."

From 1998-2000 Little Soda Lake was providing an excellent rainbow trout fishery, producing rainbow trout that exceeded 26 inches and 6 lbs. Since 2001, we have not collected any fish during our spring sampling. In 2002 we began sampling in the fall to determine if we had summer survival, and if so, how big the fish were. Based on results from the past 3 years, Little Soda provides excellent summer growing conditions for rainbow trout, but over-winter conditions continue to be problematic (Table 1).

A big rainbow trout from Little Soda Lake

Little Soda Lake covers 62-acres and has a maximum depth of 56 ft. It is located on the National Forest between Soda and Fremont Lakes. The lake is fed by snowmelt through two intermittent streams and has an intermittent outlet to Fremont Lake. A chemocline occurs at about 30 ft preventing mixing. A chemocline is defined as the vertical segregation of water masses into distinct layers as a result of differences in water chemistry. The chemocline develops from a lack of inflow/outflow and wind action. Toxic levels of hydrogen sulphide are found below the chemocline and cause fish mortality when wind mixes the water after ice-out. In the last 15 years, winterkills occurred in two years during the early 1990s and again during ice-off of 2001- 2005.

The lake has been stocked with various fish species over the years to determine which species is best suited for the lake. Beginning in 1997, 1,000 catchable rainbow trout have been stocked annually to provide immediate fishing opportunities independent of winter survival.

Table 1. Netting results for Little Soda Lake 2002-2005

Year	Month	Length Range (in)	Weight Range (lbs)
2002	May	No fish captured	No fish captured
2002	October	14.8-16.5	1.13-2.25
2003	May	No fish captured	No fish captured
2003	October	12.5-16.5	0.98-1.94
2004	April	No fish captured	No fish captured
2004	October	14.3-17.8	1.33-2.25
2005	May	No fish captured	No fish captured

The fish we stock in May average 8 inches. By October these fish average 15.5 inches, ranging from 12.5 to 17.8 inches. This lake used to be popular among both local and out-of-state anglers. However since 2001 angler use has declined greatly. We encourage anglers to continue fishing in spite of current drought conditions which limit over-winter trout survival. Even though the fish we stock may not be making it through the winter they are still providing a good rainbow trout fishery during the summer and fall.

Boulder Lake Kokanee Salmon (cont.)

(Continued from page 5)

during the course of the study. First, zooplankton appears to be very common in the diets of both kokanee and lake trout. This was to be expected for kokanee and small lake trout, but a surprising number of large lake trout were also exploiting this food source. The availability of zooplankton tends to vary dramatically through the course of a year, and this pattern was evident at Boulder Lake. Fortunately, it appears that we have been stocking kokanee during the period when zooplankton is abundant. We did find several kokanee in lake trout stomachs, but that was only the case for a few weeks after the fish were stocked. Because late-run kokanee have not been doing well in Boulder Lake, and working conditions are less than ideal during their spawning season, we recently decided to stock early-run kokanee in this lake. Hopefully, the early-run fish will thrive and produce another source of eggs for this valuable strain. We will also try to collect some late-run kokanee eggs from Flaming Gorge Reservoir, and obtain additional eggs from other states. Neither of these options is guaranteed to be successful, so we may have to rely on early-run kokanee for all future stocking efforts. Regardless of which strain is available or where they are produced, we plan to continue stocking this species in Boulder Lake for the benefit of Wyoming's anglers.

Huston Public Fishing Access Area

Floyd Roadifer
Aquatic Habitat Biologist

To improve public access for fishing, hunting, and boating, the Wyoming Game & Fish Commission purchased 30 acres from Alan Huston in May 2000. Huston Public Fishing Access Area is located on the Green River, approximately 9 miles southeast of Pinedale. This land purchase is a success story of what can be accomplished when private land owners and state wildlife agencies come together under the common goal of protecting and enhancing our wildlife resources.

Prior to constructing the Huston Boat Ramp, it was necessary to make sure the river did not cut a new channel upstream. If this had happened, the proposed boat ramp and the Ada Ditch irrigation diversion would have been abandoned. To prevent this separation from occurring, a rock sill and two vortex rock weirs were constructed. The sill and associated bank armoring was placed across the upstream end of the developing channel to regulate the volume of flow and stabilize the channel split. The two vortex weirs were constructed in the developing channel slightly downstream from the sill to function primarily as grade controls and to further regulate the volume of flow.

Once this was completed, we constructed a fence around the access area to control livestock grazing . The fence was connected to another vortex rock weir (see photo below). This structure will serve as a barrier to livestock passage in the river, enhance stream and riparian habitats, and help avoid conflicts for floaters caused by traditional fencing across the river channel. A boat ramp, parking lot, and access road were built also. Finally, a restroom facility was constructed near the parking lot.

The Department paid for the removal of old fence and construction of a new fence in the fall of 2002. We also contributed money to a neighboring landowner through the Department's Riparian Grant Program so he could upgrade his fence and create a 180 acre riparian management pasture. Within the management pasture is a 2.7 acre waterfowl breeding pond that the Department contributed money to through a cost-share agreement. This area is adjacent to a 75 acre exclosure which includes the Department's 30 acre Huston Public Fishing Access Area. The exclosure and management pasture together protect about 1.5 river miles and associated side channels that are important fish and riparian habitat.

Vortex rock weir

> "This land purchase is a success story of what can be accomplished when private land owners and state wildlife agencies come together under the common goal of protecting and enhancing our wildlife resources."

This recently completed access area provides an opportunity for boaters and anglers to access the Green River and enjoy the wildlife and excellent fishery for the first time. From the Huston Access to Sommer's Access is only a 7.0 mile float or you can continue down the river to a primitive take out point at HWY 351. This is 27.8 miles and is considered an all day float. These trips add new options for floaters in the Pinedale area. The following is a summary of approximate float distances between access points on the Green and New Fork Rivers:

Green River:
Forest Boundary to #12 BLM Warren Bridge……..16.5 mi
#12 BLM Warren Bridge to Warren Bridge..……..10.8 mi
Warren Bridge to Daniel Hatchery (40 Rod Access)...7.4 mi
Daniel Hatchery (40 Rod Access) to Daniel..……..9.5 mi
Daniel to Huston…..……..10.6 mi
Huston to Sommer's…….……7.0 mi
Sommer's to Big Piney cutoff (HWY 351)…….…. 20.8 mi
Big Piney cutoff to Upper Fear…… 11.0 mi
Upper Fear to Lower Fear…….……9.5 mi

New Fork River:
Pinedale (Tyler Rd. Access) to Boulder…..……19.0 mi
Boulder to East Fork confluence……..7.2 mi
East Fork confluence to Gas Wells…….. 4.4 mi
Gas Wells to Big Piney cutoff (HWY 351)……..8.4 mi

Wyoming Game and Fish Department

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Fish Division Mission Statement

As stewards of Wyoming's aquatic resources, we are committed to conservation and enhancement of all aquatic wildlife and their habitats for future generations through scientific resource management and informed public participation. We will use an integrated program of protection, regulation, propagation, restoration, and control to provide diverse, quality fisheries resources and angling opportunities. Our efforts will balance the productive capacity of habitats with public desires.

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

Upcoming Features:

Look for these upcoming features in the December 2005 edition of the Pinedale newsletter:

-New Fork Lake kokanee spawning operation

-History of fish planting in the Wind River mountains

-Finger Lake ice fishing

-Bonneville cutthroat trout

-Going for the Cutt-Slam

Beaver help create healthy streams

Matt Kondratieff
Pinedale Fisheries Biologist

With the exception of man, a single beaver can modify its environment more dramatically than an individual of any other species in North America. The presence of beaver in watersheds is beneficial both to streams and other wildlife. Some of the benefits of beaver include: expanding wetlands, elevating water tables, enhancing forage and cover for fish and wildlife, reducing high flows and downstream flooding, storing water to create stable summer flows, retaining sediment and organic matter, increasing aquatic invertebrate production, and increasing aquatic productivity.

Did you know that a beaver family may consume 1 ton of bark during a single winter?

Arguably the greatest benefits of beaver dams for streams are the trapping of sediments above dams and the reduction of stream water velocities below dams, which decreases stream bank erosion and aid in nutrient retention. For instance, restoration of beaver to Current Creek, WY reduced sediment transport from 33 to 4 tons/day.

Several studies show that trout biomass and average trout size is greater in streams with beaver ponds than without. Other ways that beaver help fish include: decreasing water velocities, increasing water temperatures (this helps young trout reach large enough sizes to survive overwinter), making ice conditions less severe, creating overwinter/low-water habitat (i.e. deep pools) during severe winters and drought, increasing living space, increasing cover for trout, and moderating water temperature extremes. In rocky, short high-gradient mountain streams, beaver create and maintain fish habitat that would otherwise not exist.

Help us stop the spread of whirling disease!!!

1) Clean all equipment (boats, trailers, waders, boots, float tubes) of mud before leaving rivers or lakes.
2) Don't transport any river or lake water in coolers, buckets, boats, or live wells from one water body to another.
3) Don't transport live fish between bodies of waters.
4) Don't dispose of fish heads, skeletons, or entrails into any body of water. Fish parts should be disposed of in garbage or burned.
5) If you observe symptoms of whirling disease or observe illegal fish transport, contact the Pinedale Regional Game and Fish office (307) 367-4353.