VOL. 2 NO. 1 WINTER 2002

CONTENTS

The Friends of the Teton River is dedicated to understanding and improving ground and surface water resources in the Teton Basin, including the Teton River, its tributaries and wetlands. We will further this mission by conducting scientific research about the Teton watershed, effectively communicating this information to the public, and implementing on-the-ground improvement projects. In carrying out this mission we will actively cooperate and collaborate with all other groups, agencies and individuals working for the welfare of the Teton Basin.

Friends of the Teton River

WATER LINES

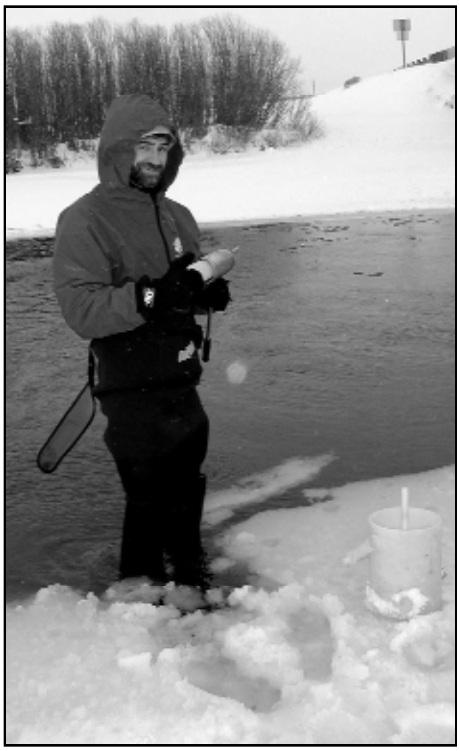
A QUARTERLY NEWSLETTER PUBLISHED BY FRIENDS OF THE TETON RIVER

Fall news from Friends of the Teton River

As the solstice draws closer and the temperatures grow colder, I find myself thinking more and more about winter as the water storage season, when we build up our reserves of the white frozen stuff that will sustain our rivers and creeks through the long summer months.

As all of you know, after two low snow years, this winter's snowfall will be critical to replenishing surface and groundwater throughout eastern Idaho and western Wyoming. Although we can do little about weather patterns (aside from cloud seeding, which is being discussed regionally), we can monitor precipitation amounts and the water equivalent in that snowpack by accessing the excellent Natural Resources Conservation Service (NRCS) site at www.wcc.nrcs.usda.gov/snotel/idaho/idaho.html

On this web page you can choose a location (Pine Creek Pass is the only Snotel site in the Teton Basin) and look at current conditions and how they compare with previous years. On Dec. 10 at Pine Creek Pass we had 8.5 inches of precipitation, 1.5 inches above average; and 4.5 inches of "snow water equivalent" (SWE), which is exactly the historic average for this date. This is encouraging news for our watershed! Snotel sites are maintained by the NRCS and consist of a snow pillow to measure snow depth and SWE, and telemetry equipment to send the data to a central location from which it is transmitted onto the web.



Dave Callery (above) and Lyn Benjamin spent three days in December collecting water samples for tritium age dating and FTR's water quality monitoring program.

That's the snow news... here's some FTR news ...

The Teton Basin aquifer study is progressing well. I've been working closely with the chief scientist, Kristine Ullman, to facilitate data acquisition.

One of the GIS (mapping) team, Dave Callery, came to the valley last week and we spent three days collecting well and spring water samples from all over the valley for tritium age dating. This will provide us with information about hydrologic pathways and residence time for groundwater in the valley. It is important because the age of water lets us know how eas-

-continued on page 2

65 South Main #7
PO Box 768
Driggs, ID 83422
(208)354-3871
FTR@tetontel.com

LAYOUT & DESIGN BY MARY LOU HANSEN, SAGE PRODUCTION &DESIGN

Fall News

-continued from page 1

ily it can be replenished.

Dave and I also took water quality samples for FTR's monitoring program. It was not the perfect week for field work but we did get a lot done!

Results from the winter water quality sampling will be available in the next newsletter.

Henrys Fork Watershed Council held its eighth annual State of the Watershed conference on Nov. 13 and FTR presented results of the water quantity and quality monitoring program. We received many enthusiastic responses to the work we have done over the past year.

At the same meeting John Keyes, Commissioner for the U.S. Bureau of Reclamation (BoR) talked about the current mission of the BoR and about the critically important role that watershed groups like the Henrys Fork Watershed Council and FTR play in natural resource management. Some salient comments from Keyes included: "The next river that we plan to develop is our wastewater" and "Idaho is at a crossroads in dealing with groundwater; while other states recognize the connection between ground and surface water, in Idaho this is still a struggle."

Discussions with farmers and irrigators were organized by FTR board member Boyd Moulton. We visited six farms between Victor and Clawson and listened to farmers discussing changes in irrigation practices, changes in subsurface water and springs, and their observations on the movement of groundwater. We also were given a history of both Trail Creek and the land throughout the valley between the highway and the river. FTR is looking forward to working with these groups to better understand aquifer recharge and develop potential strategies for recharge. Many thanks to Boyd for organizing this field trip, we learned a tremendous amount.

Around the office life has been busy as usual. Our most exciting news is that we hired Marge Edwards as a half-time Development Director. After a month Marge is making great progress in familiarizing herself with FTR and taking our work out into the community.

Thank you to Chi Melville for getting us started on a proper membership database, I'm now on a steep learning curve about databases!

We also have involved FTR member Dave Witton in our GIS project and he will be working to integrate available data into a user-friendly map format. Many thanks to Shana Driscoll for making this possible. A big thank you also to Wayne Ranney for the donation of a slide projector for our educational programs.

On a less cheerful note we received a computer virus from an unknown source and spent three days reconstructing our hard drive, ugh. Check your protection.

On Dec. 20 and 23, ESPN showed a special piece about the Teton River put together by Trout Unlimited and FTR.

Research, monitoring and restoration plans for 2002 are currently being formulated. Teton Springs Foundation and the Community Foundation of Jackson Hole awarded FTR grants towards research and monitoring. We thank both organizations and also the anonymous donor #2002145 through the Community Foundation. We have applied to Idaho Department of Fish and Game for funding for a spawning survey on spring creeks in the valley. We have also applied for funding for a major habitat assessment and restoration project on the Teton River.

Any contributions towards these projects will be greatly appreciated.

FTR's Water Quality Forum on Jan. 16 at the Teton High School promises to be extremely informative. We have speakers from District 7 Health District, DEQ, U.S. Geological Survey, Cascade Earth Sciences, Natural Resources Conservation Service, and Alsea Geographics lined up to talk about subjects including septic and sewer systems, soil suitability for septics, nitrate studies in

-continued on next page

The 2001 Teton River fishing season

By Randy Berry
President, FTR Board of Directors

The past year saw many difficulties on the Teton River and in the Teton watershed.

Following two years of drought conditions, the river suffered from extremely low flows in 2001. In my 42 years of guiding, this was only the second time I have seen such low water. There was absolutely no high water run-off in the spring and early summer. Historically, this peak flow not only helps flush silt down the river but also dislodges food and grasses from the river bottom that provides important nutrients for fish coming off their winter fast.

The silt problems of the past three seasons continued due to the fact that there was not enough flow volume or velocity to transfer the fine sediments down river.

The good news, however, was that there was a re-growth of macrophytes (grass) in many sections of the river; this grass provides essential homes and food for aquatic insects and fish. The grass is also very important because it backs up water in the river, increasing depth and thereby lowering water temperatures throughout the season.


George Geiges with a five pound rainbow.

Fishing on the Teton River this past season was spotty. Without the high water run-off, the river ran clear by mid June. Because of low water conditions, the Green Drake hatch did not materialize and most other mayfly hatches also failed to appear on schedule. Additionally, because of the dry conditions, grasshoppers and flying ants failed to hatch in significant enough numbers for the fish to key in on them.

The best fishing occurred in July and September, when temperatures were lower and water was a little higher. Even though the normal hatches did not come off, there was some good nymph activity.

As August arrived and springs began to dry up, we saw more agricultural water use and less water in the river. Fishing suffered as a result. Water temperatures became higher and the fish went down to sulk in the grass where the temperatures were lower and they could find protection from the sun and from predators.

The fish resorted to eating large numbers of snails off the bottom, which is a poor food source for trout because snails are almost impossible to digest and therefore have little food value. During low water, fish feed off the bottom and ignore the surface and even if there is a great hatch the fish will not rise to the surface in low water. As a result, this summer, the fish did not eat the limited numbers of mayflies that did hatch.

Without sufficient water flows most rivers will not provide surface feeding trout during the prime summer season. We saw this condition on all the rivers in our area this past season.

One of the most important factors in high quality fishing is water depth. Too high or too low and the fish go down on the bottom and stay there until conditions improve.

With the good snowpack now in the mountains, we can expect a great fishing season in 2002. If we just have a normal snow pack, we will see better flows than in '01. The precipitation we received this fall helped replenish the springs. Coupled with good snow this winter, the groundwater will be up and in good condition thereby providing more constant flows and great fishing and waterfowl habitat.

More FALL NEWS

-continued from previous page-

eastern Idaho, contaminant transport in the aquifer, drinking water protection, and surface water quality. Everybody is welcome and there will be an extensive question and answer period at the end, so come and have all your questions on these subjects answered.

Our Annual General Meeting at the beginning of November did not have a quorum but thanks to those of you that sent in ballots or attended. We decided to hold the meeting to coincide with our annual river party at the end of June.

In this newsletter we have moved away from the topics of water quantity and quality and have included articles on cutthroat trout and restoration of stream habitat. We included two perspectives on improving stream habitat so that our readers can see the spectrum of possibilities for restoration strategies. We welcome any feedback that you might have about our newsletters and will publish any letters to the editor that we receive.

Six steps for a successful habitat restoration or enhancement project

BY KATIE SALSBURY, FTR Board Member and Owner of Intermountain Aquatics

Intermountain Aquatics, Inc. was started in 1998 by Jeff Klausmann and Katie Salsbury to offer environmental consulting and habitat restoration services throughout the Intermountain West. The goal of our company is to design habitat restoration and enhancement projects that function ecologically and blend aesthetically with their surrounding environment. We begin each of our projects by establishing client goals; whether it is waterfowl or sandhill crane habitat enhancement, trout habitat restoration or enhancement, bank stabilization or upland revegetation, we try to clearly define our client's goals within the context of the functioning environment.

Once the client goals are established, we try to identify what factors are limiting the achievement of those goals. Limiting factors vary depending on historical land use patterns, natural limits in hydrologic, soil or topographic characteristics or a lack of specific habitat types essential for a wildlife species. For waterfowl habitat enhancement projects, limiting factors typically include a lack of open water, wetland vegetation or brood rearing habitat. For fisheries projects, limiting factors typically include a lack of cover, pool habitat and spawning gravels or unstable banks, poor water quality and lack of flows.

Once the limiting factors are identified, we determine whether or not it is feasible to address those factors within the scope of the landscape, land management parameters and the client's budget. For example, creation of open water requires adequate water rights; establishment of new vegetation needs irrigation; and each project requires permits from the appropriate agencies.

If we decide that addressing the limiting factors is not feasible, we will try to redefine the goals so that they can be accomplished or look for a more appropriate location where the limiting factors can be realistically addressed. In some cases, the client's goals are not realistic in the context of what the environment can support and the goals must either be re-evaluated or the project halted to prevent the waste of resources on an unsuccessful project.

Katie Salsbury surveying Six Springs Creek, June 2001.

After the goals and limiting factors are identified to be feasible, we design a restoration or enhancement plan that includes construction techniques to create specific habitat components. The plans are then submitted for permitting and on approval the project is started.

Many people believe that a project is finished after construction, however, three major steps remain. Revegetation is a primary component of each project. After construction, exposed ground is revegetated with appropriate native vegetation for specific wildlife species. If projects are not revegetated, aggressive weeds will colonize immediately on site and compromise any wildlife goals. Upon project completion, monitoring and maintenance are also essential. Irrigation, weed control and fencing are all components typically incorporated into projects after completion. Monitoring is conducted to evaluate each project and identify what, if any, adjustments are necessary to insure success.

Establishment of goals, identification of limiting factors, feasibility research, design, permitting, construction, revegetation, monitoring and maintenance are all components that should be included in order to insure long-term success of any habitat restoration or enhancement project.

- ✓Establish goals
- ✓Identify limiting factors
- ✓Feasibility research
- ✓Design
- ✓Permitting
- ✓Construction
- ✓Revegetation
- ✓Monitoring
- ✓Maintenance

STREAM, HEAL THYSELF: Restoration on Fish Creek

By Lyn Benjamin
Executive Director

Early last summer Mark Harrington stopped by my home on Darby Creek to look at a carpentry job. We started talking and I discovered that he was a neighbor of mine and lived on Fish Creek, which is a small spring creek just south of Darby Creek. As he talked about the work he had done on his land I became curious and asked if I could visit the creek.

A couple of days later I drove through his entrance gate and walked down to the creek. Very little could have prepared me for what I saw. I was used to seeing spring creeks all over the West with heavily eroded banks, silty stream bottoms and very little riparian vegetation.

Fish Creek looked like a textbook illustration of what a healthy spring creek should look like. Lush willows, currant bushes, grasses, and aspens lined the half mile of stream. The streambanks were covered in vegetation and showed little sign of erosion; the stream substrate was composed of some areas of gravel and some areas of fine materials. Mark pointed out a couple of the seven cutthroat trout that had swum up the stream to spawn. Through my astonishment I asked him if it had always looked this way and laughingly he told me that it definitely had not.

When he bought the land ten years ago it was much overgrazed pasture; he says that he nearly didn't buy it because it looked so ugly! The streambanks were eroded and muddy, only mature willows and aspen were present because all the young shoots were regularly eaten, and the bottom of the stream was thick with silt. He decided to stop grazing the property and see if it would recover by itself; the results, ten years later are remarkable.

Fish Creek, June 2001.

There are thousands of four to five foot willows with groves of aspen have growing where previously only single trees were present. The stream bottom now has decent gravel beds where the current is moving quickly but silt still remains in slower areas. Mark says that this new vegetation provides habitat for moose, whitetail deer, and waterfowl.

When he bought the land ten years ago it was much overgrazed pasture; he nearly didn't buy it because it looked so ugly!

Eight years ago he worked with Idaho Fish and Game through the Habitat Improvement Program to successfully establish more waterfowl habitat by creating twenty pothole ponds. He hopes that the rest of the creek between his property and the river can be restored in a similar manner. However, he wisely adds that he realizes how difficult it is for farmers and ranchers to become involved with stream restoration projects when they are struggling to make ends meet and fencing is expensive.

We at Friends of the Teton River want to acknowledge the excellent job that Mark has done on Fish Creek and would like to assist with similar projects that improve stream conditions.

We would also like to point out the outstanding work that is done by the Natural Resources Conservation Service and the Soil Conservation Districts to protect and improve riparian areas. These organizations work directly with landowners through federally funded programs. You can reach them at their office in the Teton Valley at: 354-2680, extension 3.

Yellowstone cutthroat: Native trout of the Teton Basin

When trappers first arrived in the Teton basin, its streams contained a simple assemblage of fish species: a sculpin, a few minnows, and only two representatives of Salmonidae, the fish family containing the salmons, trouts, chars, whitefishes and grayling. These two were the mountain whitefish (Prosopium williamsoni) and the Yellowstone cutthroat trout (Oncorhynchus clarki bouvieri). Today, two nonnative salmonids, brook trout (actually a char, Salvelinus fontinalis) and rainbow trout (Oncorhynchus mykiss), inhabit most of these streams. The combination of nonnative species and habitat degradation and loss threatens the continued existence of cutthroat trout throughout its native range. This article describes the natural history, present status and conservation of Yellowstone cutthroat trout in the Teton drainage.

Depending on which fisheries taxonomist you consult, there are a dozen subspecies of cutthroat trout, give or take a couple. The Yellowstone is one of the most widespread of these subspecies, historically occupying the upper Snake and upper Yellowstone river drainages. The Yellowstone cutthroat evolved from an ancestral salmonid that occupied streams on the western side of the North American continental divide several million years ago.

The existence of the modern-day Yellowstone cutthroat subspecies dates back about one million years, at which time it occupied the entire Snake River system. However, starting about 70,000 years ago, Yellowstone cutthroat were displaced in the middle and lower portions of the system by the more recently evolved redband rainbow trout, which moved upstream into the Snake River system from the Columbia. Shoshone Falls, created by the Bonneville flood about 30,000 years ago, prevented invasion of redband trout into the upper Snake River system and isolated Yellowstone cutthroat above the falls. About 8,000 years ago, following the last episode of glaciation in the Yellowstone region, Yellowstone cutthroat invaded the Yellowstone River drainage via a headwater stream connection in the Two Ocean Plateau area near what is now the southern boundary of Yellowstone National Park.

Cutthroat trout of all subspecies are characterized in appearance by bright reddish-orange slashes of color underneath the lower jaw. Like most inland cutthroat subspecies, Yellowstone cutthroat trout are further characterized by spots that are larger, more round, and concentrated more towards the tail than the spots of rainbow trout. Yellowstone cutthroat coloration ranges from pale golden to crimson red along the sides, with olive on the back.

Cutthroat trout require cold water and plenty of cover to thrive, and thus act as indicators of water quality and habitat conditions. Cutthroat of all ages use woody debris and overhanging banks for cover, although large adults will also use deep pools as protection from predators, the most common of which are birds.

Cutthroat trout are opportunistic feeders, eating a wide variety of aquatic and terrestrial invertebrates and vertebrates. Because of this behavior, cutthroat are more susceptible to angling than other trout species. On the other hand, cutthroat trout populations respond very well to catch-and-release angling management; the rebound of wild Yellowstone cutthroat populations in Yellowstone National Park since implementation of restricted-harvest regulations provides a good example.

Yellowstone cutthroat display three different life histories, referred to as adfluvial, fluvial and resident. In all three life histories, trout spawn in rivers and streams during late spring and early summer, immediately after streamflow peaks from snowmelt runoff.

Individuals in adfluvial populations inhabit lakes, migrating up into tributary streams only to spawn. This life history is rare in the Teton drainage.

A similar spawning migration occurs in the fluvial life history, in which the fish spend most of their time in a large river, migrating into headwater tributaries to spawn. This life history is common throughout its range, including the Teton drainage.

The migratory behavior of fish in adfluvial and fluvial populations offers many long-term survival advantages to these populations. Fish are able to take advantage of abundant food and habitat in lakes, where spawning is not possible, and in large rivers, where spawning habitat may be limited. The timing of the spawning migration allows these fish to access small streams that may contain little or no water the rest of the year. In these types of streams, young trout migrate downstream to the river or lake immediately upon hatching.

Most small streams of the Teton watershed contain cutthroat populations that exhibit resident life history, in which trout spend most of their lives within a relatively small reach of stream, undertaking short seasonal migrations to access optimal habitat. Many of these streams also serve as spawning tributaries for fluvial populations.

Because the Yellowstone cutthroat evolved in isolation from other trout, it is highly susceptible to threats posed by nonnative species, particularly rainbow and brook trout. These species were introduced into the cutthroat's range beginning in the 1870s, when the U.S. Fish Commission promoted widespread stocking of brook and rainbow trout throughout the country. At that time, fisheries biology consisted only of fish culture and propagation, and managers did not know of the havoc their actions would wreak on

-continued on next page

Continued from previous page-

native fish populations.

Brook trout compete with cutthroat for food and cover, particularly in small streams. Because brook trout spawn in the fall, their young hatch in January and February, about four months before young cutthroat hatch. As a result, the young brook trout maintain a size advantage over cutthroat of the same age class throughout their first year of life, allowing competition to favor the brook trout. In addition brook trout mature at a younger age than cutthroat, offering the brook trout a reproductive advantage as well. Brook trout will frequently spawn beginning in their second year, whereas cutthroat may not spawn for the first time until their third or fourth year.

In larger streams, persistence of cutthroat populations is more often threatened by rainbow trout, whose spawning habits and timing overlap with those of the cutthroat. Because the two species are evolutionary cousins, they are able to cross-reproduce in the wild, but this hybridization always favors the more recently evolved rainbow trout. Hybridized populations quickly lose cutthroat trout genetic markers, particularly when rainbow continue to be introduced into the population through artificial propagation.

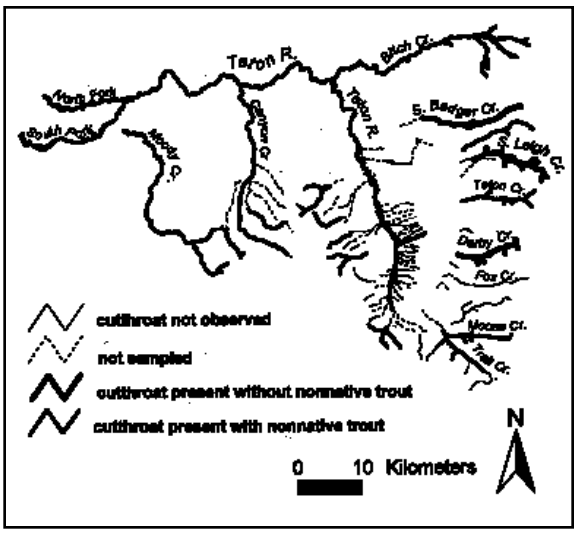
In addition to competition from and hybridization with nonnative trout, cutthroat also suffer from many types of habitat degradation, including siltation, loss of woody debris, dams and other migration barriers, and flow alteration. The negative effects of nonnative trout on cutthroat are often amplified where the cutthroat's historic habitat has been degraded.

Because of nonnative fish introduction and habitat degradation, Yellowstone cutthroat have declined to the point where the U.S. Fish and Wildlife Service was recently requested to list the subspecies as threatened under the Endangered Species Act. Although the request has been denied for now, Yellowstone cutthroat inhabit only about 10 percent of their original stream habitat, most of this occurring in or adjacent to Yellowstone and Grand Teton national parks.

Intensive surveys conducted by the Henry's Fork Foundation, Idaho Department of Fish and Game (IDFG), and the U.S. Forest Service over the past seven years have identified the South Fork of the Snake River from Palisades Reservoir to the Henry's Fork confluence and the Teton drainage as the most important Yellowstone cutthroat strongholds in Idaho.

Particularly when compared with the rest of the Henry's Fork watershed, the status of cutthroat trout in the Teton River system is encouraging. Yellowstone cutthroat occupy about 89 percent of their historic range within the drainage, although nonnative species are also present in most of these streams (see map). Because the Teton drainage historically has received much less attention from the angling and fisheries management communities, far fewer nonnative fish were stocked into Teton basin streams than were stocked in the Henry's Fork. This is probably the primary reason why cutthroat are still widely distributed in the Teton drainage but not in the rest of the Henry's Fork watershed.

In an important step towards preserving the existing cutthroat populations in the Teton drainage, IDFG several years ago stopped all stocking of rainbow trout in the drainage, with the exception of off-stream fishing ponds in the Victor and Rexburg areas. Throughout eastern Idaho, fishing regulations allow harvest of only two cutthroat trout, neither of which may fall inside the 8- to 16-inch size range. This regulation is designed to protect the majority of the most productive spawning-aged fish in the population.



Because of the widespread distribution of cutthroat in the Teton watershed, prospects for cutthroat recovery and preservation are much higher there than elsewhere in its range. As fisheries managers are quickly learning, it is much easier to protect existing populations than it is to re-establish ones that already have gone extinct.

Recovery prospects in the Teton drainage are particularly promising because habitat degradation, rather than presence of nonnative trout, appears to be the primary reasons for decline of cutthroat throughout much of the watershed. Thus, habitat improvement efforts undertaken by FTR and its partners will contribute to cutthroat recovery and protection rather than to simply making habitat better for nonnative trout, as often happens with stream habitat improvement programs elsewhere in the Rocky Mountain region. The combination of improved habitat conditions and fisheries management provides the potential for recovery and long-term persistence of Yellowstone cutthroat in the Teton River and its tributaries.

This article was written by Rob Van Kirk, who says, "I first saw and touched a cutthroat trout when I was eight years old. It was a tiny, orange, black-spotted trout a friend and I caught on a hand-line and a salmon egg in a small neighborhood creek in coastal northern California. Since then, I have spent many days fishing for different varieties of cutthroat trout throughout the west and, more importantly, have spent much of the last six years working to understand and conserve cutthroat trout in the Greater Yellowstone region."

Many thanks to the following individuals and businesses

•Big Hole Music •Jackson Hole Realty •Teton County Wildlife Association •Intermountain Aquatics • Pine Ridge Eye Study Society •Blue Ridge Eye Study Club-West •M.D. Nursery •Stewart Cushman •Erica Eschholz •Victor Emporium •Dana Richardson & Dave Joslyn •David Whitney •William Marckhoff •Sandy & Peter Stern •Robert Legler •Mrs. Robert Senior •Chi & Renee Melville •Chuck & Twina Pitman •Thomas & LeAnn Talbot •Stan & Marge Edwards •Wayne Ranney •Mumford Family Foundation •A grant from an anonymous donor #2002145 through the Community Foundation of Jackson Hole • Barrels & Bins

Attend water quality forum Jan. 16

FTR is sponsoring another public educational forum on Jan. 16, 2002 at the Teton High School. At this meeting seven speakers from Idaho Department of Environmental Quality, U.S. Geological Survey, District 7 Health, City of Driggs, and Cascade Earth Sciences will present information about surface and groundwater quality. They will be talking about topics such as: sewers and septic systems, drinking water systems, nitrates in groundwater, contaminant and bacteria transport, DEQ's surface water quality and sub basin assessment, and the ongoing Teton Valley aquifer study. There will also be an extensive question and answer period at the end of the evening, so we encourage you to bring any questions that you might have for this panel of experts. We at FTR hope that the evening will provide useful scientific and policy-related information about many water quality issues; we also hope that meetings of this kind will engender open and constructive discussions amongst participants.

WATER QUALITY FORUM
January 16 • 6:30 pm
Teton High School
☞Speakers
☞Questions & Answers
☞Free Refreshments

Everybody is welcome and refreshments will be provided!

Membership Application

Name _____ Phone _____ Email _____

Address _____ City _____ State _____ Zip _____

MEMBERSHIP LEVEL:
❑ Student, $5/year ❑ Family, $50/year ❑ Benefactor, $1,000/year
❑ Individual, $25/year ❑ Corporate, $100/year ❑ Additional Gift $_____

❑ Check enclosed

Charge my: ❑ Visa ❑ Mastercard Card No. _____ Exp. Date _____

Signature _____

Members will receive voting privileges, quarterly newsletter, and regular activity updates.
Please send completed application form, with your check or credit card information, to:

Friends of the Teton River
P.O. Box 768
Driggs, ID 83422

Non-Profit Organization
US Postage PAID
Driggs, ID Permit #8

Dedicated to understanding and improving the water resources of Teton Basin.