



Collecting and identifying water bugs on Woods Creek.



Water Education: Fall 2006

Students learn through "Adopt-a-Stream and Pond"

The FTR Education Program kicked off the new school year with over a dozen classroom visits and two dozen trips into the field to teach Teton Valley kids about watershed science in September and October.

The highlighted fall education project involved six classrooms in an "adopt-a-stream and pond" site. The program funding was awarded by an EPA Education grant, which allowed students to study and work on the Blackfoot Farms Wildlife Enhancement Area, and paid for new monitoring equipment and resources. Students learned about the importance of collecting baseline data and using their observations to implement appropriate habitat restoration techniques.

Classes collected a variety of information including water quality, macroinvertebrate life, soil composition, native plant cover, bird habitat and stream functions. Using their observations, students drew and discussed potential plans for the restoration and enhancement of the property. Then, the classes returned to the field to get their hands dirty and put their plans into action. Students planted willows to provide bird habitat and stabilize stream banks, transplanted wetland sod to narrow the width of a degraded stream channel and planted wetland grasses at the pond site to promote a revegetated shoreline.

The classes that took part in this project included Sharon Gusa's fifth graders, the high school environmental science class, two classrooms from the Teton Valley Community School and two from the Learning Academy.

Students learned about the importance of collecting baseline data and using their observations to implement appropriate habitat restoration techniques.

Friends of the Teton River

P.O. Box 768 • Driggs, ID 83422

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Friends of the Teton River works for clean water, healthy streams and abundant fisheries in Teton Valley.

Friends of the Teton River

WATER LINES

A QUARTERLY NEWSLETTER PUBLISHED BY FRIENDS OF THE TETON RIVER VOL. 6 NO. 3 FALL 2006

Land use planning protects streams

This year Friends of the Teton River worked with Intermountain Aquatics to

develop innovative guidelines for development in stream corridors that protect stream and floodplain functional values. Historically, throughout the western USA, after streamside development has occurred, aggressive property protection follows with the use of rip rap (lining stream-banks with rocks), channelization (digging a deeper channel to hold flood flows) or even relocation of the stream channel.

This stream alteration has had devastating impacts on stream corridors and aquatic life; it has also impacted landowners who are frequently left with houses and infrastructure vulnerable to flood events.

The following guidelines were developed to avoid the need for these aggressive measures and to encourage developers to allow flood flows to safely spread through planned developments. The dynamic and ever-changing environment of streams is their greatest functioning value that should be protected. Confined, channelized streams that are not allowed to move and flood become sterile environments that lack the processes necessary to maintain a healthy stream corridor.

Recommendations for Development in Teton Valley Riparian Corridors

✓ *Provide adequate channel and flood plain capacity for the 100-yr flood event.*

-Calculate the channel capacity of the

water body as it flows through the development area.

-Calculate a predicted 100-yr flood event for the water body as it flows through the development area.

-Determine if there is adequate channel capacity for the 100-yr flood event.

-If the channel does not have adequate capacity, design and construct overflow swales throughout the development to allow for adequate movement and storage of the 100-yr flood event.

✓ *Preserve and maintain existing swale and low-lying areas.*

-Complete a detailed topographic survey to identify existing low spots throughout the development area.

-Plan development outside contiguous low spots where water may flow during peak events.

✓ *Maintain potential movement corridors along the creek to allow for future channel migration.*

-Identify likely zones where the creek will continue to meander.

-Identify acceptable distances/thresholds to allow lateral migration of the channel.

-Recommend a covenant in the CC&Rs to allow for lateral channel migration up to a defined location prior to the installation of bank stabilization measures.

FTR has been working proactively with landowners on Teton and Trail Creeks to plan developments that incorporate these guidelines allowing stream channel movement and spreading the flood flows throughout the 100-yr flood plain. Allowing flood flows to spread throughout these develop-

"LAND USE" CONTINUED ON PAGE 8



Looking out on Teton Creek during spring high water, 2006.

Year end report for 2006

➤ PAGE 2

2006 was a record year for FTR in Old Bill's donations

➤ PAGE 3

New Targhee Snotel site will provide data from 9,200' elevation

➤ PAGE 5

Trail Creek projects completed during first year of Open Channels

➤ PAGE 6



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36 East Little Avenue
 PO Box 768 • Driggs, ID 83422
 (208) 354-3871
 ftr@tetonwater.org
 www.tetonwater.org

Year-end report for 2006

Happy Holidays! Thank you so much for your tremendous support in 2006. FTR had a great year. We have the results to show your support was well placed.

Your generosity allowed us to put more dollars into visible results, than ever before. We remained true to our Mission: "Friends of the Teton River works for clean water, healthy streams and abundant fisheries in Teton Valley," and would like to review our 2006 accomplishments in those and other areas.

Clean water. FTR continued to monitor water quality at 12 sites in Teton Valley, and conducted a survey of drinking water quality in wells throughout the valley. We also provided Teton County with a bacteria sourcing study in the Woods Creek area.

Healthy streams. Healthy streams are the focus of our Open Channels program, which over the next several years will involve:

1. Connectivity—improving diversion barriers to connect tributary headwaters to the Teton River;
2. Streamflow—working with landowners, irrigation companies and developers to rewater our tributaries in the late summer; and
3. Streambank restoration—increasing fish and wildlife habitat, decreasing water temperatures and reducing sediment in important spawning areas.

With much-appreciated support from diverse partners like Trail Creek Sprinkler Irrigation Company, Grand Targhee and Targhee Institute, the City of Victor, On the Rocks, Community Foundation of Jackson Hole, National Fish and Wildlife Foundation, U.S. Fish and Wildlife Service private landowners and many others, we recently completed the first phase of a major streambank restoration project on Trail Creek.

Abundant fisheries. This past summer we also completed improvements to fish barriers on Trail Creek near the City of Victor, making it possible for large river trout to swim upstream for spawning. FTR also received U.S. Fish and Wildlife Service funding for diversion improvements on Badger Creek, which will be accomplished (with the

necessary matching funds) in 2007. We remain committed to protecting and improving our abundant fisheries as an important economic and recreational asset for Teton Valley.

Beyond those three core elements found in the Mission, FTR has also had other key strategies evidenced by our 2006 work:

Collaboration. FTR has acted as a catalyst to bring together diverse stakeholders on collaborative projects including a major restoration effort on Teton Creek. FTR has helped put together a working group for Teton Creek restoration that will continue through 2009. Our office has been a busy, and oftentimes crowded, convening space for all the interested Teton Creek parties (including local government, landowners, government agencies, developers and concerned citizens).

Outreach. We reached out in 2006 beyond our watershed for valuable exchanges with others who deal with similar issues. In November FTR hosted its annual Research Committee meeting that includes fishery experts from the Upper Snake River Basin. We have been actively involved with the Jackson Hole Community Foundation and One Percent for the Tetons, participated in informational exchanges with the Upper Salmon Basin Watershed Project group, and presented at meetings such as the Idaho Nonpoint Source Conference, the Henry's Fork Watershed Council, the Teton Science School Wildlife Symposium, and the U.S. Fish and Wildlife Service YCT Endangered Species Act hearing in Bozeman.

Education. FTR's education efforts continued strongly, with the finalization of the K-12 Teton Watershed Education curriculum, involvement with every school in Teton Valley, and classroom, and field trips for over 350 students this year. We also presented a series of five evening watershed education classes for adults at Teton High School.

Enjoying the watershed. And, once again this year, we also took some time to have some fun in the watershed with our members. We celebrated with our 6th anniversary party

"YEAR-END REPORT" CONTINUED ON NEXT PAGE

Figure 2. Woods Creek Isolate Matches

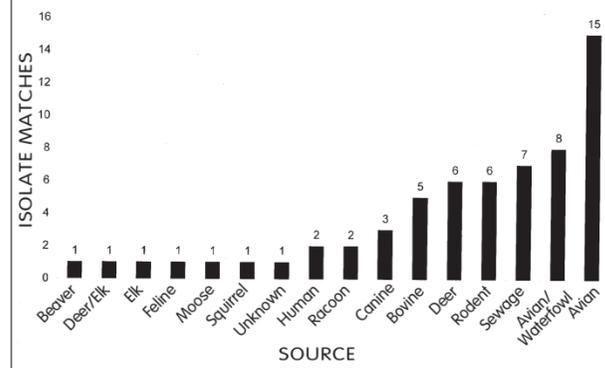
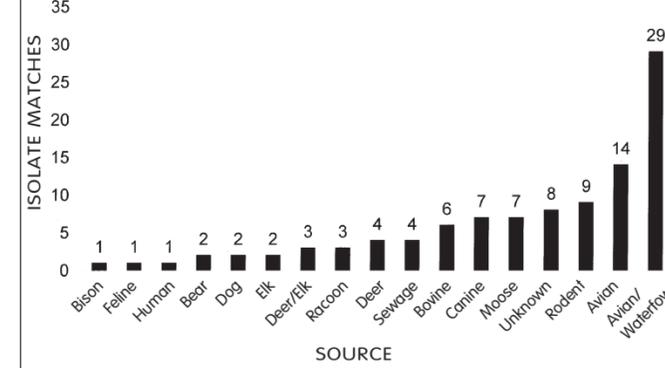


Figure 3. Woods Creek Isolate Matches



E. coli FROM PAGE 2

coli strains isolated from water and source samples by a method of ribotyping modified by Dr. Mansour Samadpour. It is the DNA fingerprint of the *E. coli* that lives within the animal that is typed—not the DNA of the specific animal. Though fecal coliform bacteria found in many animal species are very similar genetically, there are differences among members of the same species that have adapted to live in different host species. It is thought that these distinctions in bacteria occur because the intestinal environments differ between animals, including humans. It is in identifying these genetic differences that it is possible to associate bacteria with sources (human, avian, dog, etc.).

We collected 75 water samples from two sites on Woods Creek and from these samples extracted 174 bacteria isolates that were matched with known bacterial DNA. Results are shown in Figure 2 and 3. For both sites, 66 isolate matches for avian and waterfowl were the highest and 40% of the total. Beaver, bison and squirrel had the fewest isolate matches of one each and less than one percent. Nine isolates or 5% were not matched to any source and were considered unknown. The MST data indicate that both domestic and non-domestic sources contribute *E. coli* to surface water in Woods Creek. A higher total percentage (76%) of the known isolates is from wildlife sources than from humans, domestic pets and livestock (24%). Isolates matching human sources totaled 14, about

9% of total matches.

The results from this 2005 study suggest that the majority of the fecal contamination in the Woods creek drainage originates from wildlife sources. Although domestic sources of fecal contamination were minor, they could still pose a human health risk due to associated pathogens dangerous to human health. In order to reduce domestic fecal contamination to surface waters, specific hydrologic paths for fecal contamination should be identified and management actions applied to individual situations. During 2005, 11% sewage source contribution for *E. coli* was identified at WC-1 so it is clear that the WWTP emitted higher than desirable levels of bacteria at times during the year. It is likely that the large increase in percentage contribution of waterfowl between WC-1 and WC-2 is due to the presence of a large number of waterfowl nesting areas in the Woods Creek drainage.

Because the majority of the fecal contamination originates from wildlife sources stakeholders believe that the low risk to human health does not necessitate remediation actions. However, at this time Nelson Engineering is currently completing the Driggs Sewage Facility Study, which will be made available to the public in November. It is likely that this will incorporate results from this study and address the high chlorine residual levels.

This study was funded by an EPA Regional Geographic Initiative Grant and support from the Cities of Driggs and Victor, Valley Advocates for Responsible Development, and Teton Regional Land Trust.

The results from this 2005 study suggest that the majority (75%) of the fecal contamination in the Woods Creek drainage originates from wildlife sources. Although domestic sources (humans, domestic pets and livestock) were minor, they could still pose a human health risk.



Nearing completion, molds for seating and standing are fiberglassed into place before finishing touches and a paint job.



Tom shows the components for construction: a little cloth and some resin will provide strength to the core.

Building a better boat

Tom Fenger started building his version of a driftboat about 17 years ago. It came as a natural enterprise for this Teton Valley fishing and hunting guide of 30 years, who has spent more of his life in a boat than the average fisherman in a landlocked state.

After repairing wooden drift boats for years, he took up boat building literally seeking to “build a better boat.” Tom recalled how he got started, “I read a book, drew from my experience, made a lot of mistakes and learned from them.”

With the eye of an artist and a craftsman, Tom has sought perfection in what can be considered the characteristic driftboat for the region. With lightweight and durable materials and numerous modifications over the years, Tom has raised the standard for driftboat construction. He uses “sandwich construction,” which layers fiberglass on each side of PVC foam (made specifically for boat hulls). This technique optimizes the boat’s strength to weight ratio, basically offering the lightest and strongest construction possible.

His design places the rower more in the center of the boat than a classic position set towards the stern, allowing the boat to turn on a dime and providing the rower with a better view. He also has widened the bottom for superior floatation and used lighter, stronger materials as they have improved with new technology.

EDITOR’S NOTE: Tom was responsible for starting FTR in 2001 and has served on the Board of Directors since that time. He has guided on the Teton River for the past 30 years and taught many, many people both about the beauty of the river and the wiliness of its fish.



Enjoying a day on the river in one of the early Fenger models!

TOM’S DRIFTBOAT STATISTICS

Length: 16 feet **Width:** 6 feet **Approximate weight:** 320 lbs.

Average hours of crafting time: 100 hours per boat **Number of boats constructed each year:** Anywhere from 2 to 6

Number of boats completed: Over 100 boats

Average cost of materials: \$2,000

The going rate for a basic Tom Fenger drift boat: \$7,000

Where is that first boat now? Somewhere in Oregon.

How many boats will you build after you retire? One, for myself

Your favorite feature of your design: Ease of rowing.

The number of fish caught out of boats you have made: Well, that’s a toughy. Figure about 50 fish a day (in guided boats) x 100 days per season x 100 boats. That would be about 500,000 fish, plus or minus a few that got away.

PRESIDENT’S MESSAGE



Andy Steele,
FTR BOARD PRESIDENT

On a chilly September day I worked alongside another volunteer and FTR’s Restoration Director Mike Lien. As the stream restoration project on Trail Creek grew from planning to a real project on the ground, I was in awe of the science and the hands-on creation of a work of art. I was so moved that I went back at the end of the week to admire FTR’s Open Channel vision and what can be done. I would recommend to each of you to take a drive or bike over to the Brookside Hollow playground and take a look at a good thing for neighbors, the stream, and for fish.

It is with equal enthusiasm that I share with you our good work in educational outreach, water quality monitoring, water measurement, building community support for good land use planning in river corridors, and fish habitat improvement. We continue to support the valley community through good science and collaborative projects.

This good work is accomplished through professional leadership, caring volunteers, and your financial and social support. It has been rewarding to go to Old Bill’s Fun Run and see so many people sharing in the joy of community. I am saddened that our valley’s symbiotic relationship with the Jackson Hole community is being challenged by the future prospect that Teton Valley won’t be part of Old Bill’s Fun Run after 2007. FTR is playing a leadership role in developing options to continue the critical philanthropic link between communities on the east and west sides of the Teton Range. This year, your support of FTR through Old Bill’s has been significant; we had an increase of 19% more people giving to FTR and supporting clean water, healthy streams and abundant fisheries. Thank you.

So, after you read Waterlines, share it with a friend, take them over to the Trail Creek fish passage project across from the entrance to Teton Springs, and think about the future of water and fish in the Teton Valley.

We as a community are making a difference. *-Andy Steele, BOARD PRESIDENT*

Year End Report FROM PAGE 2

on the river. We hosted a full moon Teton River float on a perfect night in August, a dinner for our donor Stewards, a Big Hole Mountains hike and other events. We were reminded, once again, why we live here and how important it is to do what we can to pass on the benefits of the Teton River to the next generation.

The Year Ahead

We have many more plans for 2007 than we could possibly cover in this article, but some key strategies stand out:

Open Channels. Three multi-year projects on key tributaries will continue.

1. Trail Creek—In 2006, FTR started planning and designing additional Trail Creek restoration work that will run through 2009.

2. Teton Creek—We have been visited in our office by many concerned landowners, government agency representatives, local government leaders and developers regarding concerns about flooding, damage to the stream channel, and resulting downstream problems. We’ve hosted meetings, put private citizens together with the right government representatives, brought in additional expertise and, with the help of the resulting coalition, look forward to continuing this huge project in 2007. We’re well into the design phase, have attracted funding and are searching for more, and expect 2007 to be the first of several productive years restoring Teton Creek.

3. Badger Creek—FTR has been working with landowners, Trout Unlimited, Idaho Department Fish and Game, and others to design solutions to old, unsafe irrigation structures that are badly

in need of repair.

Water quality. FTR will continue monitoring surface water quality and working with the county on a proposed drinking water ordinance for new subdivisions.

Education. We will build on our relationships with all of the schools in Teton Valley in 2007. We started a designated fund for education in 2006, and will grow that fund through individual gifts and grants so that our plans, and those of our partner schools can progress beyond the year-to-year stage.

That’s just a summary of some of our more important plans for 2007. We would appreciate your feedback on how we’re doing, and what we have planned. With your interest and support, we can work together for clean water, healthy streams and abundant fisheries.

What's the scoop on the poop?

E. Coli source tracking in Woods Creek

In 2001 Friends of the Teton River (FTR) began a comprehensive water quality monitoring program in the upper Teton watershed. In 2003 and 2004, FTR identified *E. coli* levels in Woods Creek (Figure 1), a tributary of the Teton River, that were above Idaho standards. The Woods Creek watershed is located immediately west of the City of Driggs and is comprised of numerous spring creeks discharging from waters originating as subsurface flows from the Teton Mountains and agricultural recharge to the east of Highway 33. The City of Driggs Wastewater treatment plant (WWTP) is located on the south fork of the unnamed tributaries that combine to create Woods Creek proper. The Woods Creek area is a wetland complex and in the area a high degree of connectivity exists between shallow ground water and surface water. The nature of the Woods Creek fen soils allows bacteria to last longer than in most other types of soil before being broken down by ultraviolet light. Historical land-use has predominantly been cattle grazing; currently the watershed is under plans for development with some areas protected from develop-

ment under land easements. The only potential point source for bacteria in the study area is the WWTP. Potential nonpoint sources include livestock and wildlife fecal matter, leaky septic systems and waterfowl.

In 2003, *E. coli* bacteria counts in Woods Creek greatly exceeded Idaho standards (576 cfu/100mL for an instantaneous reading). Due to the high *E. coli* levels, FTR notified the Idaho Department of Environmental Quality (IDEQ). The IDEQ collected a series of water samples during summer 2003 for which a geometric mean of 659 cfu/100mL was calculated (126 cfu/100 ml is the standard). The geometric mean standard, as opposed to the instantaneous standard, is a useful measurement of the potential human health impact because it represents the average numbers of *E. coli* over a period of time. Woods Creek was placed on a 2004 303(d) list as impaired by *E. coli*.

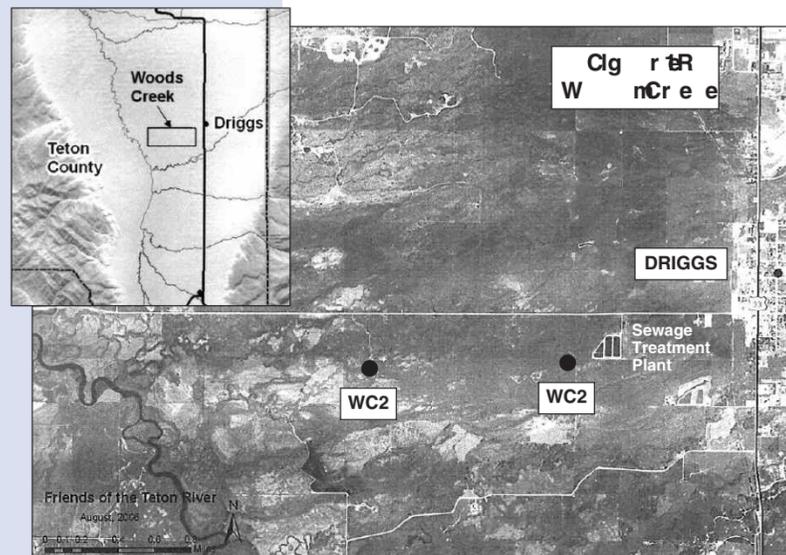
In 2004, FTR cooperated with IDEQ to more intensively sample from April through September for *E. coli* bacteria at multiple locations in Woods Creek.

Since *E. coli* numbers remained high during this period, IDEQ and FTR sampled 12 key sites in August 2004 (5 samples per site in 30 days). This testing allowed FTR and IDEQ to determine a monthly geometric mean for *E. coli* in Woods Creek and the Teton River. The geometric mean calculations revealed elevated and widespread *E. coli* levels in the Woods Creek area higher than the Idaho Standard (the highest mean calculation was 1,032 cfu/100mL).

In 2005, the Bacterial Source Identification project was developed to identify sources of fecal bacteria in Woods Creek. Water quality sampling began in July 2005 and analysis was completed by November 2005. The goal of this project was to identify sources of fecal contamination in the Woods Creek watershed in Teton County, Idaho.

The method used in this project is called Microbial Source Tracking (MST). It is based on the use of a genetic fingerprinting of *E.*

"E. COLI" CONTINUED ON PAGE 11



OLD BILL'S FUN RUN 10

2006 was a record year for FTR in Old Bill's donations, both in number of donors (over 22% increase) and amount given (over 13% increase)! Once again we are amazed at the generosity of all our supporters in Teton Valley, Idaho, Teton County, Wyoming, and around the country. The following donors made Old Bill's 10 a memorable event for FTR: Many thanks to all of you.

- | | | |
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“You’re better off giving the stock itself, not the proceeds from sale of the stock.”

Donating appreciated stocks enhances your gift while providing significant tax advantages

With the general upward trend in the stock market over the past 4 years comes an opportunity to use the Federal tax laws to enhance your year-end gift to Friends of the Teton River (FTR). If you itemize deductions and own stock that (1) Has increased in value since you bought it, and (2) You’ve owned the stock for more than one year, then you can give the stock—versus the proceeds from a sale of the stock—to FTR and make the tax laws work for you.

Here are the general rules for your gift choices (*FTR does not provide specific tax advice; consult your local tax adviser if you have questions*):

1. **SELL THE STOCK AND GIVE THE PROCEEDS TO FTR.** In this situation you have to pay income taxes on the gain—the difference between what you paid for the stock and what you get for it by selling today—and either have less to donate, or have to pay the taxes out of other assets.

2. **GIVE FTR THE APPRECIATED STOCK.** In this case your gift is the full value of the stock today—not reduced by any federal income taxes—and you can deduct that full fair market value for federal income tax purposes.

Let’s look at some numbers in an example. You bought Idaho Oil (not a real company) stock 10 years ago for \$1,000, and it’s worth \$10,000 on the market today. You want to make a significant gift of \$10,000 to FTR today (Thank you, thank you!):

1. If you sell the stock and you’re in a 25% federal income tax bracket you can either give FTR the \$7,750 remaining after taxes, or give the full \$10,000 and pay taxes out of other assets;

2. If you give FTR the stock you can deduct the entire \$10,000 market value for federal income tax purposes and FTR can sell the stock and keep the entire \$10,000 because, as a 501c(3) charitable organization, FTR pays no federal income taxes.

You’re better off giving the stock itself, not the proceeds from sale of the stock, to FTR, and we are more than happy to accept gifts of stocks or bonds at any time.* Thanks for your support.

**Please check with us if you have other appreciated assets—such as real estate—that you wish to gift and we will determine what type of arrangement will work for both of us!*

Land Use

FROM PAGE 1

ments will maintain and regenerate cottonwood stands, provide aquifer re-charge and decrease overall stream power, reducing the need for future channelization measures. Planning for, and protecting the stream corridors will allow for gravel and large woody debris recruitment, and increase stream habitat diversity, which will benefit cutthroat trout.

Intermountain Aquatics used the

Riparian Development guidelines to plan the Redtail Development along Teton Creek around a “working floodplain” that would safely maintain and protect the functional values of the riparian corridor. “What we did not want was a development that met the city and county standards but resulted in the channelization of Teton Creek and the isolation and destruction of its valuable floodplain.” Katie Salisbury, Intermountain Aquatics, Inc. The result is a development plan that

allows flood flows to continue to spread across the flood plain and will therefore maintain and regenerate cottonwood stands, provide aquifer recharge, maintain wetlands and decrease overall stream power, reducing the needs for future aggressive measures.

FTR hopes to continue working with other landowners to implement proactive planning that will protect valuable stream corridors, prevent expensive mitigation efforts, and enhance property values.

New Targhee SNOTEL site provides data from 9,200’

FTR and the Natural Resources Conservation Service (NRCS) partnered with Grand Targhee Resort to install a new SNOTEL (SNOw TELelemetry) station at the ski area. Friends of the Teton River spearheaded the campaign to raise the \$25,000 necessary to pay for the site installation and equipment. Funding was made possible by various supporters including Grand Targhee Resort, the Teton Conservation District (Jackson, WY), the Bureau of Reclamation, the local Trout Unlimited Chapter and Fall River Electric.

This is the first Idaho SNOTEL site to be added to the network since 2002. Out of over 700 sites that dot the Mountain West, there was previously no site providing high elevation snow pack data for the area, let alone data for the western slope of the Tetons. It was this lack of information from high elevations that contributed to spring flooding in 1997, when the amount of snowpack was underestimated. The new station at Grand Targhee will provide more accurate meteorological data and will measure snow water content used for spring stream flow predictions in the upper Teton Basin.

A typical SNOTEL remote site consists of measuring devices and sensors, a shelter house for the radio telemetry equipment, and a solar panel to keep the batteries charged. Sensors at the Targhee site will include a snow pillow, precipitation gage, wind speed and direction, snow depth, soil moisture sensors and air temperature.

One of the key components, a snow pillow, is an envelope of stainless steel or rubber about 4 feet square, containing an antifreeze solution. As snow accumulates on the pillow, it exerts pressure on the solution. This weight of snow is then converted in a reading of the snow’s water equivalent—that is, the actual amount of water in a given volume of snow.

The new Targhee station was built at an elevation of approximate 9,200 feet and near the existing weather station where the snow

measurements have been taken.

All of this data is transmitted by radio signals and reflected off of meteor trails back to one of two master stations in Boise, ID and Ogden, UT. SNOTEL stations in 10 Western states cover almost 1 million square miles and transmit data that is uploaded hourly onto the NRCS website. Sites are designed to operate unattended in severe conditions for up to a year, but manual “ground truth” measurements are taken to check for accuracy of the remote instruments.

Besides creating better stream flow prediction indicators that could be used by farmers, irrigators, hydropower producers and water managers, the site will also have value for skiers in the form of real time snow report data available to the ski area, archiving historic climatic records and winter education classes. This past winter, the Teton Community School third, fourth and fifth grade participated in the Adopt-A-SNOTEL program, learning about the water quality and quantity in the snowpack on Pine Creek Pass. The Targhee site will provide an accessible high elevation site to its mid-elevation companion.

Please visit the site this winter or access the site data, posted on the web at: <http://www.wcc.nrcs.usda.gov/snotel/> and click on the State of Wyoming and the Grand Targhee Snotel site.



Solar panels (above) provide the electricity needed to operate the new Snotel site (below) at Grand Targhee.



BROOKSIDE HOLLOW



The J-Hook vanes are rock structures that extend from the bank to the center of the channel and point up stream. The vanes redirect stream flow away from the bank towards the center of the channel which creates a scour pool on the downstream side of the vane, a valuable fish habitat feature.



A 200-foot eroding stream-bank in Brookside Hollow, prior to restoration.



The final stages of the restoration project at Brookside Hollow. Two J-hook vanes (shown by arrows) just below water level create pools.

Open Channels at work on Trail Creek

In 2006, FTR launched its Open Channels Program, which synthesizes five years of research and data collection, to implement on-the-ground projects for the health of the Teton Watershed. The objectives for Open Channels are to promote an abundant fishery, decrease sedimentation, and establish stable streambanks and healthy riparian habitat. The strategies include: 1) Increased water flow in tributaries; 2) Improved fish passage on tributary streams to the Teton River; and 3) Streambank restoration.

Fish Passage

In August, FTR completed two projects near Victor that will improve fish passage, spawning opportunities, and fry survival on Trail Creek, an important tributary of the Teton River. Both projects, which were completed in cooperation with the Trail Creek Sprinkler Irrigation Company, involved the construction of large rock weirs.

The Town Canal

Just upstream of Victor at the Town Canal irrigation diversion, three stream-spanning rock weirs were built to create a series of low jumps for fish where there had previously been one high jump. This high jump prevented the upstream movement of many fish each year, especially in late summer at low flows. The Town Canal project will benefit all species of fish on Trail Creek including Rainbow, Eastern Brook and Yellowstone Cutthroat Trout.

Trail Creek Fish Ladder

The second project, further upstream adjacent to the National Forest boundary, involved the construction of a rock weir designed to create an entrance pool into an existing fish ladder on the main irrigation diversion on Trail Creek. The lack of an entrance pool was preventing fish from using the ladder to move upstream. The “assist” provided by the fish ladder project is intended to primarily benefit larger native Cutthroat Trout that still run up Trail Creek from the Teton River each spring to spawn.

Brookside Hollow

At the end of September, FTR completed a stream bank restoration project on Trail Creek at the Brookside Hollow subdivision. The project stabilized approximately 200 linear feet of streambank that were eroding up to a half foot of bank a year into Trail Creek and creating vertical cut banks of 4-8 feet. To stabilize the bank, FTR used a combination of rock and vegetative techniques that included constructing a rock terrace and contouring the bank, installing three J-

Hook vanes, and planting vegetation. The project will help to protect a home from erosion and flood events; reduce sedimentation of Trail Creek; and provide fish and wildlife habitat.

Collaborators

FTR worked with numerous collaborators on the design and construction of these projects, including the US Fish and Wildlife Service, Western Watersheds, Idaho Department of Fish and Game and the U.S. Bureau of Reclamation. Project funding came from the US Fish and Wildlife Service, Community Foundation of Jackson Hole, National Fish and Wildlife Foundation; volunteer labor from Grand Targhee and public volunteers. FTR would like to especially thank On the Rocks Aggregate, who provided an invaluable match on rock used in the project and Arlin Grimes of Western Watersheds, who provided technical expertise and track hoe work.



TOWN CANAL



Early stages of construction of the fish passage rock weirs at Town Canal. Boulders were placed and covered with erosion-control fabric.

Final results at Town Canal! An eroding weir is replaced by a series of pools that make fish passage possible throughout the year.