VOL. 5 NO. 3 AUTUMN 2005

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

A Tale of Two Tributaries:
The Juvenile Trout Project comes to a close

BY MARTIN KOENIG

While many folks in Teton Valley were dressing in their ski pants to take advantage of the late winter snow, we pulled up our chest waders and marched out into the chilling gray morning to upper Teton Creek. A combined force of more than eleven technicians, biologists and graduate students from Idaho Department of Fish and Game, the US Forest Service, Friends of the Teton River and Utah State University headed out across the fresh snow to collect the last piece that would finalize the Juvenile Trout Project.

In July of 2003, FTR joined forces with Idaho Department of Fish and Game and Utah State University to address the decline of Yellowstone cutthroat trout in the Teton Valley. The Teton River had large adult cutthroat that were becoming older and fewer, with few new cutthroat entering the system (low recruitment). Past trout research in the Teton Valley has been done on Fox and Teton Creeks, but was confined to very small accessible portions of each stream, preventing an overall assessment from being accomplished. Thus began the

☞*CONTINUED ON PAGE 2*

Lee Mabey of the U.S. Forest Service helped train the tributary assessment crews in May. (See article on page 4.)

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

TWO TRIBS ☞ *From Page 1*

juvenile trout project, which has been an effort to understand why few of these young fish made it to adulthood in the Teton River. Thanks to the generous support of many local landowners such as the Beards, Moultons, Crary's, Mithuns, Huntsmans, the Teton Regional Land Trust and others, as well as the U.S. Congressional Appropriation, we were able to investigate these streams as a whole, giving us a much more complete picture of the issues surrounding juvenile trout recruitment.

After preliminary investigation during the first year of the project, it became clear that efforts to solve this problem would be most productive if focused on Teton and Fox Creeks, the two major spawning and rearing tributaries for cutthroat in the Teton Valley. Understanding these two streams would give us the best ideas of what problems might explain cutthroat declines throughout the Valley.

The Juvenile Trout Project consisted largely of four interconnected components: spawning, habitat, abundance, and whirling disease. From March through July 2003, the spawning assessment included comprehensive weekly surveys of Teton and Fox Creeks to identify where and how many cutthroat were spawning in these tributaries. Next, we systematically inventoried the stream habitat in each tributary to be used to explain local fish abundances, which were assessed during fall 2004 and spring 2005 over the length of each stream. In addition, we also sampled for whirling disease infection in fall 2003, and early summer of 2004 throughout the mainstem Teton River and in Fox and Teton Creeks. Following are the major results from these components and their implications on the future of cutthroat in the Teton Valley.

SPAWNER SURVEYS

Spawning surveys (or redd counts) produced three major findings. First, most of the cutthroat (and rainbow trout for that matter) spawned largely in upper portions of Fox and Teton Creeks. This pattern is especially pronounced in Fox Creek, where most fish spawned exclusively in the upper 1 km of stream, near the 600 South road crossing. This pattern was also similar for Teton Creek, where most cutthroat spawned just downstream from Highway 33 and in a small spring tributary called Six Springs Creek. Since these fish are migratory adults from the mainstem Teton River, it suggests that given the opportunity, these fish would migrate farther up each stream if habitat were available. However, fish run out of water just above the current spawning beds, preventing them from reaching their historic spawning habitats.

The second finding was that the total number of spawning cutthroat trout was very low. Considering the low population numbers reported in the Teton River, this was not surprising. In Fox Creek, we counted only 33 definite cutthroat redds (spawning sites). We documented 20 cutthroat redds in Teton Creek, with an additional 17 redds in Six Springs Creek. Another interesting discovery was that the number of rainbow trout spawning in Fox Creek outnumbered that of cutthroat trout. However, in Teton Creek, only four rainbow trout redds were discovered, leaving cutthroat as the spring-spawning majority.

Using the total number of spawning cutthroat found in each tributary, and the average size of mature cutthroat from the Teton River, we calculated the total number of cutthroat eggs likely laid in each stream. We then compared this to the estimated number of cutthroat fry from the fall electrofishing surveys, producing a general estimate of egg-to-fry survival. The egg-to-fry survival rates were good in both creeks, estimated at 20% and 25% for Fox and Teton Creeks, respectively. Knowing that a good portion of the eggs laid into the streambed actually result in cutthroat fry indicates that spawning gravel quality in each stream is suitable to support spawning. In trying to solve the recruitment puzzle, we can eliminate poor spawning gravel quality as a likely cause, yet the length of stream may limit the total amount of available spawning habitat with water in it.

☞ ***CONTINUED ON PAGE 6***

LEFT: FTR members Tim and Erin Burnham, Mayo and Susan Lykes and John MacIntosh enjoy an evening by the Teton River. BELOW LEFT: Lynn Sandman takes a break from selling t-shirts. BELOW CENTER: FTR Staff Lyn Benjamin and Anna Linstedt (aka Vanna White) display trout bench made by Mark Harrington. BELOW RIGHT: FTR board member Andy Steele (inset) and Sandy Mason help auctioneer Ken Chambers.

FTR celebrates five years with the Community

Friends of the Teton River sincerely appreciates all the individuals who attended the Fifth Annual River Party. Two hundred and fifty people enjoyed a beautiful evening by the Teton River and helped to fundraise over $20,000 in income. Thank you to the following businesses and volunteers for their generous donations of auction items and time. The event would never have been as successful without their generous support.

Phyllis Anderson
Apparels of Pauline
Missy Barnes
Barrels & Bins
Dan Burr
Lyn Benjamin
Noel Benjamin
Big Hole Music
Broulim's
Cannon Wines
Rich Carlson
Ken Chambers
Cosmic Apple Gardens
Ryan Colyer
Damon Cotter
Custom Fishing Nets
Dark Horse Books
Elisa Davis
Dining In Catering
Siobhan Dodge
Exum Mountain Guides
Tom Fenger
Grand Targhee Resort
Grand Teton Brewing
Grand Teton Dental
Gourmet Pantry
Habitat
Mark Harrington
Heron Glass
High Peaks Health & Fitness, Inc.
Mr. & Mrs. Jon Huntsman
Hyde Boats
Images West
Jack Dennis Sports
Jackson Hole Mountain Resort
Jackson Hole Nordic Center
Bill Kelly
Kodiak Girl
Phil Lansing
Mike Lawson
Leave it to Me Catering
Magpie
Dale Minson
Miso Hungry
Michael Morey
O.A.R.S.
Patagonia
Pendl's Bakery & Café
Pike & Smith Law Office
Rendezvous Backcountry Tours
John Rice
River Time Designs
Charlie & Bo Ross
Royal Wolf
Lynn Sandmann
Sands Wild Water
Karen & Dean Scheid
Simms Fishing Products
John & Nancy Siverd
Smith's
South Fork Outfitters
South Fork Skiff
Spectrum Gems, Inc.
Andy Steele
Don & Jane Streubel
LeAnn & Tom Talbot
Teton Aviation
Teton Science School
Teton Therapeutic Massage
The Hole Hiking Experience
Babette Thorpe
Three Rivers Ranch
Tye Tilt
Topper Custom Cue
Sue Tyler
Rob Van Kirk
Victor Valley Grocery
Warbirds
Tim & Margot Watters
Westbank Anglers
Tom Westlund
Will
Woman Tours
World Cast Anglers
David & Suzy Work

Counting fish

Crews are sampling 12 Teton River tributaries to determine distribution & density of Yellowstone cutthroat trout in a joint U.S. Forest Service/FTR project

It has been very busy at the FTR office this summer, especially at 7 am when the tributary assessment crews leave for a day of bushwhacking into their sampling locations. The crews are headed by Mike Lien, Ryan Colyer and BYU graduate student Jordan Neilson. Local crew members include Phillip Edmunds, Leslie Prendegast, Anna Lindstedt and FTR high school scholarship recipients Leanna Knight and Ben Davis with assistance from Idaho Department of Fish and Game, Wyoming Game and Fish, U.S. Forest Service and local volunteers.

The crews have been conducting a population assessment of trout and non-game species in a dozen tributaries to the Teton River, with focus of determining the distribution and density of Yellowstone cutthroat trout. Five percent of each tributary length is sampled. This is accomplished by electrofishing a one hundred meter stretch of creek every two kilometers, from the Forest Service boundary up to the headwaters of the system. Fish are stunned, captured with a dip net, and then identified, measured, and released unharmed. The habitat characteristics of the hundred meter reach are then recorded including number of pools, depths, cross sections, bank stability, and the number of woody habitat structures.

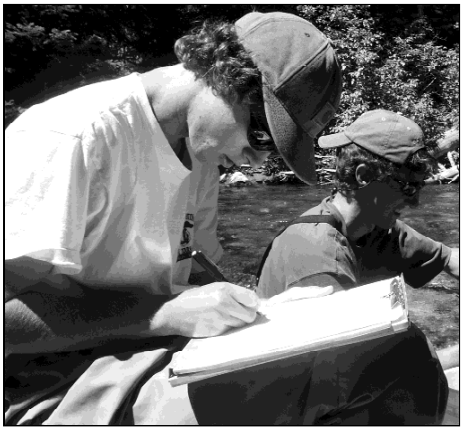
The crews have completed sampling in S. Leigh, N. Leigh, S. Badger, Trail, Little Pine, Mahogany, Horseshoe, and Packsaddle, and are currently working on Teton and Darby Creeks. Moose and Bitch Creeks are slated for the end of summer. They have completed two week-long camp outs in the Jedediah Smith Wilderness, made possible by the generously donated horse packing services of local Hans Wilbrecht.

Ryan Colyer displays a picture perfect example of a Yellowstone cutthroat trout.

Many thanks to the following funding sources for making the project possible: Community Foundation of Jackson Hole, Federation of Fly Fishers, Henry's Fork Watershed Council, National Forest Foundation, One Fly Foundation, Snake River cutthroats, Targhee Environmental Foundation, Trout Unlimited, National Fish & Wildlife Foundation and the One Fly Foundation.

FINDINGS

While the numbers haven't been officially "crunched," the crews report that: • Badger and South Leigh Creeks are inhabited exclusively by Yellowstone Cutthroat Trout (YCT). • North Leigh was found to contain 90% brook trout and 10% YCT. • A population of YCT in Mahogany Creek appears to be separated, at current flow levels, from the brook trout populations residing further downstream in the system. • Trail Creek contains a mixture of brook trout and YCT.



Teton High School junior Ben Davis records YCT lengths on a data sheet.

THS student Leanna Knight taking a break from hiking with a heavy pack in the FTR office.

Hans Wilbrecht volunteered his time to pack the crew's gear into Bitch Creek and Badger Creek for a four day survey.

Paddling at the headwaters of the Columbia River.

From the Headwaters to the Coast

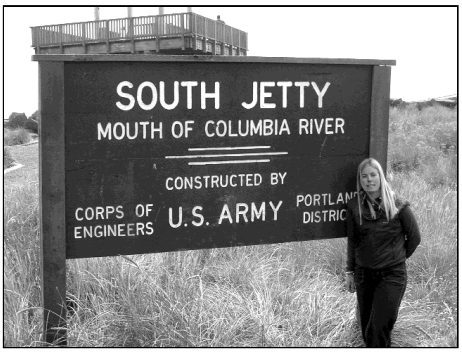
Two hundred years after Captains Meriwether Lewis and William Clark, the 31 members of the "Corps of Discovery" and Lewis' Newfoundland dog (34 souls in all) journeyed down the Columbia River; 34 educators from British Columbia, Washington, Oregon and Idaho followed a similar route from the headwaters to the coast.

In a first of its kind environmental education tour sponsored by the Environmental Protection Agency, FTR Education Director Anna Lindstedt joined her peers from around the Columbia River Basin to learn about present and historical water uses, current issues and management strategies.

Site visits and seminars allowed the educators to experience the diverse importance of Columbia River water to communities across the Basin. Participants had the opportunity to tour many facilities including the Grand Coulee and Bonneville Dams, the Kootenai Tribal Fish Hatchery, a native plant nursery, the Hanford Nuclear Facility, Fort Clatsop and the Port of Portland. They also heard various perspectives on water use from Ktunaxa and Tamastslikt tribal members, the Army Corps of Engineers, National Park Service, Environmental Protection Agency, fisheries biologists, farmers, and migrant workers.

The tour adopted a "watershed" approach, networking participants from drainages across the entire Columbia River Basin. "A lot of the time, we tend to think in terms of political or regional boundaries. We forget that we are part of larger watershed community that extends from our neighbors directly downstream, to Canada and the ocean," Anna reflected, "The tour gave me the perspective that water education and conservation doesn't end with the Teton River, it only starts here."

As a take home project, Anna will educate Teton Valley students about the geography and issues facing the greater Columbia Basin and how they can contribute to the health of their own watershed. As part of this, she has set-up a pen-pal program with classes in Vancouver, Washington and British Columbia so kids can learn about the importance of water from students in other parts of the Basin. Anna will make a public presentation about the Columbia "Headwaters to the Coast" tour in a public education forum this September.



Anna Lindstedt at the end of the journey.

In Memory of

Henry Grant Theis

BY TOM FENGER

Grant Theis, a beloved fellow fisherman, applied uncommon passion, finesse, diligence, and enthusiasm to life and his fishing. He was a masterful fly tier who always arrived with a boxful of new creations ready to introduce to the crafty trout of the upper Teton River.

A day with Grant was fun and challenging. He would ask me to see the fly that I had been working and then grumble and pull one out of his own box. After catching a few fish he would turn to me, smile and ask if I would like to see the fly. Over the years we both humbled ourselves to each other and the process was always full of laughs. Grant's wife Jacquette reeled in the rewards of our efforts. Many of Grant's fly patterns and memories will be around for years to come.

We will miss Grant and his wonderful friendship and extend our deepest sympathies to his wife and family. Thank you to the following individuals for making a generous donation in honor of Grant, a good friend, wonderful fisherman and long time supporter of Friends of the Teton River.

Mrs. Elizabeth B. Ames
Nancy Armistead
Mrs. Lazare F. Bernhard & Family
Susan E. Bonesteel
Jan & Bill Clayton
Mr. & Mrs. Larry Cooper
William C. Davidson
Mr. & Mrs. Julian Ganz, Jr.
John & Margery Gilchrist
Barbara Goldenberg
Carolyn & Donald Haber & Family
Cissy Hadley
Mary Alice Jennings
Steve & Sally Keller
Nancy & Jim Kilroy
Maryon P. Lears
Mrs. Anthony Liebig
Christine Lotery
Ann S. Lucas
Dr. & Mrs. Clark McQuay
Sherman & June Mellinkoff
Judy Pickett Nunnelly
Drs. Paul & Jacqueline Royce
Charles M. Ruprecht
Artice Silverman
Mrs. T. Burton Smith
Mrs. R.O. Stewart
Mr. & Mrs. J.W. Whitaker

TWO TRIBUTARIES ☞ *From Page 2*

HABITAT & ABUNDANCE SURVEYS

For the habitat portion of the study, we wanted to identify particular habitat attributes that were highly correlated with fish abundance, such as bank stability, gravel size, width, or the distance to the nearest spawning site. Habitat attributes that are highly correlated to local fish abundance may limit the total number of fish. From our electrofishing data, we knew that cutthroat fry were patchily distributed in each creek. To identify the habitat variables controlling the variation in cutthroat fry abundance, we combined our electrofishing data with the habitat data using statistical techniques. The analysis showed that the variation in cutthroat fry abundance is best explained by spawning-related variables. In Fox Creek, variation in cutthroat fry was positively correlated to distance upstream from the mouth combined with percent riffle habitat within the sampling reach. This made biological sense, as young trout fry do not disperse far from where they were born, and most of the spawning in Fox Creek happened further upstream in riffles.

Results from the Teton Creek analysis tell a similar story. Local cutthroat fry abundance almost entirely explained by the number of redds within 200m of the sampling location, the number of young brook trout present, and to a small degree, the percent of stable bank. Since young trout fry don't move far from their place of birth, the fact that cutthroat fry numbers were correlated with proximity to redds and the number of young brook trout makes sense. (Brook trout presumably spawned in similar locations, only earlier in the year). Additionally, trout fry seek shelter along the margins of the stream to hide in cover like grasses and willows. These grasses and willows that comprise suitable margin habitat often are associated with stable banks.

We collected trout abundance data in fall 2004 and again in spring 2005, giving us the ability to calculate apparent survival through the winter. Based on studies in other areas, survival for young trout fry through their first winter is commonly poor – as low as 1-5% in most cases. Rates of cutthroat fry survival in Fox Creek and Teton Creek for their first winter was relatively good at 4% and 13%, respectively. For older age classes of cutthroat, overwinter survival was much lower than expected. In Fox Creek, only 5% of age-1 cutthroat survived the winter, while only 35% survived the winter in Teton Creek. High rates of mortality are expected for age-0 fish, but increased rates of mortality at older age classes can result in population level declines.

Unfortunately for cutthroat trout, brook trout and

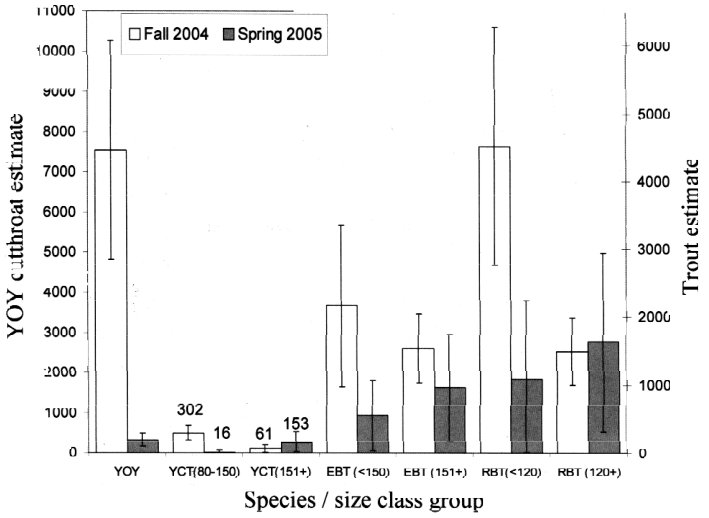


Figure 1. Stream-wide abundance estimates by season for Fox Creek. Estimates are shown for all trout species / size class groups with associated 95% confidence intervals.

rainbow trout are not experiencing the same high rates of mortality at age-1 and age-2. Brook trout and rainbow trout did extremely well over the same period of time where cutthroat declined heavily. Brook trout fry and rainbow trout fry in Fox Creek survived at 25% and 24%, respectively (when cutthroat survived at 4%). Teton Creek showed a similar trend where brook trout fry survived at 59% compared to cutthroat fry at 13%. So the currently available stream habitat appears suitable, yet most of the production potential of each stream is going into producing brook trout and rainbow trout.

To summarize the habitat and abundance surveys:

• Fox Creek and Teton Creek are supporting good numbers of non-native trout,

• These trout are surviving better than native cutthroat, and

• Rates of cutthroat survival are better in Teton Creek (where rainbow are still at very low levels). Previous research throughout the west has shown that cutthroat trout compete poorly with non-native brook trout and rainbow trout, and that brook trout can often completely replace populations of cutthroat. The poor rates of cutthroat overwinter survival coupled with excellent survival rates of brook and rainbow trout suggest that competition for overwinter habitat at the age-1 life stage may be limiting cutthroat recruitment to the Teton River, and hence the total cutthroat population.

WHIRLING DISEASE

Impacts from whirling disease can be highly variable between and within systems. For example, whirling disease is severe enough in portions of the Colorado, Gunnison, Rio Grande and South Platte rivers to eliminate almost the entire cohort of wild rainbow trout fry every year. In contrast, the Big Thomson River near Estes

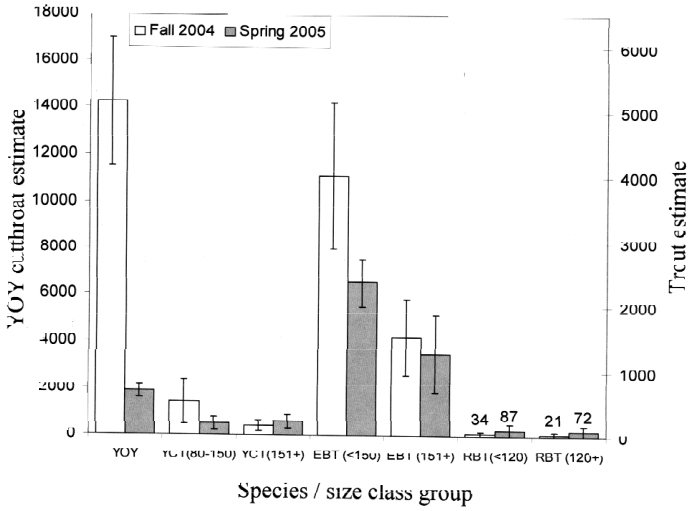


Figure 2. Stream-wide abundance estimates by season for Teton Creek. Estimates are shown for all trout species / size class groups with associated 95% confidence intervals.

Park tested positive for M. cerebralis in 1994, yet recruitment of rainbow trout is excellent. Results from our whirling disease investigation indicate the parasite is widespread throughout the Teton Valley, and some locations are highly infected. Tributary sites like Fox Creek and Teton Creek are more highly infected than mainstem Teton River sites, with infection generally increasing downstream. However, the intensity of the infection varies between locations and seasons. Whirling disease affects only age-0 trout, and rainbow trout are commonly considered to be highly susceptible and more susceptible than cutthroat trout. If whirling disease were the predominant cause of cutthroat trout declines, we would expect to see equal if not greater declines in rainbow trout. In the context of habitat alteration and invasive species, it is difficult to clearly identify what impact the disease is having on the Valley's cutthroat trout.

SUMMARY

Our habitat analyses work showed the variation in cutthroat abundance in both streams was largely a function of number and location of adult spawning cutthroat, and not so much the amount or quality of the habitat currently available. In the context of the greater picture of Yellowstone cutthroat trout restoration for Teton Valley, improving the currently available habitat in these tributaries is not likely to result in more cutthroat trout. In fact, these efforts may result in stronger populations of brook and rainbow trout. Without increasing stream habitat available to cutthroat and addressing fundamental changes to these tributaries, cutthroat trout are not likely to recover to their historical abundance in the Teton Valley. Cutthroat recovery depends less on treating the symptoms of the habitat problem, and more on addressing the factors that limit the tributary habitat that favors cutthroat trout. Most importantly, water diversion modifies the hydrologic regime and changes stream habitat conditions to favor invasive trout. Although easy to identify, addressing this problem is difficult. However, if local landowners continue to lend their support and become active participants in restoration efforts, wild Yellowstone cutthroat may still have a future in the Teton Valley.

Thank you to the following members, donors and foundations for their generous contributions during June & July 2005.

Eric Achee
Deb Adams
Travis, Megan & Sam Allen
David Anderson
Clayton Andrews
Dick & Sunny Ariessohn
Gary Arnold
Bryce & Amanda Avalone
Justin Ayer
Steve Baldwin
Rod Barnes
Betsy Barnett
Richard & Bev Berg
Joel & Kim Berger
Martha & Tim Black
Chad Bogart
Ellen & Gerald Bogart
David & Alene Breckenridge
Ann-Toy & Porter Broughton
Chris Bryan
Tim & Erin Burnham
Scott, Mary, Jackson & Ellie Burton
Jen & Joe Calder
Len Carlman
Jeff Carter
Cal, Myra & Tim Cathcart
Eleanor Catlow
City of Driggs
Hal Cochrane
Janet Conway Heslin
Jacki & Casey Cooke
Joe Costello
Tera Crisalida
Sandy & Dick Cummings
Laurel Dana
Elisa & Tom Davis
Skip Dempesy
Marge & Stan Edwards
Francine Farrell
Judy & Thomas Fauntleroy
Dawn & Mitch Felchle
J. Christian Fenger
Charlie Gaudet
Greg Geffner
George Geiges
Matt Germino
Margaret & Ryan Gillentine
Geodie & Kim Gillett
Kim Goodman
Virginia & Clint Grosse
Eric Helgoth
Buol Heslin
Dan & Virgina Hoke
Margot & Alan Hunt
David Huntsman
Idaho Dept. of Environmental Quality
Brain Jacobson
David James
Larry Johnson
Jorgensen Associates
Dave Joslyn
Willy Keating
Ted Kerasote
Kathy Kilgallon
Jeff & Darcy Klausmann
Chris Koenig
Kisa Krueger
Anne Ladd
Kevin & Zane Lance
Alex Lheritier
Susan & Mayo Lykes
Amber Mackey
Art Markert
Kathie Martin
Sandy & Mary Mason
John Matson
Dave Max
Richard & Patsy Mayer
Nancy & Mike McCoy
Dick & Kay McIlroy
Pauline & John McIntosh
Ken & Barbara McIntosh
Alice & Alan McIntosh
Alan McKnight
Linda & Mike Merigiliano
Mike & Margaret Merigliano
Matt Miller
Chris Moore
Barbara & Mike Morey
Sharee Morris
Emily Morrison
Vickie Nelson
Todd Nichols
Bill Nicholson
Steve & Sue O'Connor
Cara Olaveson
Gary Olerud
Andy & Betsy Olerud
Max Ora
Beverly Palm
Joe & D.A. Palmer
John & Christine Parker
Robert Parkins
Trey Peacock
Peter & Anne Peterson
Chuck & Twing Pitman
Sam & Joyce Pole
Dana Richardson
Kathleen Rodriguez
Ried & Jeanne Rogers
Charlies M. Ruprecht
Frances Russo
Leslie Ryan
Karen & Dean Scheid
JoAnn Scoggin
Sharon & Martin Scott
Carolyn Sears
YT Sempert
Larry S. Slotta
Patti Snarr
Amy Snell
Sotheby's International Realty
Jennifer Stadum
Andy, Sabra & Robert Steele
Alice & Robert Stevenson
Kathy & Jerry Stillman
Don & Jane Streubel
Dan & Melissa Streubel
Hope Strong
John Sundheim
Steve & Diane Temple
Teton Regional Land Trust
Mark Thompson
Jeri Thomson
Tye Tilt
Frank Trotter
Marie & Bob Tyler
Marni & Brad Vasseur
Dee Dee Wagner
Jo Warden
George Wendt
Kate West
Betsy & Gene White
Dan & Pat Willert
Becky & Gene Williams
Charlie Woodward
Leigh & Chet Work
David & Susan Work
Casimir & Carol Yost
Joyce & Felix Zajac

Thank You!

CORRECTION: The spring 2005 newsletter stated that Ms. Gayle Valentine made a contribution to FTR. The donation was from the Idaho Fish and Wildlife Foundation and not from Ms. Gayle Valentine. FTR sincerely apologizes for this error and appreciates being notified of the mistake.

Protect Teton Valley's precious water resources

Donate to Old Bill's Fun Run

Help protect one of Teton Valley's most valuable assets–the Teton River and its associated watershed. If you make a donation to Friends of the Teton River through Old Bill's Fun Run by Sept. 16, your contribution will be matched by approximately 48 percent. An Old Bill's Fun Run contribution will fund a variety of programs including scientific research, on-the-ground restoration and public education efforts. Since this fundraiser provides FTR with a majority of its operational funds and 20% of our entire budget, your donation is of vital importance. Official Old Bill's donor forms are available at local merchants, the FTR office (36 East Little Avenue in Driggs) or by request at 208-354-3871. Please make your contributions to the Community Foundation of Jackson Hole and designate the amount you would like to go to Friends of the Teton River today. Your contribution will help protect the Teton River, improve its fisheries, and keep its beauty for future generations.

Friends of the Teton River
P.O. Box 768 • Driggs, ID 83422
ADDRESS SERVICE REQUESTED

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

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