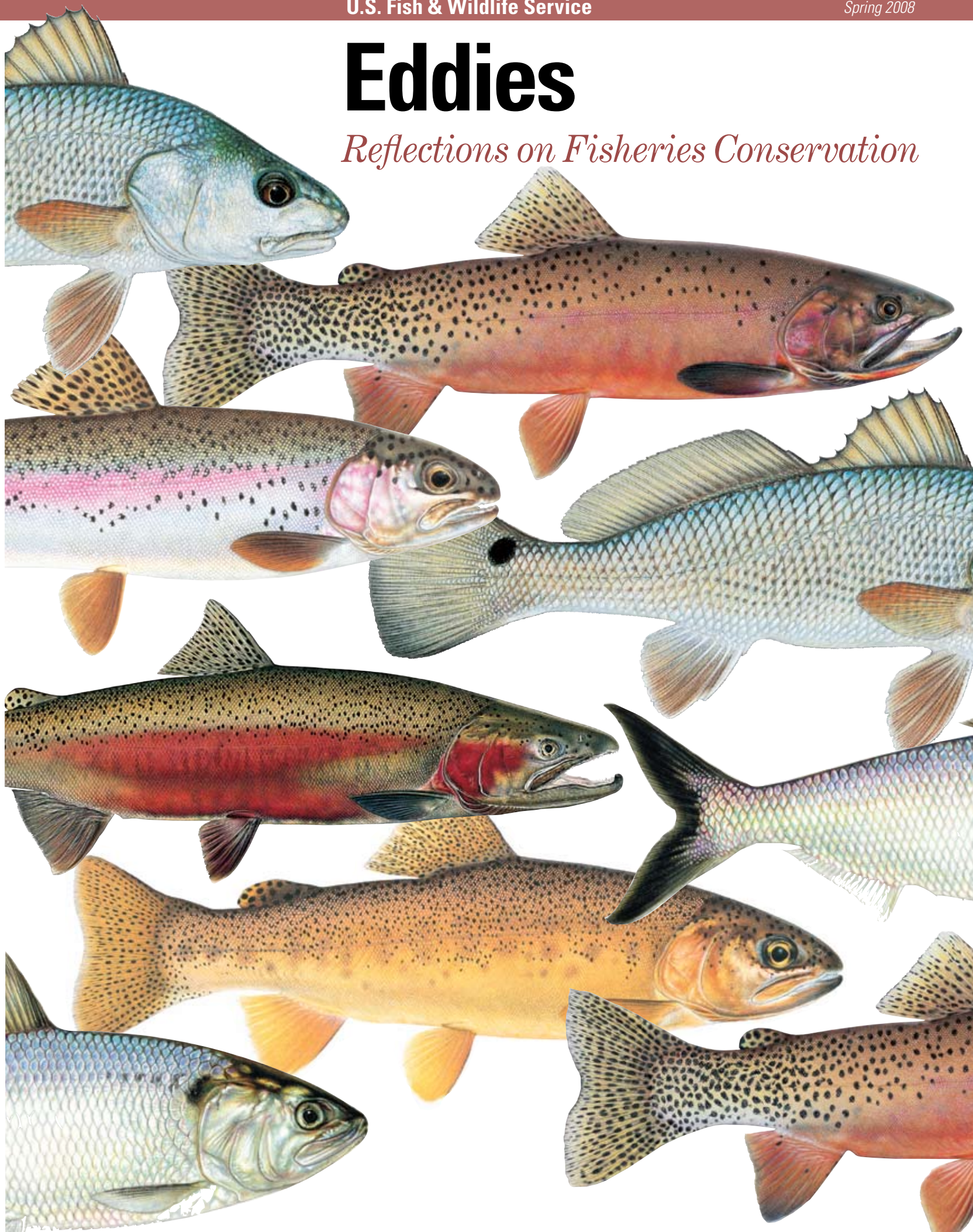


Eddies

Reflections on Fisheries Conservation



Eddies

Vol. 1, No. 1

Publisher

Gary Frazer, Assistant Director
US Fish & Wildlife Service
Fisheries and Habitat Conservation

Editor

Craig Springer

Contributing writers

Lee Allen	Mark Madison
Steve Brimm	Jim Martin
John Bryan	Mark Maskill
James Caudill	Matthew Patterson
Wade Fredenberg	Frank Peterson
Stuart Leon	Henry Quinlan
Rachel Levin	Gordon Robertson

Editorial Advisors

Darren Benjamin, U.S. Fish & Wildlife Service
Richard Christian, U.S. Fish & Wildlife Service
Stuart Leon, Ph.D., U.S. Fish & Wildlife Service
Ryck Lydecker, Boat Owners Association of the United States
Hal Schramm, Ph.D., U.S. Geological Survey
Michael Smith, U.S. Fish & Wildlife Service (retired)
Denise Wagner, Wonders of Wildlife Museum

Assistant Regional Directors – Fisheries

Dan Castleberry, California and Nevada Region
Dan Diggs, Pacific Region
Jaime Geiger, Ph.D., Northeast Region
Gerry Jackson, Great Lakes–Big Rivers Region
Linda Kelsey, Southeast Region
Greg Pratschner, Southwest Region
LaVerne Smith, Alaska Region
Mike Stempel, Mountain-Prairie Region

Contact

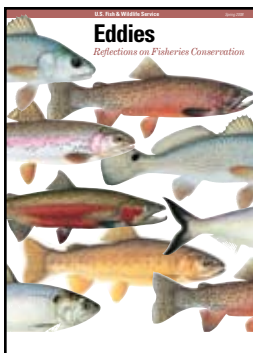
For subscription information, please email
craig_springer@fws.gov or call 505 248-6867
or write to:
Eddies
USFWS Fisheries Rm 3118
500 Gold Ave SW
Albuquerque, NM 87103

Design

Blue Heron Communications

On the Cover

Red drum, westslope cutthroat trout, rainbow trout,
steelhead, Gila trout, American shad. Joe Tomelleri, artist.
Americanfishes.com.



Departments

Headwaters 3
Watermarks 4
Pioneers 8

American Fishes 10
Meanders 30

Features



A Tradition Tied to Economics–12

Frank Peterson
Gordon Robertson
James Caudill



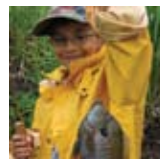
Fish Came First–20

Steve Brimm



Two Medicine Trout–16

Mark Maskill



Walkin' In Jerusalem–24

John Bryan



Uncle Art's Trout–18

Wade Fredenberg



Fish in the Forest–28

Lee Allen



The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect and enhance fish, wildlife, plants and their habitats for the continuing benefit of the American people.



Headwaters

Rivers as Meridians

By Gary Frazer



Southeast Iowa's Skunk River is my prime meridian. It is that singular line, hardly straight by any means, from where I have taken all measurements in forays from youth. Our formative youthful years shape the way we view the world all the rest of our lives, and I spent mine in the small farming community of Brighton, near the banks of the Skunk River.

There was nothing glamorous about the Skunk, pouring by slow and sluggish. Its name even evokes a vignette of an unfortunate encounter. But the Skunk was our river. We fished it, we floated it, we swam it, we camped on its sandbars. My dad and I spent night after night on its banks fishing for channel catfish, and quietly cursed the biting mosquitoes and the stonerollers that stole our bait. Fishing the Skunk was a portal to coming to know nature.

Recreational fishing has incalculable aesthetic and intrinsic values – it “proves to be like virtue, a reward to itself,” as the apostle Izaak Walton mused. Five hundred years of fishing literature reveal that people have long sought the counsel of waters. Fishing clears out the detritus that fills our lives; simply put, it is important for emotional well-being. It has other values as well, where the metrics are easily understood and easily gauged. Livelihoods center on the economic value of fishing.

Inside this inaugural issue of *Eddies* you will read about the confluences of conservation and fishing and people in our standing columns – Watermarks,

Pioneers, American Fishes, and Meanders – and in the feature stories.

Gordon Robertson with the American Sportfishing Association writes a feature about the sinews of conservation and commerce, while economist James Caudill shows that fish for the creel is also coin in the coffer. Frank Peterson, CEO of the Recreational Boating & Fishing Foundation, punctuates both points in his story about pledging to take more new people fishing via AnglersLegacy.org.

Fishing anchors people to place. Wade Fredenberg writes about his multi-generation Montana family and their reverence for bull trout. Craig Springer homes in on his natal upland creek in Ohio. Veteran fish biologist Steve Brimm takes us from the origins of American fisheries conservation in the early 1870s, through his career experiences, and inspires us for the future.

Perhaps the greatest gift to the future is to do our very best right now. And that's what *Eddies* is about, communicating to those we work with alongside and to those we serve. I am honored to serve as Assistant Director to see *Eddies* come to fruition. It is the fruit of staff dedicated to communication and its contents convey the firm commitment to fisheries conservation shared by employees throughout the Fish and Wildlife Service.

I hope you share my personal enjoyment and professional dedication to fishing. Treat every fishing trip like it was your last. And don't go alone. Pledge to take someone new. Listen to what conservationist Gifford Pinchot wrote 70 years ago in his book *Fishing Talk*: “Wherever you go, and whenever you can, take the youngster along.” Whether young or old, and the water flat or flowing, you can help someone find their prime meridian.

Gary Frazer is the Assistant Director for Fisheries and Habitat Conservation in Washington, D.C.



Karla Bartlett/USFWS

The National Fish Hatchery System's M/V Spencer F. Baird hauls lake trout to target sites in lakes Huron and Michigan.

Where the Baird's been

The U.S. Fish and Wildlife Service's M/V Spencer F. Baird is a one-of-a-kind vessel making waves in lake trout restoration on the Great Lakes. Christened in September 2006, the Baird stocked a record-number 4.4 million lake trout from the National Fish Hatchery System by June 2007 in lakes

Huron and Michigan. Biologists from the Alpena Fish and Wildlife Conservation Office assessed lakers from gill nets fished from the Baird in Lake Huron. The data will direct future stockings, which continue in spring 2008. The Baird is named for the first commissioner of the U.S. Fish Commission, created in 1871. ♦

Smaller trout, bigger bang

Research by the U.S. Fish and Wildlife Service's Green Bay Fish and Wildlife Conservation Office in WI reveals that yearling lake trout stocked at a larger size don't necessarily fare better in the wild than those stocked at a smaller size. Conventional wisdom has it that bigger fish are better suited to survive the perils of disease and predation, and thus contribute more to a population. But lead researcher Charles Bronte says that's not so for yearling lakers in Lake Michigan. Bronte, and other biologists from the Wisconsin Department of Natural Resources, Jordan River National Fish Hatchery, and the Green Bay Fish and Wildlife Conservation Office, followed the progress of two different-sized lake trout in Lake Michigan from four

years of stocking. Each size was uniquely marked to be identified at recapture.

The fish were spawned at Saratoga National Fish Hatchery in WY, and grown for 15 months at Jordan River National Fish Hatchery in MI. Given several years to grow in the wild, Bronte and the others sought out the marked fish in gill-net surveys near the stocking sites. Their study, published in the *Journal of Great Lakes Research*, showed that smaller fish survived just as well as the larger fish, and thus it pays to release more small fish into the population. The study will help direct the use of limited hatchery space in restoring these denizens of the deep that have suffered from non-native fishes like alewife and sea lamprey. ♦

Recruiting red drum

It is among the most popular of fishes to catch near-shore, the red drum. Its numbers have turned down in South Carolina, and Bears Bluff National Fish Hatchery along with the South Carolina Department of Natural Resources - Marine Resources Division have planted and monitored young red drum in the North Edisto River and its tributaries now for five years. A half-million fingerlings go out in autumn, and a year later biologists from Bears Bluff, with the help of dedicated anglers, recapture them as one-year-olds, usually bigger than a foot long. Without killing them, they collect fin tissues for genetic testing.

The investment in young fish pays dividends. Genetic testing on fish caught in 2006 revealed that the hatchery fish stocked a year earlier made up about forty percent of the population of fish that size in the wild. The South Carolina DNR confirms that older hatchery fish mingle in spawning congregations, without evidence yet that hatchery fish reproduce. This work is fostered by the Atlantic States Marine Fisheries Commission's Interstate Fishery Management Plan for Red Drum. ♦



Scientists and anglers have united to learn more about red drum in South Carolina.

New Rx for trout and salmon

The U.S. Fish and Wildlife Service's Aquatic Animal Drug Approval Partnership Program (AADAP) in Bozeman, MT, has achieved another first. The U.S. Food and Drug Administration recently approved the antibiotic AQUAFLO[®] to control mortality from bacterial coldwater disease (CWD) in all freshwater-reared trout and salmon. Working with Schering-Plough Animal Health Corporation, AADAP fish biologists demonstrated the effectiveness of AQUAFLO[®] in controlling CWD in a variety of fishes. AQUAFLO[®] is the first new oral antibiotic licensed for U.S. aquaculture in more than two decades and will be an important management tool for fisheries programs around the country. "The approval is a giant step forward for conservation," said AADAP director, Dr. Dave Erdahl. ♦

Net returns on Atlantic sturgeon

Biologists from the Northeast Fishery Center in Lamar, PA, invested a great many weeks learning more about how Atlantic sturgeon make a living in New York's Hudson River estuary. This sturgeon historically ranged the coast from Labrador to the St. Johns River in Florida. Its numbers ebb. In the Hudson, it's there you'll find the largest population, and it is well-studied. Even more is known now through the research findings led by Dr. John Sweka, published in the *North American Journal of Fisheries Management*.

For two months in the spring and two in the fall of each year, from 2003 to 2005, Sweka and colleagues set nets in the various habitat types in the estuary seeking to find the most effective way to catch young Atlantic sturgeon. It's the populations of



USFWS

Researcher John Sweka hefts a Hudson Bay Atlantic sturgeon.

the young fish that provide the greatest insight into how the overall populations fare over time. The research revealed the specific habitats the young fish occupy and when best to catch them. The New York Department of Environmental Conservation, which funded the research via its Hudson River Estuary Program, heads into its third year of monitoring the Hudson River fish, expanding on what Sweka has learned. ♦

FEATURED FACILITY Harrison Lake National Fish Hatchery

Where: Charles City, Virginia

When: Established 1930

Then:

Harrison Lake National Fish Hatchery is named after the nearby waters that feed its earthen ponds. This Depression-era federal facility was built for the former farm pond program when the U.S. Fish and Wildlife Service and the former Soil Conservation Service promoted farm ponds for soil and water conservation, and fishery management for food and recreation with rural landowners.

Now:

The hatchery is part of the Virginia Fisheries and Aquatic Resource Complex, restoring



Michael Odum/USFWS

depleted stocks of American shad, river herring, striped bass and freshwater mussels in Maryland and Virginia in the Chesapeake Bay, Albemarle Sound, and the Ohio River and Atlantic slope watersheds. On the web: www.fws.gov/northeast/fisheries/



Biologists electrofish Apache trout from the East Fork White River, Arizona.

Sherri White /USFWS

Cold-storage Apache trout

Keeping a robust broodstock of the federally threatened Apache trout requires taking off some boot tread. Biologists from Arizona Fish and Wildlife Conservation Office, the White Mountain Apache Tribe, and Alchey-Williams Creek National Fish Hatchery took to the high country in 2007. From the East Fork White River on the Fort Apache Indian Reservation, biologists caught wild Apache trout and collected milt for long-term cold storage in liquid nitrogen. Per a science-based brood stock plan, this frozen fish sperm will fertilize eggs in 2008 at the hatchery, ensuring genetic variability. This lemony-yellow game fish is native only to the White Mountains of Arizona. ♦



In good hands. A male Apache trout from the East Fork White River, Arizona.

Sherri White /USFWS

Milestones marked

Genoa National Fish Hatchery in Wisconsin reached a milestone in August 2007, when it turned 75 years old. But that's hardly the sunset years: the age of facilities in the National Fish Hatchery System average about 63 years old. That makes Norfolk National Fish Hatchery in Arkansas a youngster; it celebrated its 50th anniversary at the same time. *Fêtes* held by their Friends groups at both hatcheries were well attended. Genoa raises coaster brook trout, lake sturgeon, and endangered mussels while Norfolk annually stocks 1.9 million rainbow, brown and cutthroat trout for sport fishing in Arkansas and Oklahoma. ♦

Counting coasters

Biologists from the Ashland Fish and Wildlife Conservation Office, WI, caught mature one-pound coaster brook trout in fall 2007 in a small tributary to Whittlesey Creek. The fish were there to spawn, and that provides an ounce of optimism. Their size and beauty and flavor all lend to their legend, these big fish that linger on Lake Superior's coast. "Coasters" are a migratory lake-dwelling form of brook trout once common along Superior's shoreline and tributaries.

The world-record brook trout caught in 1915, a 14.5-pound 34.5-inch behemoth was a coaster. During the last 150 years over-fishing,

habitat loss, and non-native trout and salmon have eliminated coasters from more than 95 percent of their historic range. Iron River and Genoa National Fish Hatcheries rear young coasters collected from Michigan's Isle Royale National Park to re-establish populations in Lake Superior. Research with the Wisconsin Department of Natural Resources in Whittlesey Creek on two strains of coasters and their multiple life stages may guide future work to return coasters to historic locations throughout Lake Superior. ♦

Cop a habitattitude

An innovative formula used by U.S. Fish and Wildlife Service simplifies the complex issues of aquatic invasive species and pharmaceuticals in the environment. These trademarked branded issues empower people to become part of the solution no matter where they live. You'll find these three brands anywhere from boat ramps and pet shops, to your local pharmacy. All three look different but have in common direct

instructions on staving conservation problems with simple actions by anglers and hunters and consumers. Stop Aquatic Hitchhikers tells how simple measures taken before going to the water heads off big problems for fish and fowl. Habitattitude promotes awareness among pet owners, and SMARxT DISPOSAL encourages responsible actions with unused drugs. All three, combined with their associated Web sites, prescribe good conservation through your everyday actions. ♦



Habitattitude™
 PROTECT OUR ENVIRONMENT
 DO NOT RELEASE FISH AND AQUATIC PLANTS



www.Habitattitude.net



STOP AQUATIC HITCHHIKERS!

Prevent the transport of nuisance species.
 Clean all recreational equipment.
www.ProtectYourWaters.net



SMART DISPOSAL

A Prescription for a Healthy Planet



Freshwater Folk Festival

Friends of the White Sulphur Springs National Fish Hatchery, WV, hosted the 3rd Annual Freshwater Folk Festival in September 2007. Appalachian art, music, dance, and local cuisine permeated the cool mountain air. Hatchery biologists and concerned citizens provided hands-on activities for attendees to promote an appreciation of freshwater conservation. The hatchery is one of seven rainbow trout brood stock facilities in the country and leads in imperiled mussel work. ♦

POSTCARDS

Leadville National Fish Hatchery



View of the original hatchery building at Leadville National Fish Hatchery in Leadville, Colorado. In 1889, the Leadville hatchery was established at the base of 14,000 foot Mt. Massive to produce and distribute trout throughout the Rocky Mountain region. Fish were originally distributed via railroad and mule. Today helicopters and llamas get the job done. From its origins more than a century ago, Leadville was designed to be attractive to visitors and it has always attracted anglers, picnickers, sightseers, and postcard collectors. Leadville is the second-oldest National Fish Hatchery in existence and its main building has been placed on the National Register of Historic Places.

By Mark Madison

By Craig Springer

Robert Thoesen



Robert Thoesen posed for this portrait for his 1999 induction into the Fish Culture Hall of Fame.

Loading fish for Lake Powell aerial stocking.



USFWS

From the cool, thin air of the wild southern Rocky Mountains to the staid halls of Washington, D.C., Robert Thoesen, had a career in the U.S. Fish and Wildlife Service that spanned the part of four decades. Starting at the bottom, he worked his way to the top – and 25 years after his retirement his mark is still measurable.

Thoesen was a part of Tom Brokaw's "Greatest Generation," those men and women lauded for their sacrifice and dedication to duty

in World War II. He answered the call of service to his country, still a boy of 17; he missed his high school graduation to get to the front lines in the European theatre. He attained a sergeant's rank in General Patton's Third Army and stayed on as a guard at the Nuremberg trials.

Back home, Thoesen took advantage of the G.I. Bill and earned a fisheries degree at Colorado State University. By 1952, he was employed in fisheries conservation earning \$2,750 per year, and already a father to his son John, who would follow in his footsteps. His career commenced at a small station at Eagle Nest, New Mexico, attached to Leadville National Fish Hatchery in Colorado, collecting trout spawn from highly desirable rainbow trout adept to high-country survival.

Next, Thoesen spent several years at Williams Creek National Fish Hatchery in Arizona, culturing trout for tribal waters. Fish culture was primitive then. He was issued a 30-30 rifle and hunted feral broomtail horses on the Fort Apache Indian Reservation. Their flesh was rendered to fish feed, mixed with

locally grown pinto beans. The process was expensive and not very nutritious for fish. Necessity spawned innovation: Thoesen sought to change how fish were fed, and his desire is found in the sacks of pelleted fish food used on hatcheries today. He experimented with pelleted trout diets in 1955 - 56. His innovation in fish food reduced labor costs, storage space, lessened energy use by eliminating refrigeration, and opened the door to automatic feeding. It also produced healthier fish. And it's used in nearly all species of cultured fish the world over.

"Bob's greatest contribution to our profession centered on new technologies for fish feed, brood stock, distribution, and fish health to name a few," said veteran biologist, Roger Schulz, Deputy Assistant Regional Director for Fisheries in the Southeast Region. "During his tenure, the Fisheries program saw his innovation – innovation sought around the world. His mark on the art and science of fish culture is indelible."

Thoesen wended through Dexter National Fish Hatchery in southern New Mexico, on his way to Cortland National Fish Hatchery and training center in New York. By 1960, he was in his first stint in Washington, D.C., as a specialist in operations, maintenance and development. It was his responsibility to see new facilities built around the nation at the height of federal water development projects created in many watersheds around the country. Hatcheries were built for mitigating losses to fisheries, and Thoesen saw them through design and construction.

Thoesen made a mark in fish distribution, too. Fish hauling, to the uninitiated, may seem as simple

as putting fish in water and driving. But it is not. During Thoesen's career, the profession rapidly evolved away from art toward science, and better use of technology. Thoesen created a standardized hauling method for trucks, with hatcheries using nearly all the same tanks and pumps, with tanks designed to minimize mortalities. That meant a greater number of fish could be safely transported longer distances. Thoesen also designed systems for aerial hauling; building tanks for large airplanes that could stock large or remote waters with relative efficiency.

Thoesen returned to Washington, and served nearly four years as the Chief of the National Fish Hatchery System. He credits employee development as one of his greatest achievements. During his tenure as chief, the National Fish Hatchery System began in earnest developing disease diagnostics capabilities, and today employs geneticists, veterinarians and pathologists at nine fish health centers. His son John is a fish health biologist stationed at one of his dad's former digs, Dexter.

"When I think of my father, the first word that comes to mind is 'pioneer,'" said John Thoesen. "He invented needed equipment, improved fish diets, and I remember as a kid watching him build concept models out of balsa wood. Those models were followed by trips to Thompson Pipe and Steel in Denver, where the wood models turned into real hauling tanks – and the designs are still in use."

Thoesen retired to South Carolina and was the founding president of the South Carolina Anglers, Inc., a non-profit that exists to promote fisheries conservation and sport fishing. In 1999, he was honored for

his significant contribution to his profession by being inducted into the Fish Culture Hall of Fame at the DC Booth Historic National Fish Hatchery in Spearfish, South Dakota. Today, he is an active firearms collector and has become an authority in Colt firearms.

Thoesen said his time in the U.S. Fish and Wildlife Service was extremely gratifying. "Fisheries was the world leader back then and I was part of that; we were looked to from all over the world for fish culture information," said Thoesen. "But my greatest contribution was not what I did, but what I received – and that was the opportunity to encourage the scientific advancement of my employees." ♦



USFWS

Robert Thoesen readies a broodstock brown trout for spawning at Alchey National Fish Hatchery, ca. 1955.



USFWS

The vapor trail is not exhaust, but water – and fish – raining over Lake Powell.



USFWS

Aerial stocking, innovated by Thoesen, improved sportfishing.

American Fishes

By Jim Martin

Steelhead *Ten-Pound Lightning*

Steelhead – the green ghosts of the rivers – are elusive and picky. Many anglers fish for months, or even years between fights, but the mystery of the steelhead draws the anglers back even when bites are few and far between. While the Chinook salmon holds the heavyweight title, steelhead are among the most fabled.

Steelhead are the ocean-going version of the legendary rainbow trout of the West. They are native to the Pacific Coast drainages, and have been successfully transplanted to the Great Lakes, South America and New Zealand, proving their adaptability.

Wherever they occur, they engender a following of anglers that chase these fish from the sea to the spawning grounds. Many of these anglers will fish for days for that one gentle tug or that blasting skated fly-take. The more sensible anglers go after fish far more catchable. On Oregon's fabled Deschutes River, steelhead are known as "freight trains" and on the Rogue, the famous "half-pounder." On the Wilson or the Hoh, they are "ironheads" and on the Clearwater they are the "fish with shoulders."

No matter what you call them, they have a unique and complex juvenile life history. They require from one to three years of rearing in freshwater until they have attained the size to allow survival at sea. These successful smolts, downstream migrants, are the survivors who have out-fed and out-fought the siblings that died in competition for food and habitat. They are the few to make the migration to the sea where even fewer will survive a migration of thousands of miles to return from the sea one to three years later. All of this mortality makes steelhead very sensitive to potential overfishing or habitat loss. Some runs of fish are

already considered endangered and their future is in question.

In most of the western North American rivers, steelhead are selectively fished. That is, the wild fish are released to fight again and the hatchery fish are taken home for the BBQ. Fishery managers mark the hatchery steelhead by removing the small adipose fin on the back just behind the dorsal fin. When the adults return, anglers can easily identify the wild fish with intact adipose fins and release them gently in the stream after the battle.

National Fish Hatcheries and State Fish Hatcheries play a key role in producing fish for consumptive use and for tribal fisheries. With so much of the historical habitat either destroyed by development or inaccessible due to hydropower dam blockage, hatcheries play a key role in compensating for the losses.

Many hatcheries are operated with money specifically identified for mitigation of habitat losses. Hatchery fish meet the desires of anglers to eat the fish they catch, while allowing the wild steelhead the best chance of survival when released. Since the angling release mortality is very low, usually between 3 and 10 percent, most of the wild steelhead may delight another angler or spawn the next generation.

Another threat to steelhead is accidental harvest. In British Columbia, Alaska, and the Pacific Northwest, steelhead are incidentally caught in net fisheries meant for much more abundant salmon runs. Fishery managers work with commercial and sport anglers to find ways to harvest salmon while protecting wild steelhead.

Seven National Fish Hatcheries produced nearly five million pounds of steelhead in 2006.

- Coleman National Fish Hatchery
- Dworshak National Fish Hatchery
- Eagle Creek National Fish Hatchery
- Hagerman National Fish Hatchery
- Makah National Fish Hatchery
- Quinalt National Fish Hatchery
- Winthrop National Fish Hatchery

Fly anglers especially love steelhead given they are the only species of Pacific salmon that will attack a floating fly. Summer steelhead are particularly revered for their fly-fishing challenge because they come in from the sea in warmer water. That warmer water accelerates the fish's metabolism, and that intensifies the fish's striking reaction. Winter steelhead are much more difficult to entice with a fly, due to the colder water they swim through, migrating up the spawning rivers.

Whether a fly fisherman or a plug puller, drift angler or a bobber-jig guy – or one of the increasing legion of lady steelheaders – anglers become dedicated to this mythical fish almost to the exclusion of other fisheries. Steelhead become addictive. The mystery of their freshwater-to-sea migration captures our imagination, just like the epic migrations of waterfowl or the Monarch butterfly over North America.

Anyone experiencing the crashing strike, followed by multiple cartwheel jumps and blistering runs will never forget it. Sometimes we are left in wonder, gazing at the broken leader. But the hook is set – in us!

We will chase the steelhead from the Great Lakes to the Pacific Coast, to Alaska and to New Zealand. And we will say thanks to the great fish and the hard-working fisheries professionals who fight for their habitat and produce fish for future generations of anglers. ♦

Jim Martin is the Conservation Director for the Berkley Conservation Institute at Pure Fishing, and the former Chief of Fisheries for the Oregon Department of Fish and Wildlife.



David Leal

Erin Leal angled this steelhead from Oregon's Wilson River.

Fishing for a Future

By Frank Peterson

Anglers' Legacy Asks Avid Anglers to "Share the Sport"

Former President Jimmy Carter once said, "Many of the most highly publicized events of my presidency are not nearly as memorable or as significant in my life as fishing with my daddy." Throughout history, this sentiment rings true. While fishing has evolved from merely catching food to a recreational sport and family bonding activity, it remains an American legacy, handed down from the past, one angler at a time.

Frank Pilney knows this legacy all too well. Growing up in St. Paul, Minnesota, the now tournament angler was introduced to fishing by his grandma. "My grandma used to take me to the tiny little lake in her back yard to fish. We'd pull worms out of the garden and catch bullheads for hours and hours. It was the same magical event every time," he said.

That's why when he heard about the Anglers' Legacy program, which asks avid anglers to share their passion for fishing and commit to take someone new fishing, he quickly got on board.

"We get so caught up in our daily lives that we don't take those important moments to slow down," he said. "I decided to take the Anglers' Legacy Pledge because I believe in the cause."

Since taking the pledge, Pilney has introduced dozens of new participants through educational programs he developed for the Masters Walleye Circuit. His most memorable introduction to date involved teaching grade-school students the basics, and then taking them on an ice-fishing adventure. "Some of the students

came out not really prepared, wearing high-heeled boots," he said. He wasn't sure how well the trip would go. "But to see the joy in their faces when they caught a fish and pulled it up – that was fascinating to me," Pilney said.

Anglers like Pilney are fighting to keep the sport alive after a May 2007 report from the U.S. Fish and Wildlife Service shows participation is down 12 percent over the last five years. In addition to individual angler efforts, a growing list of retailers, manufacturers, publishers, pro-staff and celebrities in the fishing industry are also joining the movement, implementing Anglers' Legacy with in-store pledge drives, sweepstakes and Web promotions.

Created by the Recreational Boating & Fishing Foundation (RBFF) in May 2006,

Anglers' Legacy garnered nearly 10,000 pledges in its first year. A June 2007 survey of Ambassadors (those who have taken the pledge), shows they're taking more than four people fishing after taking the pledge. Most are also "extremely or very likely" to continue

introducing people to fishing in the next year in response to the program.

The survey also revealed the program is having a positive financial impact on the boating and fishing industries and on state fishing license sales. Data from the online survey showed that an Ambassador generates an initial \$120 in fishing tackle and equipment sales, \$166 in boating supplies such as gasoline and boating accessories and 3.2 new fishing license sales. If the program reaches one million pledges, that could mean \$268 million for the boating and fishing industries and the purchase of more than three million new fishing licenses for states. ♦

Frank Peterson is president and CEO of the Recreational Boating & Fishing Foundation in Alexandria, VA.



USFWS Director, Dale Hall (l), former Assistant Director – Fisheries, Mamie Parker, and Matt Hogan, Executive Director of the Association of Fish and Wildlife Agencies, stand behind Dirk Kempthorne, Secretary of the Interior, as he signs onto the Angler's Legacy.

RBFF

More Fish, More Anglers, Better Business

By Gordon Robertson



“More fish, more anglers, better business.” This simple creed guides the American Sportfishing Association. Trade associations exist to serve their members, but in the case of the sportfishing industry’s association, we also represent the interests of America’s nearly 40 million anglers.

Since 1950, with the passage of the Federal Aid in Sport Fish Restoration Act (Dingell-Johnson), now known as the Sport Fish Restoration and Boating Trust Fund, the manufacturing segment of the sportfishing industry pays a quarterly federal manufacturers’ excise tax to the U.S. Treasury. The industry consistently supports this tax, and in 1984 expanded the tax to include additional fishing equipment.

The Sport Fish Restoration and Boating Trust Fund is a model for enhancing fisheries, angler and boater access, and ensuring that state fisheries agencies have adequate and dedicated funding. The Trust Fund also receives that portion of the federal fuel tax attributed to motor boat fuel use. Nationwide, the Trust Fund pays for two-thirds of state fisheries agency programs.

The sportfishing industry supports this law because the federal excise tax invests in the future; as long as there are robust fish populations there will be anglers willing to buy equipment to catch those fish. The sportfishing industry since 1950 has paid out slightly over \$5 billion in federal excise taxes. These payments fund state agencies’ management, restoration and access programs.

Each state receives an annual apportionment from the Trust Fund based on the size of the state and its licensed angler population. The state may then pay for an approved fish management or access project for which it is reimbursed for 75 cents on the dollar by the U.S. Fish and Wildlife Service.

Clearly, fishery conservation in this nation depends on this model. But its driving force is angler participation, and the number of anglers in the U.S. has declined in recent years. That has industry and the conservation community concerned. It should be clear why efforts to get more people fishing are more important than ever.

Fishery management in the U.S. directly depends on anglers.

Overall, sportfishing has a significant impact on the U.S. economy. Anglers support slightly over one million jobs with \$45 billion in retail sales injecting over \$125 billion annually into the nation's economy, with \$7.4 billion going into state and local tax coffers. Some local economies depend on dollars from sportfishing.

We at the American Sportfishing Association encourage you to join with us in supporting the efforts of the Recreational Boating and

Fishing Foundation, the National Marine Manufacturers Association, the Association of Fish and Wildlife Agencies, and others to increase angler and boater participation. Our fisheries and the legacy of fishing depend on it. ♦

Gordon Robertson is the vice president of the American Sportfishing Association in Alexandria, Virginia.

By James Caudill

Reeling in Big Bucks

Economic studies reveal value of fishing

Fish in the creel and coin in the coffer – fishing has its intrinsic and economic values. Fishing as recreation in the U.S. continues to be one of the most popular outdoor

activities. A recent national survey by the U.S. Census Bureau and U.S. Fish and Wildlife Service shows that over 38 million people fished nationwide in 2006, representing

about 13 percent of the population age 16 and older. They spend a good deal of money, too.

Anglers list many benefits derived from fishing: relaxation, the enjoyment of being outdoors, camaraderie – and, oh yes, catching a fish or two. One benefit is often overlooked, yet is quite measurable. That's the economic effects associated with recreational angling. When an angler tosses a lure there's a splash outward through the economy, like concentric rings on glassy waters, that ripples through people's lives.

Fishing invariably entails spending money in some fashion and these expenditures in turn create a variety of economic effects collectively measured by economists as economic impacts.

Fishing is an affordable endeavor for almost everyone. Given that so many people fish, and there is spending associated with it, a substantial amount of economic



Before catching fish, lures must first catch the angler.

activity surrounds the pursuit in local and regional economies. Anglers spend money on a wide variety of goods and services. Trip-related expenditures include food, lodging and transportation. And of course there are costs for rods, reels, lures, hooks, lines, bait, boats, boat fuel, guides and outfitter services, camping equipment, and memberships in fishing clubs and organizations. Because this spending directly affects towns where these purchases are made, angling can have a significant economic impact on local economies, especially in small towns and rural areas near destination fisheries.

These direct expenditures are only part of the total picture, however.

Businesses and industries that supply the local retailers where the purchases are made also benefit from angler expenditures. For example, a family purchases a set of fishing rods for an upcoming vacation. Part of the total purchase price will go to the local retailer, say a sporting goods store. The sporting goods store in turn pays a wholesaler who in turn pays the manufacturer of the rods. The manufacturer then spends a portion of this income to cover manufacturing expenses. In this way, each dollar of local retail expenditures can affect a variety of businesses at the local, regional and national level.

Spending money on fishing can have a significant impact on economic activity. Money changing hands means jobs and paychecks, and that puts tax revenues into treasuries at local, county, state and federal levels.

Nationwide, anglers spent over \$35 billion in retail sales in 2006, resulting in over \$100 billion in industrial output, creating 1.1 million jobs, and over \$7 billion in local, state and federal taxes.

These figures are impressive, but angling dollars have a most profound impact at the local and regional level. Here are some examples that I have studied.

Greers Ferry National Fish Hatchery in Arkansas annually stocks over 1 million rainbow trout, 90 percent of them in Arkansas waters. Angling for these fish results in over \$19 million in retail sales, and 600 jobs statewide that pays out over \$12.5 million in wages.

Orangeburg National Fish Hatchery in South Carolina stocks about seven million bluegill, redbreast sunfish, and striped bass a year, mostly in Georgia and South Carolina. Fishing for them generates over \$6 million in retail sales, 127 jobs, and over \$3 million in job income.

Alchesay-Williams Creek National Fish Hatchery in Arizona, stocks annually about 1.2 million of five trout species in the American Southwest. Those fish generate \$12.4 million in retail sales, 233 jobs that pay \$5.7 million in wages, and \$22.9 million in total economic output.

Ten National Fish Hatcheries in the U.S. Fish and Wildlife Service's Mountain-Prairie Region stocked 32 million sport fish of 9 species over 13 western states stimulating 4.6 million angler-days on the water in 2004. These fish cost the tax payers \$3.7 million to grow to stocking size. That investment in fish created a staggering 3,521 jobs paying \$75.9 million in wages and a total economic output of \$326 million. For every one dollar spent on raising fish, it returned \$105 to the economy and \$5.57 in taxes, more than paying back its original cost.

The reasons are many why people choose to go fishing. But no matter the reason, casting a line casts dollars into the economy and that is good for business and for conservation, and both are good for people. ♦

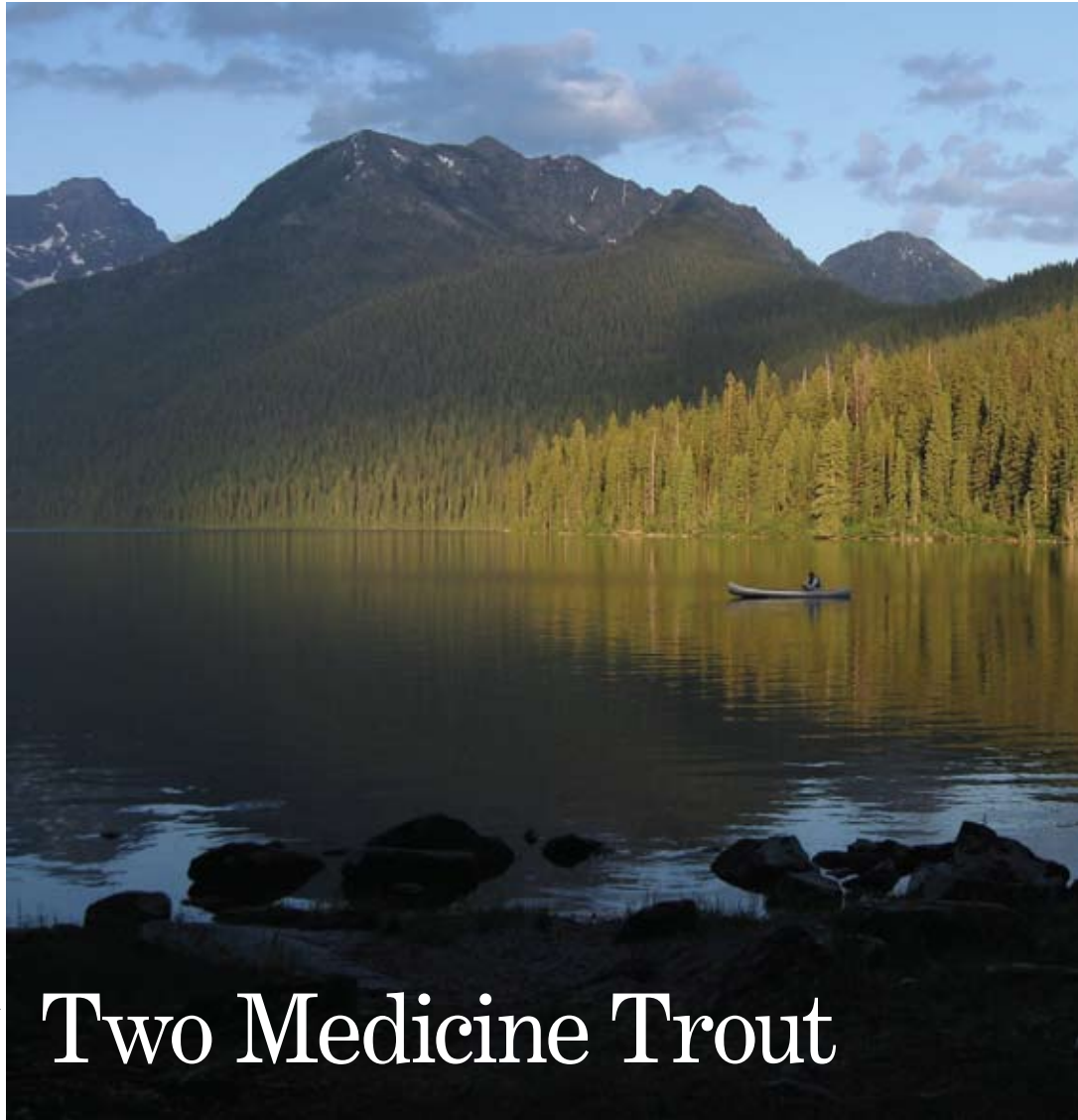
James Caudill, PhD, is an economist with the U.S. Fish and Wildlife Service in its headquarters office in Arlington, VA.



Bass Pro Shops

Fishing reels in big dollars for businesses large and small, and supports conservation funding.

By Mark Maskill



Mark Maskill/USFWS

Two Medicine Trout



Mark Maskill/USFWS

Paddles cut placid Montana waters.

Along the wind-swept slopes of the Continental Divide you'll find trout legendary for their size and number. This place is good medicine, these fisheries found on the Blackfoot Indian Reservation in northwestern Montana. Canada bounds the Reservation's 1.5 million acres to the north and Glacier National Park to the west. Among this breathtaking and pristine scenery lays some of the best trout fishing found anywhere in the United States.

The father of American conservation, mentor to Teddy Roosevelt, and editor of *Forest and Stream* (forerunner of *Field & Stream*), George Bird Grinnell, traveled here. Duly impressed he wrote about the Blackfeet people, their home place, and its natural endowments. Grinnell Glacier is named in his honor.

The Blackfeet Reservation, established in 1851, holds 27 fishable lakes and over 175 miles of streams available to anglers. Waters in the northern part of the Reservation drain into the Saskatchewan River basin, and eventually on to Hudson Bay. The southern waters drain into the Missouri River. Important populations of coldwater fish species, including native westslope cutthroat trout, bull trout and Arctic grayling live in many Reservation lakes. Let the secret be known, pole-bending fishing opportunities exist here in waters purling around pleasant places.

Their place names are memorable: Badger-Two Medicine and Chief Mountain, and Dog Gun, Four Horns, Duck; then there's Medicine Stab, Lower Two Medicine and Goose. They conjure images of the Blackfeet



Nation since 1962. Together, the Blackfeet and the FWCO manage key Reservation waters to create outstanding fishing for stocked rainbow and westslope cutthroat trout. They've developed native trout management plans for portions of the Saint Mary River drainage, and monitor the diverse fisheries over their Reservation.

The Creston National Fish Hatchery, in Kalispell, Montana, provides westslope cutthroat trout and rainbow trout for Blackfeet waters. Creston has produced fish for Montana Indian reservations since 1949. Each year, the Creston hatchery stocks six-inch rainbows into the incredibly fertile prairie pothole lakes on the Reservation, most of which have no natural inlet or outlet stream and were naturally void of fish. In 2006, Creston stocked over half a million rainbow and cutthroat trout, stocking all but six of the 27 lakes on the Reservation. Population surveys showed that more than 60 percent of those fish typically live past the first year.

These fish grow like gangbusters in the fertile lakes, on average an inch a month, more in the summer and less in the winter. Five-pounders fat like footballs are common and plenty of 10- to 20-pound behemoths have been bragged about. The Reservation's lakes teem with trout food: scuds, damselflies, leeches, dragonflies, mayflies, water boatman, caddis, grasshoppers.

Fishermen boast that on a good weekend it is possible to catch and release 100 or more fish – all weighing three pounds or better.

According to Robbin Wagner, FWCO fish biologist, the good fishing on the reservation is expressed in another way: the number of anglers spending a day on the water increased from 82,000 annual angler-days in the early 1980's to about 200,000 per year presently. This fishing has improved employment on the Reservation; only Blackfeet tribal members can guide visiting anglers who pay \$300 per day for guided outings. Around a dozen outfitters each employ from five to

ten guides. Tribal fishing license fees totaled \$148,000 in 2006 and all of that money is required by the Tribe to go back into the Blackfeet fishery program.

At the intersection of the scientific capabilities of Creston National Fish Hatchery, the technical expertise of the FWCO, and the marriage the Blackfeet Nation holds with its naturally endowed lands lays a world-class "Two Medicine" fishery. ♦

Mark Maskill is the manager of the Creston National Fish Hatchery.



Creston National Fish Hatchery biologists set feeder on raceways.

Mark Maskill/USFWS



Large brook trout headed for a Blackfeet lake.

Mark Maskill/USFWS



Westslope cutthroat from Montana.

John Fraley/MFWP

warriors that once roamed these lands and wildlife whose lineages lived here well before Lewis & Clark journeyed through.

Blackfeet Indians refer to personal, spiritual or mystical power as "medicine." Tribal members held in high esteem had two times the medicine as their contemporaries, just as the trout found in the Two Medicine area of the Blackfeet Nation seem to grow twice as large as trout in other Montana lakes.

Though endowed by nature, the great fishing is by design. The Blackfeet Fish and Wildlife Department manages the fisheries with technical assistance of the U.S. Fish & Wildlife Service. The Montana Fish & Wildlife Conservation Office (FWCO), located in Lewistown, has provided that assistance to the Blackfeet

By Wade Fredenberg

Uncle Art's Trout

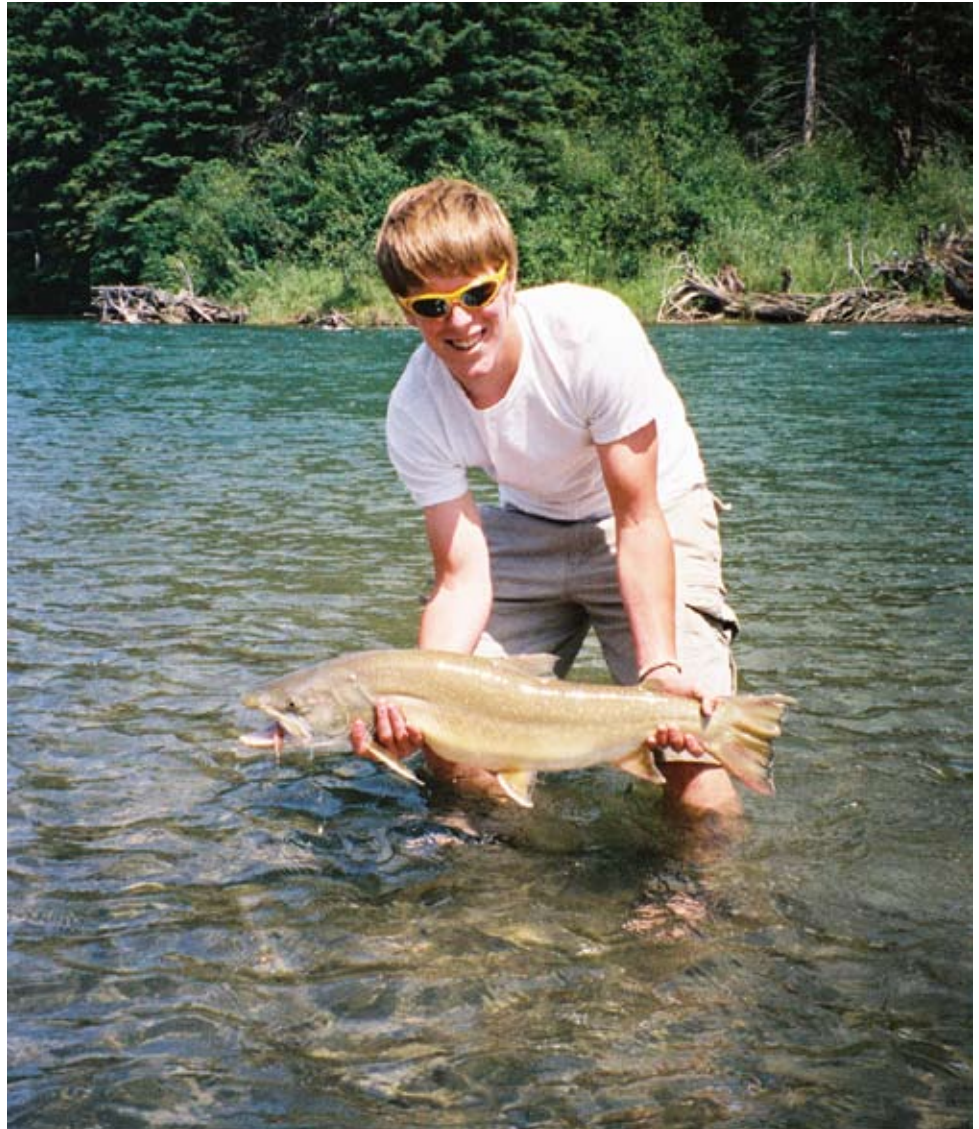
Threatened bull trout swim through a family history

By the tender age of twelve I had developed a grandiose vision to win the big annual fish derby on the Flathead River in northwest Montana. The event was held in early summer, with several days of angling sandwiched between other fun activities. The derby was in fact a "bull trout festival," but we didn't recognize it as that. I was inspired by fish at a very early age; fish were my "destiny" my older brother Mark says. Once I was old enough to control that destiny, fish and fishing became my passion, and eventually my vocation.

The fondest recollections from my youth are centered on bull trout. I memorized the stories my great-uncle, Art Bauer, told me. He was a farmer and a fisherman, not necessarily in that order. He farmed for a living, but he lived to fish. "Plugging for bulls," as he put it, was one of his passions.

In my teens I worked summers on his farm. I vividly recall rising at 4:00 AM on a summer day to change irrigation pipe in the moonlight. Then, still in our irrigation boots, we dashed off in the old blue Chevy pickup to the Flathead River. Uncle Art favored a big red and white Bass-Oreno to plug for bulls. We caught none that day. By noon we were out in the hay fields and I spent the remainder of my waking hours dreaming, stacking bull trout big as hay bales.

My uncle has long passed, and plugging for bulls is illegal today. Years before Art died he gave me his old bull trout tackle. I keep his wicker creel, full of red and white Bass-Orenos, on the corner of my desk. They inspire me. I cherish every plug, especially those marred with teeth marks in the paint from the maw of a hungry bull trout,



Carter Fredenberg on a family outing for bull trout.

knowing they passed through the hands of my uncle.

My brother may have been right about destiny. I'm a fish biologist with the U.S. Fish and Wildlife Service, and part of my duty is to work with bull trout, ultimately to ensure that the native fish legacy persists to be enjoyed by future generations.

Creston National Fish Hatchery where I keep an office has been the fount for an impressive diversity

of studies on bull trout – studies done here, or on fish coming from the broodstock kept here. We learned how they feed, and grew them under various light and temperature situations. We studied their susceptibility to whirling disease, pathogens and pollutants, and how they behaved and reacted to migratory challenges early in life. How they used the stream bottom in their natural environment to avoid predators and how well they challenged competitors, we studied that, too. We plowed new ground

Wade Fredenberg



Wade Fredenburg

Kurt Fredenburg with a bull trout.

in what was known of bull trout aquaculture and their reproductive requirements.

My brother Mark remains mystified about how I turned my youthful passion into a paying proposition. As I cogitate at work over how to “save the bull trout” on a grander scale, I still take advantage of precious opportunities to teach my own two sons Kurt and Brian and Mark’s son Carter about the bull trout that swim through our Montana family history. Uncle Art would approve.

There are new bull trout stories to tell. A couple of years ago at Logging Lake a mountain lion stalked my son Kurt, age 15 at the time. He himself was preoccupied, stalking bull trout with his fishing rod and I – his supposed guardian – was up the creek counting bull trout spawning redds.

There were annual rituals watching the bull trout spawn in mid-September. We would hunker in the weeds along Lion Creek, silently enthralled, as a female bull trout rolled on her side and dug vigorously

with her tail. Then, her squirt of eggs was accompanied by a shudder and a cloud of sperm from the attendant male. Sometimes a smaller male would dart upon the scene, trying to pass some of his genes onto the next generation. The 10- or 12-pound dominant male would defend with hot pursuit.

These life lessons were transmitted to impressionable youths through 12 inches of water in living color – hunter-orange flanks and black pelvic fins edged bright white – flashing in the sunlight dappled by the roughness of the riffles.

My favorite fishing philosopher, Paul Quinnett, in his book *Fishing Lessons* captures the intrinsic value of bull trout: “Let me note that there is nothing more thrilling than to be fishing some little Cutthroat Creek and have a five- or six- or seven-pound bull trout rush up from the dark bottom of a deep pool and grab the ten-inch cutt that took your dry fly. A huge bull trout that comes screaming out of the depths to attack a shaker leaves your line slack,

your mouth agape, and your heart pounding. Seeing and temporarily feeling the power of such a great predator is as rare and wonderful a gift as hearing a wild wolf howl.”

For bull trout, all is not yet lost. I have confidence that 30 or 50 years from now the largely untarnished water quality necessary to keep the bull trout alive will remain. I see the pristine jewels in the “Crown of the Continent” where bull trout evolved will still sparkle in the eyes of our great-grandchildren. For me, the bull trout must be there for those waters to be fully alive.

The 1998 listing of bull trout as a threatened species under the Endangered Species Act placed new focus on its recovery. Major challenges lie ahead, not the least of which is climate change. Bull trout require the coldest and cleanest water of any native trout.

If in its rarity the bull trout remains a highly prized sport fish, the bull trout stories will have the greatest meaning, and in them promise will reside. ♦

Wade Fredenburg is the Bull Trout Coordinator for the U.S Fish and Wildlife Service in western Montana.



Wade Fredenburg

Uncle Art Bauer, Montana fisherman and farmer.

Fish Came First



A long time ago I followed on the heels of my granddad, Dee Brimm, pushing through a field of tall grass. We came across a meandering stream, and he cut two long poles from cane that grew on the bank. From the pocket of his work-stained khaki pants he pulled out long pieces of string, brown-cork bobbers, and fish hooks. Granddad cut open seed balls on top of some weeds and seized small worms. In short order, the bobbers jogged sideways on smooth water under the tug of sunfishes that knew no caution.

I shall never forget being with him on that small Illinois stream, and since that day I've been hooked on fishing. Little did I know then that angling would steer me to a long career as a biologist in the National Fish Hatchery System. I had many occasions to read written historic materials or view artifacts at the D.C. Booth Historic National Fish Hatchery archives from where I recently retired. It was always

moving to recognize the contributions that the hatchery system made to conserve America's fisheries dating back now 137 years.

In December of 1870, a group of fish culturists met in New York City and formed the American Fish Culturists' Association (the name was later changed to the American Fisheries Society). The group resolved "to promote the cause of fish culture; to gather and diffuse information bearing upon its practical success; the interchange of friendly feeling and intercourse among the members of the association, the uniting and encouraging of the individual interest of fish culturists."

Concern for fish conservation at the time had swelled. At the urging of our New England states, a Joint Resolution of Congress, February 8, 1871, was the first federal law concerned with fish and fisheries. This law expressed the concern of Congress that the most

valuable food fishes in the U.S. were rapidly diminishing so as to affect the interests of trade, and the federal government should lead in their conservation. Congress created the Commission of Fish and Fisheries, and President Grant appointed Spencer F. Baird as its Commissioner.

Baird, Congress, and the fish culturists created the template for future federal bird, plant, and mammal conservation. In 1872, the American Fish Culturists' Association petitioned the federal government to establish salmon hatcheries on both Pacific and Atlantic coasts and to undertake a general fish-cultural program. Congress appropriated \$15,000 to plant shad in the Mississippi; subsidize Charles Atkin's public salmon hatchery in Maine; and establish a Pacific salmon egg-taking station in California. The McCloud River station now lying under Lake Shasta would become the nation's first National Fish Hatchery.

During the first 50 years the U.S. Fish Commission directed its energies at commercial food-fish stocks. In the day, planting fish seemed to be the cure for poor fishing, or for improving depressed stocks – but not all energies were directed there. Deputy Fish Commissioner and fish culture

Distributing fish to farmers made for large public gatherings, as in this 1950s photo.



pioneer, Livingston Stone knew the value of habitat conservation and convinced President Benjamin Harrison to set aside part of Alaska's Afognak Island as a refuge for salmon in 1892.

In 1903, the U.S. Fish Commission became the Bureau of Fisheries. The Great Depression in the 1930's brought about an era of water development and civil works projects that lasted over 30 years. Projects related to flood control, navigation, and power generation excised fish populations and habitats. Congress legislated an infrastructure of hatcheries to mitigate the effects of these projects. To rectify the causes of the Dust Bowl, the U.S. Soil Erosion Service (later called the Soil Conservation Service and now Natural Resources Conservation Service) helped farmers build ponds. As an incentive, the National Fish Hatchery System supplied farmers with fish. Over five million ponds dotted the American countryside, staving erosion, stabilizing farmland, creating bird habitat – and habitat for anglers.

Fisheries management blossomed as a new scientific discipline in the 1940's. The Bureau of Fisheries became the U.S. Fish and Wildlife Service. We would see fish biologists trained in chemistry, statistics, physics, biology, ecology, ichthyology, limnology, fish disease and parasitology, and population dynamics. Our scientists evaluated new scientific methods for managing fisheries.

The passage of the National Environmental Policy Act, the Clean Water Act, and the Endangered Species Act raised the nation's conservation awareness. The National Fish Hatchery System

would become increasingly called upon to restore depleted species and recover those in serious peril. While the fisheries program placed its focus on comprehensive watershed-based conservation programs, a decrease in funding created difficult choices for fisheries managers. Hatcheries had to meet many conservation needs within existing funds. Some fell victim to budget cuts and redirected funds – they were closed or transferred to state ownership.

When I began my career in the 1970's, we still operated a Farm Pond Program. Working as a trainee at our former hatchery along the Mississippi River in Fairport, Iowa, I learned to culture bass and bream under the tutelage of my now dear friend, retiree Wes Orr.

Wes and I worked near a huge circa-1920 abandoned mussel research building. I learned that years ago the U.S. Fish Commission researched raising mussels to restore their populations along the Mississippi River. Commercial button factories over-harvested them for their pearly shells. Old mussel shell remnants punched in a nearby factory were visible then near the hatchery's boundary.

My memories of thirty-some years ago are ligaments linking the past with the future. I am proud of the young scientists fully immersed in new propagation techniques for endangered mussels at National Fish Hatcheries in Genoa, Wisconsin, and White Sulphur Springs, West Virginia.



Joe Fries

Scientists research the endangered Texas blind salamander at San Marco Fish Technology Center.



USFWS veterinarians conduct endoscopic surgery on a sturgeon to learn more about its life history.

Tony Brady carefully gathers larvae from an endangered higgins eye pearly mussel at Genoa National Fish Hatchery.





Pier pressure: fishing bonds families.

Days at Fairport though long passed reward me still. Wes and I traveled throughout a multi-state area sharing fish for farm ponds. The excitement on the faces of those farmers made me stand tall on that old fish distribution truck. The pictures sent to the hatchery in later years showing a farmer and his grandkids with two-pound bass were priceless. The U.S. Fish and Wildlife Service still works with the Natural Resource Conservation Service and farmers to enhance habitat through the Partners for Fish and Wildlife program, creating wetlands and upland habitat, but we no longer provide fish.

Restoring native fish populations has always been a priority for the National Fish Hatchery System.

I remember working with lake trout on hatcheries around the Great Lakes. Then as now, we worked side by side with researchers and management biologists from state, tribal and Canadian governments. Lake Superior's lake trout populations were recently declared self-sustaining, and 2006 saw the last release of lake trout there by the National Fish Hatchery System.

For over 136 years, employees of the National Fish Hatchery System have labored to meet management needs. In the face of serious need, they learned how to culture a variety

of fish species and other aquatic species like mussels, salamanders, toads, and plants. They have been bashed from some members of academia over management decisions that they had no control over. They've been beleaguered by years of declining budgets, and hatchery closures. But through it all they remained dedicated in purpose.

The National Fish Hatchery System has had an incalculable positive influence in conservation; some fantastic fishing across America exists entirely because of it. I recently served on a team that evaluated our rainbow trout mitigation program, and the results were staggering. Not only do we provide high-quality, healthy rainbow

trout to enhance recreational fishing, there's an enormous boost to the economy with minimal investment. The nine million trout coming from the National Fish Hatchery System each year creates nearly 4 million angler-days. That fishing generates \$325 million in total economic output at cost to the taxpayers of only \$5 million.

Since the beginning we have accomplished our conservation work through partnerships with other entities public and private. We've returned native trout to native waters, some on native tribal lands, and all under the auspices of scientifically informed management plans. Sturgeons in the East, alligator gar in the South, paddlefish in the Midwest, trout and salmon in the West – we've worked with them all, and all of them have recreational fishing potential for people to enjoy.

Some may question the value of using hatcheries, but I know that America's fisheries will always depend on help, especially as our population continues to grow. As that puts increased pressure on fisheries, there will be an increasing need for the scientific capabilities we own.

Cast in bronze, these figures pay tribute to 137 years of federal fish conservation at the DC Booth Historic National Fish Hatchery.



Eric Davis



Whether from the bow of a boat, or ankle-deep in pond muck, USFWS fish biologists know that fishing connects kids with nature.

The only thing more impressive than our past is what is yet to come. I'm looking forward to the day, Lord willing, that I might have a grandchild on my heels walking through a field to a nearby stream. Maybe one of my future relatives will also work in the National Fish Hatchery System. ♦

Steve Brimm retired as the manager of D.C. Booth Historic National Fish Hatchery in Spearfish, SD, in 2007. This historic facility is an archive center for the preservation of our nation's fisheries conservation heritage.



Craig Springer

by John Bryan

Walkin' In Jerusalem*



Street vendor Jesus Lopez on Santa Monica Pier.



Surgeon and Iraq War vet P.J. Rue and son Milo angle sunfish at Maryland's Greenbriar State Park.

* *Ricky Scaggs' heart-thumping, adrenalin-pumping, hope-lifting, "I-wanna-be-ready" anthem that blared the dawn launch of the wide-grinning, toe-tapping, engine-revving anglers at the 1985 Red Man All American on Lake Havasu. (And the author's nomination for our national go-fishing song.)*

At D.C.'s Fletcher's Cove Dan Ward and his 13-year-old daughter Margaret fish with red-and-white-bobbered spincasters. "Rivers seem to attract everyone," he says about this place where he's worked since a teenager. "We get people who can barely afford to pay for worms and people who can afford anything and who compare this to their recent trip to Paraguay. President Carter jogged here and would stop to chat about fishing."

In his Foreword to the 2007 book *TAKE ME FISHING*, Carter writes, "While fishing I have come to know and learn from people who live completely different kinds of lives."

What is it with fishing? Is there a single ingredient that spawns the fishing bug? A common theme that permeates the entire spectrum? A tie that binds the bigwater marlin hunter to the sit-on-the-bank bobber-watcher?

In Maryland's Greenbriar State Park orthopedic surgeon J.P. Rue, back from a half-year in Iraq, casts for bluegills with his nine-year-old son Milo. "My unit did two or three hundred surgeries – half on Marines, half on Iraqis." J.P. learned his favorite pastime from his great-grandfather, Minnesota lumberjack Milo Stillwell.

And on a sun-blinding 108-degree day at Phoenix's Papago Ponds, Jesus Placencia – a Mexico-born roofing tile worker – fishes with his grown son David. "I started liking it because he did," grins Jesus, recalling taking a five-year-old David fishing because he thought that's something fathers should do.

Ask 100 anglers about themselves and you'll find no economic profile, no social profile, no intellectual profile. Ask those same 100 anglers why they fish and common themes will emerge. They were taught by their parents and grandparents. They like being outdoors. But ask them to articulate the precise attraction of fishing – fishing's *raison d'être* – and they have difficulty.

Joan Wulff, grande dame of fly fishing, observes: "Old age is approaching but I don't want to limit my enjoyment of the sport by defining it . . . This very ordinary woman, having had an extraordinary life through the magic of sportfishing, plans to continue."

At Shipman Pond near Cleveland Stephen Seifried fishes with his 7- and 11-year-old daughters Ana and Camille. Stephen helps run the "smart house" infrastructure of The Cleveland Clinic – a 10-million-square-foot facility with 35,000 employees. "Just to be by myself, just relaxing," he explains his love of fishing. "We have so much around here – the lake and the river . . ."

On North Carolina's Ocean Crest Pier Terri Reed, an administrator at the McGuire Nuclear Station swims a mullet minnow for flounder. "I just lived for grandpa's visits," she remembers, "cause I knew he was taking me fishing. I was just a little bitty thing . . . My husband'll tell you – I like fishing even more than any man he's ever met."

Some anglers claim a fishing bloodline. Pulitzer winner John McPhee says, "I fish because my



Author John Bryan on Richmond Virginia's James River.

father did. And I began fishing with him at least 70 years ago." His father, avid angler Dr. Harry R. McPhee, was chief physician for the U.S. Olympic Team and treated athletes such as Bill Bradley in

Tokyo and Muhammad Ali (then Cassius Clay) in Rome.

On Lake Poway near San Diego floats an electric-powered boat containing Mike Belding, his wife



Lisa, and children W.D. and Jessie. Mike's career is with the Marines – more than 20 years including 23 countries and 6 deployments – piloting a phrog, the Viet Nam-era workhorse helicopter. Mike grew up fishing with his father and grandfather in Pennsylvania. The military has provided continual moves to new locations, but there has been a constant theme: "Fishing is the first thing we thought of when we got here."

Fishing is available almost everywhere there is water: from Central Park's duck ponds to Patagonia's trout streams. Some anglers say it's the challenge that attracts them. But Verlyn

Klinkenborg, member of The New York Times editorial board, says this: "People spend enormous amounts of money for access to easy fishing. Really hard fishing is usually free."

At Anaheim California's Yorba Park, Phil Chung, aerospace engineer and systems designer for Boeing, says, "I've been fishing ever since I was strong enough to lift a fishing rod. I like being outdoors and fishing helps you unwind."

Last October I spent a few days fishing in a bass tournament on Lake Erie. There was a persistent gale that included freezing temperatures and precipitation. At one point during a storm of horizontal sleet and thundersnow I lashed my little boat to a piling for three hours and watched ice chips whiten my deck. The "relaxation and being outdoors" reasons for fishing were not on anyone's list that day. But I caught a keeper!

Dr. Donnell Thomas told me that he worked continual long hours for weeks with sick and dying patients, and that when he would finally get a day off to go fishing, "It allowed me to experience hope and see that the world can be a nice place. I needed that." Then he used the words "very important" to clarify the relationship of fishing to his cancer research.

And he told me a story about his now middle-aged son, Don:

"Once when Don was six years old two men invited me to go trout fishing on opening day. This was in upstate New York, and opening day is special there. Don asked if he could go with me. As diplomatically as I could I explained that he couldn't go. The men who had invited me were new acquaintances, and it just wouldn't be right for me



to take him along. Don accepted this as best he could.

“I got up about 4:00 the next morning and going down the stairs I almost tripped over Don. There he was, already dressed and wearing his jacket and boots. I said, ‘Don, what are you doing here?’ And he replied, ‘I know you said I couldn’t go, but I thought I should be ready just in case you changed your mind.’

“Of course I had to take him along. Those men became great lifelong friends.”

Hope is an eternal and invigorating spring. Some writers have noted that fishing offers continual opportunities for hope. ♦



Nuclear station administrator Terri Reed on North Carolina’s Ocean Crest Pier.

Richmonder John Bryan has written about fishing for *Sports Illustrated*, *Field & Stream*, *Gray’s Sporting Journal*, and *Bassmaster*. He edited the book, *Take Me Fishing. 50 Great Writers On Their Favorite Sport* (Skyhorse 2007), which includes a Foreword by President Jimmy Carter, and donates all royalties to the FishAmerica and Future Fisherman Foundations. Bryan was awarded the James River Association’s Guardian of the River Award for his 1997 book, *The James River In Richmond*.



Aerospace engineer Phil Chung at California’s Yorba Park.

By Lee Allen

Fish in the Forest

Gila trout recovery benefits angling

Nature's palette was never more vivid with skies a deep blue, clouds a pure white, and forest pines an intense green having been washed clean by an overnight rain. It's an often-repeated pattern among tall trees sandwiched between Gila and Aldo Leopold Wilderness acreage north of Mimbres, New Mexico. This is home and habitat for deer, elk, bear, turkey, and other critters having a preference for solace and sanctity.

Here, at Continental Divide elevations over 7,000 feet, you'll find small mountain trout brooks just a few feet wide and barely deep enough for fish to successfully play hide from the seekers. It's here, specifically in Black Canyon Creek, that you will now be able to angle for a fish that has been off-limits for half a century.

Gila trout, referred to by one outdoor writer as "swimming expressions of antiquity – artifacts of epochs past," are back in all their olive-green, coppery, and golden-yellow beauty. And in a been-there, done-that world, their return is a welcome one. The Gila trout has a long history, showing up in a trapper's log books in the early 1800s – "a clear stream at the confluence of the West and Middle forks of the Gila River...filled with fish."

Native only to the more remote high country reaches of the Gila River drainage in New Mexico (and the Verde River in Arizona), they once frolicked and flourished in 600 miles of streams. Until they were almost gone, little was known about the fish



Bill Roston

Off limits for half a century, the Gila trout was downlisted from endangered to threatened in 2006, and now offers a unique angling opportunity in New Mexico.

and even less concern was expressed with the exception of a succession of conservationists beginning in the 1920s. So little was known about the fish's biology, that it wasn't until 1950 that the Gila trout was formally recognized as a new species – one that almost died out had it not been for dedicated restoration efforts.

Their numbers and playground size have both been reduced over the years, but their Endangered Species Act listing, in effect since the 1973 inception of the ESA, has recently been dropped from "endangered" to "threatened" and limited sport fishing was authorized last year. Angling opportunities opened up with a 90-day barbless-hook, catch-and-release season at Black Canyon Creek (with additional opportunities

at Iron, McKenna, and Sacaton Creek).

For those who have never seen nor thought about the prospects of pursuing Gila trout, here's what New Mexico Game & Fish Department's Wildlife Notes has to report: "This trout is common in the mountainous headwaters of the Gila River draining in Southwestern New Mexico and Southeastern Arizona, presently limited to several small streams in the Gila and Aldo Leopold Wilderness Areas. The fish remains small in the streams with larger specimens in the range of 12 to 13 inches long. Gila trout older or longer than this are relatively rare. Look for Gila trout under shady bushes and trees or in deep pools. Their diet consists of

aquatic insects such as caddisflies, mayflies, and beetles.”

“These fish are an anglers dream,” says Greg McReynolds of Trout Unlimited in Albuquerque. “They aren’t college educated. You don’t have to match the hatch. If you put a fly in the water, they’ll bite it. They take artificials with glee and fight like the dickens. And even though you can only catch and release these beautiful fish, you can quickly fall in love with Gila trout.”

Conditions constantly change, but McReynolds found any kind of bead-head wet flies to be most effective fishing Black Canyon Creek, catching trout up to 14 inches long. “Even though these are skinny waters, small in size and shallow in depth, Gila trout have adapted to live in that kind of environment and are used to surviving in tough conditions. Anglers can enjoy fishing here with the potential to catch some really good-sized trout.”

Although it’s a 30-mile jaunt through the woods to get to nine fishable miles of that particular creek, Paul Turner, president of the Mesilla Valley Fly Fishers, prefers an even more ambitious route to find his fish. “I like Iron Creek because



Lee Allen

Gila trout biologist, Jim Brooks, has dedicated two decades to trout conservation in New Mexico and Arizona.

of its remoteness,” he says. “It’s about a seven-mile hike at 8,000-foot elevation into a portion of the creek with a nearly pure strain of Gila along with a chance of some hybrids up to 12 inches on the hike in from Sandy Point trailhead.”

Whatever waters are fished, Jim Brooks, supervisory fisheries biologist with the New Mexico Fish and Wildlife Conservation Office, knows them well. Brooks has spent 20 years on both the Gila and Apache Trout Recovery Teams responsible for preparing these waters to receive Mora National Fish Hatchery transplants as well as shepherding the fish into their new homes in stream-to-stream transfers.

“These are feisty fish,” he says. “These are wild fish, aggressive, wily, and hard to catch because of an innate instinct for survival.”

“Gila trout have their wild genetic diversity. When you bring a stream Gila into a hatchery and try to train them to be brood fish, they just murder each other because there’s always a dominant fish that will assassinate the rest. Anglers will be pleased that we’re stocking first generation offspring from truly wild fish.”

So anglers can expect not only an aggressive response to their presentations, but a fairly frequent one because of a growing population. “The Mora National Fish Hatchery and Technology Center went from part-time Gila trout producer to full-time in 2003,” says its director, John Seals. Stocking rates depend on specific stream size and condition with a normal minimum transplant load of 500 fish. “We’ve probably stocked in the vicinity of 15,000 fingerlings from the Main Diamond lineage and several thousand from the South Diamond genetic pool as well.”

Brooks says stocking size varies from three-inch fish to start a new population to the eight to 10-inch fish stocked in Black Canyon and the Upper West Fork in 2007 – along with some sizeable four-year-old broodstock fish. And to whet angler appetites for the 2008 season, some two-foot-long retired Main and South Diamond brood fish were stocked last fall, according to Seals.

“The downlisting and short trial season in 2007 represent historic occasions,” says David Propst, restoration project team leader for New Mexico Game & Fish. “In my job, I deal with endangered species and frequently feel like I’m writing epitaphs. But the Gila trout downlisting brings satisfaction and a sense of cautious optimism that we can ultimately get it off the Endangered Species List entirely.”

“Despite naysayers over the years, we’ve arrived at the point of making the Gila trout a sportfish and agencies have come through on their promise to the public to recover this fish by doing things on the ground, the nuts and bolts of conservation at the biologist level implemented in the field with limited personnel, funding, and resources backed up by a lot of dedication.” Propst cites U.S. Fish and Wildlife Service, New Mexico Game & Fish, Arizona Game & Fish, and the U.S. Forest Service as key players over the past two decades.

With the heavy lifting done, anglers can now enjoy the result. ♦

Lee Allen is a freelance writer in Tucson, Arizona



Homing Instincts

By Craig Springer

Blue lines on a topographical map look like they were pulled from the pages of a medical book. The blue-ink blood of small creeks feed bigger ones, growing fatter as they glide toward the map margins. It's the vascular system they depict, the waters moving toward the heart. This leaf-like pattern mirrors the veins on the sycamores that lean over Indian Creek.

The last time I fished Indian Creek on the Ohio-Indiana state line, I remember it for the heat heavy on my shoulders and the incessant shill of cicadas. It was 1988, and we'd gone without rain for a long spell. The trees looked worn for the want of water. They looked like I felt then following the untimely death of my brother; I lived a month of funky-blue Sundays and was soon to seek psychological distance. Despite the years and miles, my homing instincts

always pull me toward this place where I came into my own. Nearly two decades poured downstream before I waded its waters again. I returned for a brief time with my young boy, Carson, in May 2006.

Creek water is nature in its most beautiful form. The vagaries of flow are endless, the sinuous movements constrained only by the contours of banks, like fluid handwriting constrained to lined paper. Moving water has that habit; the loops and bends tease outside the lines.

Indian Creek burbles over Silurian limestone slabs flecked with fossils where crawdads hide by day and greenside darters tarry, pressed by flow on their paired fins. The water pours out into the throat of a greenish-purple pool. There, the flow is still and silent with places secreted under impenetrable shadows cast by

low-hanging boxelders that strain not to fall in.

Carson and I pause here, his interest drawn to digging sand on a gravel bar. Mine digs deeper, pensive in a platinum clarity, pondering the past and the future removed from the place where I felt most alive. What is real and what is illusive, they reside on the same contour. I had been in this reach of stream a hundred times before. I'd seen it in every season, walking through tall corn or deep snow, always in pursuit of fish or fowl, with a rod or shotgun, a seine or binoculars. Events that have never left me reeled out in moving pictures in the spaces behind my eyes.

Across from this gravel bar, six sycamores that must have germinated together stand shoulders apart their roots ever wet in creek water. The dark voids between the

thick roots and under the bank look gruesome, like twisted mouths agape in agony. Tree trunks sprout out of their heads and reach into a moving sooty sky of variegated grays. In the channel there used to reside the largest of deadfalls. An ancient sycamore had lodged there, snugly ensconced, and a deep hole scoured beneath it. I watch from another time the heavy bronze swirl on the smooth water; I feel in my forearm the lunge of a smallmouth bass lured out of its lair.

That deadfall is now a ghost, nowhere to be found. Only a titanic flow could have moved it. The deep scour-pool is filled with a flat-flowing strait of pebble-stones populated with edgy minnows and a raft of redhorse seen only for their prismatic tilt reflecting the sky's gray as they peruse the bottom. They leave "smoke" wafting in the water where their fleshy lips turn up stones.

Overhead, a belted kingfisher bounds and swoops, it passes over me and Carson in a blur of slate-blue. It skirts the waters with wings pushing air, coming through this green riparian hall the color of a wet lime. The kingfisher lifts itself upward at the last to light on a snag where it hunts for stoneroller minnows. He gives a grating chatter coming to the perch, as if my son and I have intruded. But I feel like I'm in solution with the water that swirls around my legs.

Together Carson and I fished, hunted fossils, caught crawdads, and scouted out Indian mounds and an ancient bear-pit earthwork. We spent a week in this place, father and son, where I had spent an entire liminal season becoming a man. This is the place where I discovered that novel sense of freedom from parents, experienced my first beers, and grasped that there are other things to find outside your natal creek valley.

In the press of two decades I see that habitats, like people, they change.

And I see that the real meaning of any place, like any person, cannot be entirely known. Always there will be something new to discover about anywhere, and discovery only comes with nearness. You could take an immediate liking to a place, but what it takes to really love a place comes only when you know its nuances. And this is an enigma: love requires understanding, but understanding can never be fully acquired.

In those precious few days with Carson at Indian Creek, the husk of my ordinary existence fell aside. I reached back to my boyhood and found new things in old pools, and fell more in love with my boy.

Maturity affords me a rare angle of vision. Meditations have married the meanderings of a little blue line coursing toward a map margin. A powerful past owns providence, and the cursive blue-ink blood draws me toward the heart. ♦

Craig Springer is a fish biologist in Albuquerque, NM and the editor of *Eddies*.

Carson Springer angled a mixed-bag of creek chub, striped shiner, smallmouth bass, and longnose gar in a week of fishing his dad's home waters.



Photos Craig Springer

U.S. Fish & Wildlife Service
<http://www.fws.gov>

Spring 2008



Exceeding expectations

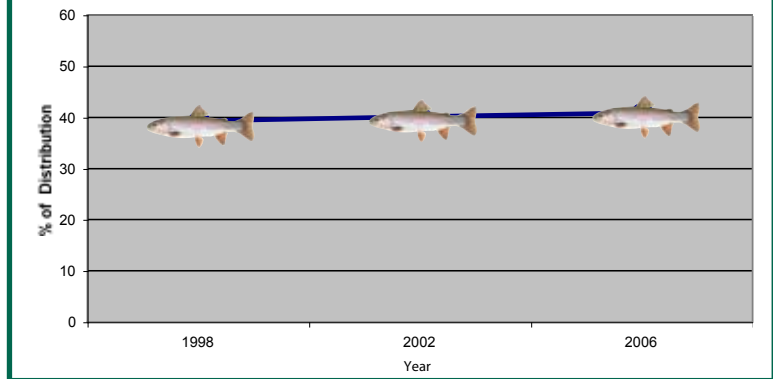
The Sport Fishing and Boating Partnership Council recognized the National Fish Hatchery System eight years ago as “A System in Peril.” The Council concentrated on mitigation rainbow trout fisheries as a fundamental charge to the NFHS. The Council recommended that, “Until legislation is enacted to require reimbursement, current funding for NFHS mitigation operations must be maintained and must not be redirected for any other purpose.” We face emerging conservation issues, increased duties restoring aquatic populations, and are called upon to participate in the recovery of imperiled species. Yet we have gone beyond the Council’s expectation. Our rainbow trout production has continued to be a primary area of emphasis throughout the last decade. The NFHS holds a steadfast commitment to recreational angling.

Dr. Stuart Leon, Chief
 National Fish Hatchery System

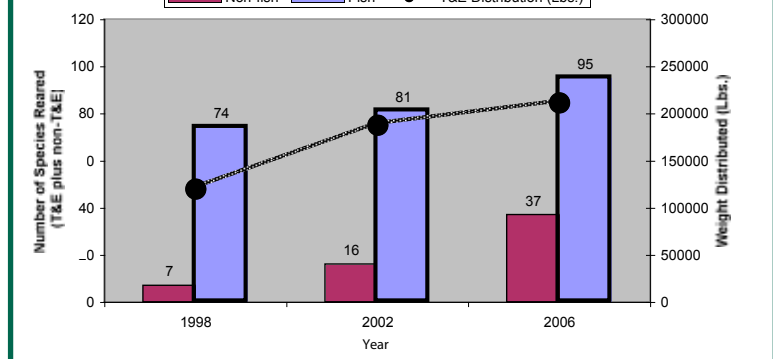
Fish and Egg Distribution National Fish Hatchery System

	1998	2002	2006
Fish Number (Millions)	164.3	150.7	135.1
Fish Weight (Millions Pounds)	5.7	5.4	5.1
Eggs (Millions)	121.5	95.9	165.8

Rainbow Trout Weight as a Percentage of Annual NFHS Distribution



Number of Species Propagated by the NFHS (bars) and Weight of Threatened & Endangered Species Distributed (line)



Eddies

Reflections on Fisheries Conservation

U.S. Fish and Wildlife Service– Fisheries
MS ARLSQ 720
4401 North Fairfax Drive
Arlington, VA 22203

STANDARD PRESORT
 POSTAGE AND FEES

PAID

U.S. DEPARTMENT
 OF THE INTERIOR
 PERMIT G-77