



The Lateral Line

The Newsletter of the Utah Chapter of the American Fisheries Society

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Winner, Winner, Salmon Dinner?

March 13, 2014 in Price marked a new, competitive, and fun event for Utah Chapter members. First year committee member, Dan Keller, worked with the Helper Gun Club to organize our first fundraising trapshoot. Twenty three Chapter members showed up to compete and 12 others came out just for fun, a turn out that thoroughly impressed the Executive Committee. Nicole Nielson bagged first place shooting an impressive 23 of 25! A second place tie was settled after one round by Stuart Bagley, leaving Cody Edwards in third place. Thanks to all participants for a great time!!



1st Place 2014 Trapshoot
Nicole Nielson, UDWR



2nd Place 2014 Trapshoot
Stuart Bagley, UDWR



3rd Place 2014 Trapshoot
Cody Edwards, student



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2014 Awards

At our 2014 meeting in Price we celebrated our colleagues who have made outstanding contributions to fisheries over the last year. Special thanks to all who submitted nominations. Congratulations to the following 2014 Award Winners:

Lifetime Achievement Award – Dan Duffield, US Forest Service



Dan Duffield has devoted 31 years of his life to managing and promoting fisheries conservation across the country. Dan began his professional career as a fisheries biologist in 1982 when he went to work for Dale Hepworth in the southern region of Utah. He worked as a southern region fisheries biologist until 1989. During these early years he obtained great experience working with various salmonids but was recognized for his exemplary work in the introduction of splake into Utah. In 1989, Dan went to work for the federal government on the Dixie National Forest (he stayed close but went far). In 1991, Dan was recognized by the Dixie National Forest for his superb work and received the “Innovator of the Year” award for outstanding leadership of the Dixie NF fisheries program. In 1992, he moved to West Virginia and went to work as the Monongahela National Forest fisheries biologist. Dan continued his great commitment to fisheries resources on the Monongahela NF until 1997. During this time he was recognized by the Chief of the Forest Service for his outstanding service and received three “Rise to Future “ awards for his

contribution to riparian habitat conservation. In 1997 Dan decided to move back west and went to work as the Fisheries Program Leader for Region 4 of the USFS in Ogden, Utah. This is the current position Dan holds. During this time Dan has been instrumental in providing leadership and guidance in fisheries management to 13 national forests. In 2001, Dan served as the acting Columbia River Anadromous Coordinator for Forest Service in Portland, Oregon. More recently (2012), Dan was instrumental in streamlining the USFS NEPA process for handling piscicide proposals from state agencies in Region 4. This streamlining work positively affects Utah, Nevada, and parts of Idaho and Wyoming and has already been put to work on a recent Colorado River cutthroat trout restoration project in NE Utah located on the Ashley National Forest. When needed, Dan is always just a phone call or an email away for advice and help. Dan is recognized and regarded highly by his peers as an outstanding fisheries biologist who has dedicated much of his adult life to promote fisheries conservation.

Professional of the Year – Chris Penne, Utah Division of Wildlife

Chris has exemplified and raised the bar of professionalism exhibited by Division biologists. Chris takes extra effort to collect data on flatwater fisheries in the Northern Region such as age and growth, angler pressure, mortality, etc. These data are changing the way our Aquatics Section views monitoring and is allowing the Division to have biological and statistical power behind management recommendations. Chris developed a regional aquatics flatwater strategic sampling plan for

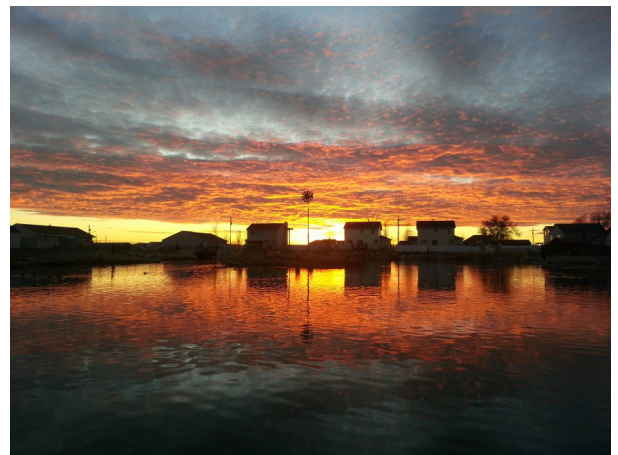


2014 Awards

northern Utah last year. The Aquatics Section is now using Chris's plan as a template for the entire state and the end product will be 1) more streamlined and efficient sampling for flatwaters across the entire state, 2) as previously mentioned - data that is actually useful to make defensible management recommendations, and 3) an ultimate savings to the Division. Chris not only completed his workplan last year, but he was given a lot of extra work keeping the Community Fisheries Program running while this position sits vacant. The Community Fisheries Program in northern Utah is extensive and Chris has not only kept this program running smoothly while the Division decides on where Community Fisheries fits into the new Wildlife Recreation Program, but he continues to pursue additional opportunities for new community fisheries- all above and beyond what he is required to do in his regional workplan. Chris also played a critical role in the discussion with anglers regarding the Willard Bay inlet and as a new manager for the Northern Region, this was greatly appreciated. The amount of time talking with anglers, researching walleye biology, and developing/presenting solid and defensible information on Willard Bay is a great example not only of the professionalism of Division biologists, but how the Division remains credible with the public. In addition, Chris remains on the cutting edge of many disciplines, including reservoir fish habitat with the structures that he has installed and monitored in Rockport Reservoir last year. Chris has made countless contributions in his tenure with the Division. Chris epitomizes what a good employee should be and we're lucky to have him as a member of our family.

Partner of the Year—Roy City

Roy City has cooperatively managed Meadow Creek Pond, in partnership with UDWR, since 2005. One of the state's top community fisheries located in the heart of a suburban neighborhood, Meadow Creek Pond is clean and well managed. Roy City consistently goes above and beyond in their management of the fishery and surrounding area; it is clear that Meadow Creek Pond is a source of pride for the community. Roy City has played a large role in the biological management of Meadow Creek Pond. The city has dealt with low oxygen by installing an attractive windmill aerator, controlled an overabundance of aquatic vegetation by purchasing and applying herbicide, and been innovative in hazing of problematic birds such as cormorants. Many DWR partner cities rely on Division biologists to deal with these kinds of issues, but Roy City has taken initiative and ownership of Meadow Creek Pond, freeing up both Division time and resources. Roy is incredibly active with the angling community, partnering with DWR to host a six-week youth fishing club targeting anglers 6-13 years of age. Each August, the city also conducts a fishing derby to celebrate the pond as part of their Roy Days festival. Roy City places such a high value on their community fishery that each year the city donates money to DWR to assist in the purchase of channel catfish to be stocked in statewide community fisheries. The work that Roy City does to promote Meadow Creek Pond and fishing in Utah is truly incredible and we at DWR are fortunate to have them as a partner.



2014 Awards

Habitat Conservationist of the Year—Justin Jimenez, Bureau of Land Management

Justin played a key role in the development and implementation of an adaptive science based restoration and management plan for the San Rafael River, UT. This plan aims to improve habitat for native fishes over a 50 mile section of river. Justin initiated this project by obtaining grant funding for the planning process. During this process he was driven to ensure that only the best hydrological, geomorphological, and biological analyses were used to guide restoration efforts on the lower San Rafael. This drive required extensive collaboration between geomorphologists, riparian and fisheries ecologists, GIS specialists, and both state and federal personnel. He was instrumental in all phases of project planning and implementation including the experimental approach to restoration design. Justin is passionate about ensuring that the cumulative impacts of different restoration projects over a large scale were accounted for. Justin's organizational and leadership skills are only surpassed by his amazing enthusiasm and positive outlook. His attitude is contagious, and one cannot help but be engaged and forward looking when working with Justin. Because of Justin's efforts the outcomes of the San Rafael restoration project will likely inform restoration efforts throughout the southwest. His restoration efforts will be a lasting conservation legacy for decades and possibly centuries to come.



Award of Merit—Mark Grover, Utah Division of Wildlife

Mark Grover has been instrumental in documenting Boreal toad reproduction in Little Cottonwood Canyon (for the first time in at least 15 years), observing Leatherside chub in Diamond Fork tributaries because of his persistence and extra effort to complete surveys in these areas, establishing a Least Chub refuge site on Deseret Chemical Depot (successful reproduction in 2012), and obtaining additional funding sources to fulfill our program goals (for example \$40,000 Habitat Sensitivity Study in the West Desert that is producing some remarkable results-USFWS). Mark's work ethic and energy are legendary within the CRO Aquatics office, from 15 mile boreal toad survey hikes, to solo 14 hour attacks on Russian olive, to assisting with missing hiker searches in the Wasatch, Mark is a force to be reckoned with. While working in the office Mark has additional experiments running to help us better understand interactions amongst various fish species. He is making the extra effort to get more done in a day than most of us do. Mark is content working on his own and in getting work done no matter what. He feels rewarded simply by making a difference to the resources and deserves credit for his hard work above and beyond what is asked of him. Due to recent budget issues and the inability to hire seasonal help Mark has stepped up and got the work done on his own and through the use of many volunteers so that the work and information could be collected regardless of barriers placed before him. Mark's extensive background in research design and statistics has vastly improved the quality of our population monitoring and the associated outputs.



2014 Awards

Award of Merit—Joe Skorupski, former UDWR, current Wyoming Game and Fish

Working in Utah's northeastern region, Joe has gone above and beyond to prove his capabilities as a fisheries biologist by excelling at each of his projects conducted for the Upper Colorado River Endangered Fish Recovery Program (Program). Razorback sucker recruitment has been limited in the upper Colorado River basin for decades despite an extensive stocking program that has led to successful reproduction in recent years. This guided the development of the Larval Trigger Study Plan, which aims to time Flaming Gorge Dam releases with the presence of drifting larval razorback sucker to promote entrainment into important floodplain nursery habitats in the middle Green River. Under drought conditions, only two floodplains connected to the middle Green River during 2012 spring peak flows, but Joe's participation and dedicated efforts allowed for the successful entrainment of larval razorback sucker in the Stewart Lake floodplain during the very first year of LTSP implementation. Joe's logical approach, timely decisions, and creative use of the Stewart Lake floodgate control structures allowed him to maximize flow entrainment specifically when larval razorbacks were most abundant in Green River drift. Given limited knowledge of the system and Program personnel during his first year with UDWR, this is an amazing accomplishment. Unforeseen obstacles ultimately led to the demise of the 2012 cohort, but Joe only viewed this as a minor setback that he embraced in order to overcome challenges identified during this pilot study. Faced with nearly the same hydrologic conditions in 2013, Joe was again extremely successful at entraining larval razorbacks in Stewart Lake, but this time with plans to ensure success. In the off-season, Joe designed a specialized picket weir that he installed at the floodgate control structure to exclude large-bodied nonnatives during entrainment, thus limiting predation on razorbacks. Joe also used a supplemental water source to maintain water quality in the wetland over the dry summer, providing habitat for entrained razorbacks for two months and allowing them to grow to a larger size to increase survival rates when released back to the Green River. When water quality could no longer be maintained, Joe drained the wetland and monitored escapement closely. He quickly determined that the best way to ensure a safe return back to the river was by creating pulsed flow events by opening and closing the floodgate. In total, 592 wild-spawned razorbacks were released back to the river. This is some of the most exciting news for razorback sucker recovery in decades and the Program is extremely excited to see what is possible in the future. Through his success at Stewart Lake, Joe clearly illustrated to Program partners that the LTSP can be an effective management strategy despite the altered flow regimes we are faced with today. Joe also demonstrated that even during drought years, manually operated floodplains like Stewart Lake can be a vital component of razorback sucker recovery. Moreover, approaches that Joe implemented at Stewart Lake have become a model for success and variations of his protocol are currently under consideration for other floodplains in the middle Green River.



2014 Awards

Award of Merit—Walt Maldonado, Utah Division of Wildlife Resources

Walt currently serves as the Southeastern Region Walk-In Access biologist and Volunteer Services Coordinator, but his services go far beyond his title. Walt is an avid angler and his passion for the sport carries over into his work and volunteer efforts. For the last several years Walt has helped garner support for the Region's Community Fisheries Program. In his home town of Green River, Walt has been the impetus behind establishment, maintenance, and stocking of a fishing pond at the Green River State Park. Additionally, Walt has organized a youth fishing club in connection with the Boy's and Girl's Club there, and administers the State's Community Fisheries Program. Walt has also helped develop underwater habitat for warm water fisheries. In 1993, he was named Conservation Director of the Year for B.A.S.S. (Bass Anglers Sportsmen Society). Green River City named him Volunteer of the Year in 2000. He was named Outstanding Sportsman of the Year by the Division of Wildlife Resources in 2005, and was the Southeastern Region Employee of the Year in 2013. Walt has a long history of dedication and passion in working with Utah's aquatic resources and helping mentor tomorrow's sportsmen and future fisheries professionals.



Award of Merit—Dana Dewey, Utah Division of Wildlife Resources

Dana Dewey served the people of the State of Utah in the hatchery system for over 36 years. Dewey started with the DNR straight out of high school in 1973 and began working for the Fish Culture Section in 1977. During Dewey's tenure with DWR he has moved up the ranks filling roles as assistant hatchery supervisor and hatchery supervisor at several Utah hatcheries. He became hatchery supervisor at Whiterocks in 2007. Here he oversaw production during a complete hatchery facility renovation. Under his leadership, Whiterocks went from an outdated facility to state-of-the-art hatchery with O₂ injection allowing for a 4.5-fold increase in production (from 35k pounds to over 160k pounds). Dewey has been integral to Utah's wild trap egg take program, and has developed techniques and refined protocols for the Duck Fork, Little Dell, Strawberry Reservoir, Sheep Creek Lake, Lake Canyon, and Sheep Creek wild egg takes. Dewey has always been willing to go the extra mile to make sure quotas were met, that fish were healthy, and that regional biologists were happy. He loved having kids at the hatchery, giving them the tour and the opportunity to feed the fish. He and his staff are an integral part of the Northeastern Region kid's fishing. He has shuffled stocking dates to meet all kid's fishing events, and he has just been a wonderful colleague, teaching many of us the ropes in proper spawning techniques. Dewey recently retired from UDWR and we are certainly going to miss his expertise and his professionalism.

2014 Awards

Leaky Boot—Drew Cushing, Utah Division of Wildlife Resources

Each year the Utah Chapter honors a member who has taken uncommon action while in the performance of duties leading to a professional faux pas or SNAFU. The key to this honorary award is that the recipient does not negatively respond to the award, knowing it is given in a light hearted and jovial manner. This year's Leaky Boot has been awarded to Captain Drew for his infamous May 2013 S. S. Minnow trip at Lake Powell



Past President—Drew Cushing, Utah Division of Wildlife Resources

The Chapter would like to thank Drew for his outstanding service on the Executive Committee over the last four years. Drew has been instrumental in developing and implementing the Chapter business plan and ensuring the Chapter is financially stable. It has been a pleasure working with you! We hope you get a chance to relax and enjoy our future meetings!

Best Student Paper

Quantifying Bonneville Cutthroat Trout Spawning Movement Within the Logan River Watershed with Consideration to Potential Metapopulation Structure and Management, Harrison Mohn, USU

Best Professional Paper

Hydroacoustic Repeatability in High Savery Reservoir, Travis Neebling, Wyoming Fish & Game

Best Student Poster

Morphometric Variation in June Sucker (*Chasmistes lirous*) Brood Stock, Desiree Lindley, BYU

Evaluating Potential Impacts of American White Pelican Predation on Bonneville Cutthroat Trout in Strawberry Reservoir, UT, Kevin Chapman, USU

American Fisheries Society Annual Meeting

DE LA RECHERCHE À LA GESTION DES PÊCHES:
PENSER ET AGIR LOCALEMENT ET GLOBALEMENT

FROM FISHERIES RESEARCH TO MANAGEMENT:
THINK AND ACT LOCALLY AND GLOBALLY

QUÉBEC
2014



144^e RÉUNION ANNUELLE, 17 au 21 AOÛT
ANNUAL MEETING, AUGUST 17-21 **2014**



AMERICAN FISHERIES SOCIETY

A Sampling of Proposed Symposium

- International Eel Symposium 2014: Are Eels Climbing Back up the Slippery Slope?
- 38th Annual Larval Fish Conference
- A Retrospective of Fisheries Advances Emanating from the Queens University Biological Station
- Challenges in Managing United State Marine & Estuarine Recreational Fisheries
- Common Challenges and Opportunities for Global Fisheries: An International Perspective
- Dam Impacts on Fishery Resources
- Developing a National Fisheries Data Exchange Standard
- Environmental DNA: A New Tool for Aquatic Conservation and Fisheries Management
- Fire Management and Aquatic Systems: Past, Present, and Future
- Freshwater Fisheries in Canada: Historical and Contemporary Perspectives on the Resources and Their Management
- Future of Fisheries: Perspectives for Emerging Professionals
- Integrated Pest Management Approaches for Combating Aquatic Nuisance Species
- Out of Sight, Not out of Mind: Estimating and Reducing Release Mortality in Commercial and Recreation Fisheries
- Pelagic Fish Stocks on the Move and in the News: Collapse, Recovery, or Something Else?
- Population Dynamics and Sustainable Fisheries for Highly-Migratory Large Pelagic Species
- Protecting Fish in Cooling Water Intakes: Advancing Science to Support Clean Water Act Compliance
- Size-Based Models of Aquatic Ecosystems: Theory and Practice—a Symposium in Honour of Rob Peters
- Big Data Science and Its Impacts on Fish Conservation and Management
- Community Ecology and Trophic Interactions of Fishes
- The Next Generation of Fish Stock Assessments
- Fishing Gear Selectivity and Selective Fishing: Means, Methods, and Implications

For More Information Visit afs2014.org

2015 Meeting—Portland, Oregon

Special Workshop—Evolutionary biology and taxonomy of the cutthroat trout (*Oncorhynchus clarkii*): Is it time to formally revise the currently recognized 14-subspecies biological classification of this species?

Purpose and Objectives of the Workshop

The purpose of this Special Workshop is to bring together a select panel of leading experts on trout evolutionary biology, systematics, and taxonomy to review and weigh carefully all evidence, both old and new, on which the present 14-subspecies biological classification of *Oncorhynchus clarkii*, as well as the several more recently proposed classifications of the species, are based. The panel's principal objectives will be to 1) decide if the 14-subspecies classification remains valid and defensible given the totality of the evidence; and 2) if it finds otherwise, define and provide the rationale for a new set of subspecies that in its collective judgment does satisfy both the old and newer evidence. A third panel objective will be to provide guidelines to those who may be charged with writing new formal subspecies descriptions as to what specific character descriptions and supporting information to include, given the array of new DNA-based methods now being brought to bear.

This Workshop will be staged as a special sponsored project of the Western Division American Fisheries Society (WDAFS), and will be held in conjunction with its 2015 Joint Annual General Meeting with the Society in Portland, Oregon.

The panel will produce a manuscript of its proceedings that will include its findings on the objectives above, as well as all reviews and deliberations of the evidence presented to and considered by the panel, along with the new guidelines for what to include in formally describing subspecies. We propose to seek publication of this manuscript by AFS either in its AFS Symposium Series, its Monograph Series, or as a Special Publication. A summary of the findings of the Special Workshop may also be prepared for publication in *Fisheries*.

Justification for the Workshop

Ever since it was first published by the late R.J. Behnke in 1979, a classification consisting of 14 subspecies (12 extant, 2 extinct) has been recognized for the species *O. clarkii* (Behnke 1979, 1988, 1992, 2002). Behnke wrote that he based his classification on an evolutionary history and sequence of radiations first proposed by David Starr Jordan back in 1894. Jordan (1894) believed that ancestors of all modern Cutthroat Trout traveled up the Columbia and Snake Rivers. From there they reached the Lahontan and Bonneville Basins, the Yellowstone River, the Green and Colorado Rivers, and then, via headwater transfers, the basins of the South Platte, Arkansas, and Rio Grande Rivers. Behnke believed that much of the present diversity, especially at the subspecies level, is the result of events that occurred in the last million years (Behnke 1992). He utilized the fossil record and early chromosome studies, but relied on meristic character differentiation to hone his classification. Although differences of opinion did occasionally arise, he believed that the later allozyme electrophoresis studies of others largely corroborated his classification (Behnke 1992).

However, workers examining levels of genetic divergence and diversity among subspecies using more recently developed DNA-based methods have increasingly called the validity of this classification into question. Also, management agencies charged with making listing decisions and executing recovery actions under the Endangered Species Act (ESA) have increasingly been lumping subspecies together on their own, without input from taxonomists, but citing these newer DNA studies as justification for doing so.



2015 Meeting—Portland, Oregon

For example, in 2001, the U.S. Fish and Wildlife Service lumped the Fine-Spotted Snake River Cutthroat, a separate subspecies in the Behnke classification, together with the Yellowstone subspecies as a single distinct population segment (DPS) when it issued its decision not to list the Yellowstone Cutthroat as threatened under the ESA (Kaeding 2001). The Service based its decision on the lack of genetic distinction found in allozyme and mtDNA markers. A spokesman for the Service later wrote that the Service considers the Yellowstone Cutthroat to comprise but a single DPS everywhere across the subspecies range including the Fine-Spotted Snake River enclave, and that taxonomic validation of the Fine-Spotted Snake River Cutthroat as a separate subspecies was the role of taxonomists, geneticists, and other qualified scientists, not the Service (Kaeding 2006). So the question remains, are there two subspecies in that area as per Behnke's classification, or are these two forms merely spot-size and ecological variants of a single Yellowstone Cutthroat subspecies as the Fish and Wildlife Service and the other management agencies treat them? In 2006, Idaho Chapter AFS held a symposium to tackle this question, but reached no resolution (Van Kirk et al. 2006).

In the Lahontan and Willow/Whitehorse basins of the Great Basin region, what Behnke recognized as three subspecies based on morphological and meristic character distinctions (i.e., the Lahontan subspecies of the western part of the basin, the Humboldt subspecies in the eastern part of the basin, and the Willow/Whitehorse subspecies in its own contiguous basin) have been lumped into just one subspecies, the Lahontan (ESA-listed), based on re-



<http://www.westernnativetroutrout.org/content/paiute-cutthroat/>

sults from DNA methods (Coffin and Cowan 1995). Is this really justified, based on the totality of evidence? A fourth similar-appearing subspecies now believed extinct in pure form existed in the contiguous Alford basin; would this subspecies also be lumped with the Lahontan? And how should the long-recognized but rare (and also ESA-listed) Paiute Cutthroat subspecies fit into this classification? It is also a western Lahontan Basin subspecies. Based on DNA evidence available to date (Nielsen and

Sage 2002; Peacock and Kirchoff 2004), there is about the same amount of genetic divergence between the Paiute and western-basin Lahontan as there is between the western Lahontan and Humboldt forms that the agencies have already lumped into one. So again, is this lumping justified based on the totality of evidence, and if so, should it be extended to also absorb the rare Paiute subspecies?

Most recently, mtDNA and microsatellite DNA studies of Cutthroat Trout of Colorado (Evans and Shiozawa 2001; Metcalf et al. 2007) raised doubts about the genetic purity of Colorado River and Greenback Cutthroat populations being used in recovery programs, and effectively stalled the recovery program for the ESA-listed Greenback subspecies. Then, in 2012, came a publication that makes a case for seven subspecies (two extinct) in the southern Rocky Mountain region historically rather than the four subspecies (one extinct) we have long recognized from Behnke's classification, but with substantially different distributional boundaries, particularly for the Greenback (Metcalf et al. 2012; see also Bestgen et al. 2013). In 2013, the Fish and Wildlife Service convened a panel of taxonomic experts similar to the one being proposed here to examine this latest evidence with a focus on the taxonomic status of just the Colorado subspecies. Although that panel hasn't completed its work, it serves as a model for the much broader Special Workshop we propose here.

These examples illustrate the extent to which lumping (or in the Metcalf et al. [2012] case, splitting) of Cutthroat Trout subspecies has either been proposed or put into practice without regard for recognized taxonomic classification in recent years. Three additional papers, one published in 2009 and the other two in 2012, but each based on sequence comparisons of mtDNA genes, offered revised subspecies classifications of *O. clarkii* (Wilson and Turner 2009; Loxterman and Keeley 2012; Houston et al. 2012).

2015 Meeting—Portland, Oregon

Wilson and Turner's (2009) results support Behnke's original classification in part, but they do group Behnke's Lahontan, Paiute, Humboldt, and Willow-Whitehorse subspecies together as a single Lahontan subspecies, and they do consider the Fine-Spotted Snake River and Yellowstone subspecies to be just one subspecies, the Yellowstone. Loxterman and Keeley (2012) propose an 8-clade classification for the extant subspecies, in which the Coastal, Westslope, Colorado River, Greenback, and Rio Grande subspecies are the same as Behnke's, but, like Wilson and Turner (2009), their Lahontan clade now includes Behnke's Lahontan, Paiute, Humboldt, and Willow-Whitehorse subspecies. But these authors propose two new clades: a Bonneville-Yellowstone clade that includes the majority of Bonneville Cutthroat sampling locations plus all the Yellowstone and Fine-Spotted Snake River Cutthroat locations; and a distinct Great Basin clade that comprises the remainder of the Bonneville locations that did not cluster with the Yellowstones. This



<http://www.westernnativetroutrout.org/content/greenback-cutthroat/>

new Great Basin clade appeared to the authors to be more closely related to the Colorado River clade than to the other Bonneville forms in their Bonneville-Yellowstone clade, but nevertheless they considered it a distinct subspecies (Loxterman and Keeley 2012). The paper by Houston et al. (2012) was focused on discovering diagnostic single nucleotide polymorphisms (SNPs) for each subspecies, but in so doing these authors proposed a 10 subspecies classification for the extant subspecies. Like Behnke, they recognized the Coastal, Westslope, Colorado River, Greenback, and Rio Grande forms as distinct subspecies, and they also recognized the Lahontan of the western basin and Humboldt of the eastern basin as distinct subspecies. But unlike Behnke, they folded the Paiute subspecies into the western basin Lahontan subspecies owing to genetic similarity, and the Willow/Whitehorse form into the Humboldt subspecies as Trotter and Behnke (2008) had done earlier. They also lumped the Fine-Spotted Snake River form together with the Yellowstone as a single Yellowstone subspecies. As for the Bonneville subspecies, they recognized it as a distinct subspecies but split out the Bear River strain, which they set apart as its own distinct subspecies (Houston et al. 2012). The bottom line from these three papers is that each of these newly proposed classifications shows some congruence with Behnke's original classification of *O. clarkii*, but not always the same congruence; and, where they differ from Behnke's classification, they also differ among themselves as to what the new subspecies classification should be. These differences highlight issues that beg resolution in a Special Workshop setting

And finally, we point to a paper published in 2002 that proposed an entirely different evolutionary history and sequence of radiation for the modern cutthroat subspecies—one centered around an inland, Bonneville Basin origin of Cutthroat Trout much earlier in geological time than Behnke had believed, followed by an outward radiation of the various Cutthroat lineages that spanned about the last 4 million years (Smith et al. 2002). The authors of this paper reached their conclusions from their own interpretation of the fossil record coupled with mtDNA analysis



<http://www.westernnativetroutrout.org/content/rio-grande-cutthroat/>

of modern specimens and molecular clock estimates of divergence times based on that analysis. Although this work did not offer a new classification for the species, it did challenge Jordan's basic evolutionary and radiational history assumptions that provided the underpinning for Behnke's classification.

2015 Meeting—Portland, Oregon

These examples highlight issues that have cropped up in recent years regarding the proper biological classification of the Cutthroat Trout species. All could have direct bearing on ESA listings and recovery programs, in addition to their importance for land and aquatic habitat managers, fisheries managers, and scientists engaged in research on cutthroat trout. We submit that these are all issues that should be addressed and resolved by experts in trout taxonomy in face-to-face working sessions, not by operating remotely from one another or by corresponding back and forth via the scientific journals. We believe it is high time that a panel of such experts is convened to critically review all the evidence and, if deemed necessary, come up with a new, agreed-upon classification at the subspecies level for the entire cutthroat trout species. As noted above, the Fish and Wildlife Service convened a panel to consider the taxonomy of the cutthroat trouts of the southern Rocky Mountain region. That panel should be reporting soon, and its findings will be incorporated into the deliberations of this Workshop.

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Potential Panel Members and/or Presenters

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Ted M. Cavender,
Ohio State University (emeritus)
R.F. Stearley
Calvin University
Richard L. Mayden
St. Louis University
Marlis Douglas
University of Illinois
Jeffrey Olsen
U.S. Fish and Wildlife Service
Dennis Shiozawa
Brigham Young University
Andrew R. Whiteley
University of Mass. Amherst
Fred Allendorf
University of Montana
William Eschmeyer
California Academy of Sciences
Sheldon J. McKay
Simon Fraser University

Ruth B. Phillips
Washington State Univ., Vancouver
Gary Thorgaard
Washington State Univ., Pullman
Bob Gresswell
USGS Bozeman
Jennifer Nielsen
USGS Anchorage
Louis Bernatchez
Laval University, Quebec
Peter B. Moyle
University of California Davis
Wade D. Wilson
University of New Mexico
Mary Peacock
University of Nevada Reno
J.L. Metcalf
University of Colorado
Kevin B. Rogers
Colorado Parks and Wildlife
Ernest R. Keeley
Idaho State University
Douglas F. Markle
Oregon State University

D.A. Hendrickson
University of Texas
John G. Lundberg
Academy of Natural Sciences,
Philadelphia
Michael K. Young
U.S. Forest Service, Missoula



Treasurer's Report

Utah American Fisheries Society FY14 Summary
October 1, 2013 – July 2, 2014

Savings Balance	\$ 25.09
Money Market Balance	\$ 1,625.70
Starting Business Checking Balance	\$ 2,949.65
Income	
Meeting Income	
Fundraising	\$ 5,096.35
Registration	\$ 7,611.84
Membership	\$ 1,943.93
Cash return	\$ 152.00
Trap Shoot	\$ 313.51
Interest	\$ 1.74
Sponsorship	\$21,207.74
Rolling Reserve Reimbursement	\$ 675.35
Total Income	\$37,002.46
Expenses	
Meeting Expenses	
USU	\$ 4,226.26
Greenwell	\$16,440.00
Programs	\$ 550.99
Misc	\$ 187.02
Beverages	\$ 820.61
Fundraising	\$ 1,700.32
Membership Reimbursement	\$ 24.31
Continuing Education	\$ 44.42
Awards	\$ 560.80
Cash withdrawal for meeting change	\$ 290.00
Student Subunit payment	\$ 1,320.00
AFS Insurance	\$ 150.00
Checks	\$ 14.99
Business lunches	\$ 35.61
Quicken	\$ 47.85
Travel Reimbursement	\$ 290.00
Total Expenses	\$26,703.18
Ending Business Checking Balance	\$12,247.68
Balance Transfer (to WD Endowment)	\$ 1,000.00
Western Division Total (\$2405 on Nov 30, 2013)	\$ 3,405.60
Net Worth	\$17,304.07



Balance of UTAFS funds in WDAFS Endowment

6/30/14	\$3,664.96
5/31/14	\$3,635.73
4/30/14	\$2,483.05
3/31/14	\$2,516.04
2/28/14	

President's Message

I am excited to be writing both my first and last Lateral Line President's Message. This August I will be transferring into the role of Past President but my hope is that my involvement with AFS will not diminish. The four year commitment to the Executive Committee has been extreme. There have been moments of extreme anxiety and frustration followed by days of extreme burn out. However, this position has afforded countless benefits and opportunities. Most notable has been my involvement and networking with members of the Western Division. Travelling to Mazatlan for the 2014 meeting was amazing and provided the perfect getaway from Utah in April. The symposia held at this meeting were high quality, as always, and I particularly benefitted from attending "Challenges of invasive Northern Pike in the West: threats and management options." While this was one of the most depressing days I've encountered at a meeting, Northern Pike are posing a severe threat in the majority of western states, it was also one of the most informative. Many surrounding states have completed the trial and error phase of controlling Northern Pike populations and have found options that may be effective in Utah waters. Mazatlan meeting abstracts are available online at wdafs.org. Travel to Mazatlan and many other opportunities would not have been possible without my service on the Utah Chapter Executive Committee. If you have not yet served as a Utah Chapter Executive Committee member I encourage you to do so.



I am sure many of you are anxiously awaiting our working copy of the Utah Chapter Procedures Manual. The purpose of this document is to provide Chapter members, especially those serving on a committee, with guidelines and information on how our Chapter functions. A huge effort has already gone into the document, most notably in the development of a Chapter Business Plan. However, this is an extensive document and there is still a lot left to complete. Initially the plan was for a guiding document with several appendices to support information provided within. Example appendices include items such as meeting venue and catering contracts, lists of past committee members and award winners, and sample budgets. The executive committee is currently working on determining how to best handle all the supporting documents as well as finalizing procedures manual content. I can assure you once the field season slows down your Executive Committee members will pick up where we left off with the goal of completing the Procedures Manual long before our next annual meeting.

We have a need for someone to fill a position as Chapter Archivist. The Executive Committee has decided the Chapter should have two people working to preserve Chapter history. After my term as Past President is completed I have offered to continue compiling Chapter history by working with members who have already done a great deal towards this effort. However, this does not cover current Chapter activities that need to be captured. We are looking for someone who has access to decent camera equipment and is willing to photograph and document what's going on for posterity. If this sounds like something you would be interested in, please contact me at jackiewatson@utah.gov.

I would like to remind everyone that Utah Chapter dues can now be paid online with your Society memberships. This process makes it easier for you to maintain your membership and voting status as well as for the Chapter to get credit for your membership. Even if you don't pay your Chapter dues through the Society please be sure to mark that you are both a Utah Chapter and Western Division member so our rebates are accurate..

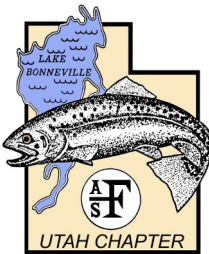
Finally, if you have any ideas, suggestions, comments, questions or concerns please do not hesitate to contact me or any Executive Committee member. This is your Chapter, make sure you are being represented well. Take care and have a great summer!!

Utah State University Subunit

The Utah State University Subunit will be hosting the Western Division American Fisheries Society's 2015 Student Colloquium

This is an annual meeting for students hosted by students. Student colloquium is a great opportunity to present research, receive feedback from your peers, and network with other student subunits.

This event is being planned for Spring 2015, details will be provided as planning continues.



Featured Fisheries Projects

With the revival of our Lateral Line we decided to feature ongoing fisheries projects conducted by Utah Chapter members. In each issue we hope to highlight projects from each student subunit and at least one project from a Utah professional. As the year goes on, please keep your Executive Committee aware of interesting projects occurring in our state. In addition, encourage your colleagues to present their findings at our annual meeting. Many thanks to our first contributors, Lisa Winters, Sunyeong Oh, and Matt McKell!

Featured Fisheries Projects

Curbing the Chub: USU Aquatic Ecologist Works to Restore Balance

By Lisa Winters, Utah State University

How do you stop an exploding population of an unwanted fish, quickly and effectively, without ruining the trout fishery so popular with Utah anglers?

This is the basis of my graduate research work as a member of Utah State University's Fish Ecology Lab. For the past two years, I have made periodic trips to Scofield Reservoir, a 2,815-acre man-made lake on the Price River in the heart of Manti-La Sal National Forest. With guidance from Professor Phaedra Budy, my advisor in the Department of Watershed Sciences, I've spent nearly every daylight hour catching fish, measuring their length and weight, and extracting valuable body parts to determine how fish in the reservoir are performing.

I work with Bear Lake cutthroat trout, rainbow trout, and tiger trout (a brown trout x brook trout hybrid), along with vast numbers of Utah chub. The chub, a minnow species not native to the Colorado River drainage where Scofield is located, is where the problem lies. The introduced fish reproduces often and exhibits exceptionally fast growth. Since the chub's 2005 appearance in the reservoir, anglers have observed a substantial decrease in the rainbow trout fishery as well as an exponential increase in the Utah chub population. Needless to say, the fishermen are not thrilled.

Tasked with managing Utah's fishing opportunities, the Utah Division of Wildlife Resources has worked to mitigate the chub problem with the use of 'biological control agents'. This process involves the use of top predators that consume vast amounts of unwelcome prey. In Scofield Reservoir, the Utah Division of Wildlife Resources has stocked Bear Lake cutthroat trout, a popular native fish of the state, along with tiger trout, a hybrid species known for its fast growth and aggressive nature, as potential biological control agents to curb the chub.

After seven years of efforts, the Utah Division of Wildlife Resources is beginning to see an impact. Working with the agency, I'm trying to determine what and how much the biological control agents are consuming.



At Utah's Scofield Reservoir, USU graduate student Lisa Winters holds a hybrid tiger trout, used as a biological control agent to curb introduced Utah chub populations. The ecologist is working on a study funded by the Utah Division of Wildlife Resources.

Featured Fisheries Projects

With this knowledge, I can simulate the Utah chub consumption potential for each species. My findings show that each individual adult cutthroat or tiger trout may consume 50 chub in a single year. Multiply that by 200,000 of each species in the reservoir, and you can see a lot of Utah chub are being eaten.

Unfortunately, rainbow trout, which once made Scofield a great fishery, have not fared as well. Rainbow trout are not known to be fish-eaters, and, in fact, I've found they consume many of the same aquatic organisms as Utah chub. Thus, the iconic rainbows are disappearing from the lake – they simply can't compete with the voracious chub.



As part of their research, Winters and colleagues use gill nets to capture fish. At Scofield Reservoir, the nets are typically packed with Utah chub.

Our work has broad implications for the many reservoir systems throughout the West. Like Scofield Reservoir, many of these waters have unique and artificial assemblages of fish which make them vulnerable to unwanted invaders capable of altering the species composition. My hope is that, by informing the management decision-making process, I will help find the delicate balance between predators and prey and, for Scofield Reservoir, return it to the thriving blue-ribbon fishery it once was.

Phylogenetic Relationships of Cottids (Pisces: Cottidae) in the Upper Snake River Plain of Idaho

By Sunyeong Oh, Brigham Young University

Five of 64 recognized species of freshwater sculpins (*Cottus*) reside in the Upper Snake River Plain of Southeastern Idaho and Western Wyoming. These five species belong to three phylogenetic lineages, *Cottus beldingii* (including *Cottus leiopomus* and *C. greenei*), *Cottus confusus*, and *Cottus bairdii*. The complex tectonic/hydrological history of this region appears to have favored independent invasions of each lineage. Candidate sources of invasion include the Lahontan Basin, the Columbia River system, the Bonneville-Colorado River Basins and the Upper Missouri River.

The *C. beldingii* lineage appears to have entered the Upper Snake River prior to the isolation of the Lahontan Basin from the Upper Snake River system. It likely dispersed into the Wood River and the Lost River drainages on the northern edge of the Snake River Plain via the Snake River.



Cottus beldingii

Featured Fisheries Projects

C. confusus, found in the Lower and Middle Snake River, is also present in the Lost River streams and appears to have entered through the Salmon River, sometime after the isolation of the Lahontan



Cottus bairdii

Basin. The third lineage, *C. bairdii*, appears to have originated in Atlantic Basin streams and may have invaded the Upper Snake River Plain through stream captures from the Upper Missouri River Basin after isolation of the Lahontan Basin. Both *C. beldingii* and *C. bairdii* may have dispersed into the Bonneville and Colorado River basins more recently.

We have examined mitochondrial DNA and are now validating nuclear DNA markers developed through RNA isolation and cDNA sequencing on a next generation sequencing platform. We anticipate that phylogenetic analyses of DNA sequence data will allow us to determine the actual sources of cottids in the Upper Snake River Plain. We are also examining the phylogenetic associations among cottids in the adjacent Lahontan, Bonneville, Colorado River, Lower Snake River/ Columbia River, and Upper Missouri River basins.

These relationships are critical for testing the hypothesized dispersal patterns.



Cutthroat Trout in the Weber River By Matt McKell, Utah Division of Wildlife Resources

"So there we were..." It was July 2009, in the heat of a typical summer day. We were sampling the lower Weber River for bluehead sucker near the town of Mountain Green. This was pretty much your ordinary, average day of raft electrofishing, including the typical, frantic netting on the front of the raft. Tons of brown trout (for which the Weber is best known), mountain whitefish, some rainbow trout, pods of large Utah suckers, and an occasional bluehead sucker. Then, unexpectedly, our sampling moved beyond the typical.

At the confluence with one of the small tributaries was an unusually large number of cutthroat trout. Totally unexpected, and super cool! But also a little perplexing. The Weber River, as broken up and hammered by dams, diversions, altered habitats, non-native fishes, and all the potentially negative impacts it had been subjected to for many years, still harbored a population of cutthroat trout.

Featured Fisheries Projects

Amazing! But lots of questions...How did they hang on? Did the cutthroat we sampled represent a remnant of the native stock? What were they doing at that tributary? With few answers right then but wanting to explore a little, we decided on the spot to collect some fin clips to look at genetics (...not too surprising, there appeared to be genetic evidence of past stocking of non-native cutthroat trout).

Fast forward a couple years. In 2011, our office began to collaborate with Dr. Phaedra Budy and the Fish Ecology Lab at Utah State University to look at cutthroat trout population dynamics in the lower Weber mainstem and a handful of tributaries. The study included assessments of genetics, movement, spawning, barriers, and fish passage.

Fast forward a few more years to the present. We now have a boatload of data from three field seasons, including genetics results for the tributaries, PIT tag and antenna data for assessing movement of individual fish, information on passage, mainstem abundance estimates, survival estimates, water chemistry for each stream/section and otolith microchemistry for a handful of individuals for assessment of natal origins, and more.

It turns out there is much more to this cutthroat population than we anticipated. It's larger than we originally thought, we've PIT-tagged nearly 2,000 cutthroat trout and still get fairly low recapture rates. There is more movement and tributary use than expected, and we've identified significant spawning tributaries, which are likely the primary reason the fluvial population has persisted. The gene pool in the mainstem may not be as muddled with non-native DNA as previously thought...there are native genes in the Weber River that are very similar to non-native ones, and there is a possibility that some of the alleged non-native genes are actually native. In addition, four of the five tributaries have populations that are genetically pure, even in fluvial spawning areas. The genetics in the mainstem and tributaries look so good that we're managing these fish as a sportfish/conservation population. We even changed fishing regulations in this portion of the Weber River to catch-and-release for cutthroat.



Paul Thompson holding a large fluvial cutthroat trout captured in a small tributary of the Weber River.

Featured Fisheries Projects

There are also fewer complete barriers than we thought, and these cutthroat have exhibited an unbelievable ability to surmount obstacles that we, the smart humans we think we are, identified as full barriers. In fact, one cutthroat trout pit-tagged in 2012 traveled 12 river km upstream from the point of tagging, passing three mainstem "barriers" and a few large beaver dams in a tributary before being detected by the antenna in that tributary this past spring. The data we've collected have already spawned projects aimed at improving passage, some of them recently completed or soon-to-be (two fully funded and in the hopper), plus more in the works. One impassable barrier, a diversion structure at the mouth of Weber Canyon (see photo), was modified with a bypass channel in 2011 and passage



Tributary culvert that dozens of PIT-tagged fluvial cutthroat trout have ascended during spring spawning.



Large diversion at the mouth of Weber Canyon, now fish passable since 2011.

of cutthroat trout and lots of other native fishes has been confirmed via weir trap. This is the first passage of fish through this diversion in nearly a century!

Cutthroat trout are amazing! What an extraordinarily persistent fish, and what a great story they're telling!

2014-2015 Utah Chapter Executive Committee

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