

**Minutes of the AFS Southern Division Trout Committee Meeting
May 15-16, 2017
Wolf Creek National Fish Hatchery, Jamestown, Kentucky**

The 2017 meeting of the American Fisheries Society Trout Committee (Southern Division) was called to order at 08:35 by Tom Whelan (Committee Chair).

With 14 Trout Committee members in attendance, Chair Whelan determined sufficiency of a required quorum of ten voting members.

Dave Dreves introduced and thanked USFWS staff for allowing the Trout Committee to meet at the Wolf Creek National Fish Hatchery. Tom extended his thanks to the Kentucky committee members for organizing the meeting and arranging lodging at nearby Lake Cumberland State Park.

The following members and guests were in attendance on the first day: Dan Rankin (SC), Greg Cummings (TX), Jacob Rash (NC), Stephen Reeser (VA), Justin Heflin (KY), Jim Habera (TN), David Thorne (WV), John Damer (GA), Dave Dreves (KY), Marcy Anderson (KY), John Williams (KY), Christy Graham (AR), Jack Van Deventer (Microfish), Brandon Simcox (TN), Justin Spaulding (TN), James Gray (USFWS) and Tom Whelan (MO).

Old Business

Membership List Update: Chair Whelan passed around the current membership list and asked attendees to review and update the list, as necessary.

New members to the TC include Greg Cummings (TX), Justin Heflin (KY), and Jack Van Deventer (Microfish). Jack has been an active guest for several years and had decided to formally join the TC. Introductions were made and a total of 20 were in attendance for the first day of the meeting.

Approval of the 2016 Meeting Minutes: Chair Whelan apologized for 2016 minutes being ruined in a flood last month and he had to rewrite them last week. Chair Whelan asked if committee members present had the opportunity to review the minutes from the previous year's meeting at Oglebay Resort, Wheeling, West Virginia. During a discussion it was determined that members did not have sufficient time to review the minutes. John Damer suggested waiting a week for members to review the 2016 minutes, then electronically approve the minutes through email. Chair Whelan agreed and delayed the approval of the 2016 minutes.

Treasurer's Report: Treasurer Christy Graham (AR) reported on the Committee's financial status as of May 14, 2017. The balance was \$4,078.16. There were several expenses in the last year. The committee purchased flowers in memory of Tim King, travel reimbursement expense, sponsored the Kansas City AFS meeting. Christy deposited an anonymous check for \$1,000 today and brought the balance up to \$5,078.16. Christy received a thank you card from the Martinsburg Little League in honor of Tim King.

During the last year, two members had passed away Spence Turner (MO) and Tim King (USGS). Chair Whelan opened up a discussion that continued the 2016 discussion on an honorarium. The committee discussed what should the qualifications be and how does it differ from the existing

Distinguished Service Award. The TC did not determine a dollar amount for the possible honorarium in 2016, but \$200 was spent on a donation for Tim King and flowers. Christy was not sure how honorarium donations might affect line item deductions for tax purposes. Jim Habera suggested the Executive Committee can make a decision on the possibility of an honorarium. The committee is always open to recommendations for folks who need to be recognized.

Tom Whalen made a motion to approve the treasurer's report and John Damer seconded. Motioned passed.

Trout Committee Website Update: Jim Habera gave a brief update on the Committee's website. The committee can either pay AFS \$250 annually (with a \$350 startup) to migrate the old site over or we can privately host our own website. Chair Whelan said the TC will still have the ability to update the website as needed. Christy said that occasional income should keep the budget stable and this years' expenses were above normal. The option of privately hosting a website would cost about the same as using the AFS rollover option. After a discussion, the committee determined it would be cost-effective and easier to use the SDAFS hosting service.

The TC's only income is from donations and the occasional registration fee from East Coast Trout Management and Culture workshop/meetings. It is still worth seeing if it is possible to split the costs with other committees.

Tom Whalen made a motion to go with SDAFS website migration. David Thorne Seconded. Motion approved.

New Business

MICROFISH Update: Jack Van Deventer updated the Committee on the status of the latest version of MICROFISH software package. As of yesterday, program is ready to go except a few minor issues Matt Kulp pointed out recently when testing the software. The new version is MICROFISH 4.0, based in Excel, and Jack has put over 3,000 hours of work into this version. Started writing in Microfish for DOS in 1985. The 2001 trout committee asked for a Windows based version and it is now in 60 countries, including Madagascar.

The latest version has data validation as entering data. Matt Kulp pointed out that there is a need to adjust GPS input to account for projections. Also, there will be an option to use zipcode to infer financial value to adjacent communities.

There are three components that fisheries biologists can take advantage of: 1. the fisheries data entry facility, 2. dash boarding and reporting, and 3. fisheries functions in Excel. The new version of MICROFISH will accommodate all fisheries sampling types and strategies. The latest version is modifiable and expandable.

Jack detailed the data warehousing process and entry. Microfish 4.0 has slicers for the charts to select which ones you want to see rather than automatically populating thousands of figures. Still only has Microfish MLE, intends to add mark-recapture, and economics data. Using data cubes, it is possible to compare data over time and space.

Jack gave a real-time demonstration of data validation and analyzing the data. Microfish has been free for 30 years but he needs to charge and the price will be \$180 and discount for Trout Committee members at \$90. There will also be a bulk discount. Committee discount ends in August 2017 then will go back to full price. The Microfish website is on hold but should be live in several weeks for online payments. Jake Rash asked about an agency license option and the option of integrating into a central database. Jack felt confident he could compete with other programmers.

Nomination and Election of New Trout Committee Officers: Chair-elect Justin Spaulding (TN) will become the new Chair following the meeting. Stephen Reeser made a motion to nominate Matt Sells (MD) as the new Chair-elect and was seconded by Jake Rash. The motion was approved unanimously. Christy Graham will remain as Treasurer.

Christy offered to host Arkansas for the 2018 meeting. The committee discussed the possibility of overlapping the 2019 TC meeting with the East Coast Trout Management and Culture Workshop—that is overdue. The committee agreed to continue hosting the meeting in mid-May.

Northeastern Trout Administrator group may have some connections to wrangle people for a 2019 EBTJV meeting. Stephen Reeser will talk to folks in New England to see if there is interest and report back to the committee. Jake Rash will approach the SDAFS aquaculture committee to scope for interest. The committee will try to get the EBTJV back on a five year rotation.

Tom Whalen motioned to have the meeting in 2018 in Arkansas. Dave Dreves seconded. Motion approved.

Regional Biosecurity Issues: Chair Whalen introduced Jacob Rash to give his biosecurity talk to introduce the topic.

North Carolina (Jacob Rash)

Salmincola spp.

Since September 2014, NCWRC biologists have documented new biological threats to salmonids within the State. Gill lice (Copepoda: Lernaepodidae: *Salmincola*) have been found on Brook Trout and Rainbow Trout populations. Elsewhere within the United States, *S. edwardsii* and *S. californiensis* are known to parasitize salmonids of the genera of *Salvelinus* and *Oncorhynchus*, respectively. Taxonomic and molecular analyses of copepods confirmed the identification of both species in the State. In addition, anglers have been asked to report observations of gill lice during recreational outings, while the NCWRC will continue to sample Brook Trout and Rainbow Trout populations across the mountains of North Carolina to document the distribution and status of gill lice.

Whirling Disease

On July 27, 2015, whirling disease was confirmed in Rainbow Trout collected from Watauga River – the first occurrence of the disease in North Carolina. Subsequent testing has identified the disease within Elk River. In addition, the NCWRC collected *Tubifex tubifex* (the worm host of the parasite) from its Delayed Harvest Trout Waters to test for the presence of *Myxobolus cerebralis* (the parasite that causes whirling disease); *T. tubifex* from Mill Creek and Watauga River were found to be positive. In addition, infected *T. tubifex* were collected above the NCWRC's Marion State Fish Hatchery. Currently, this facility is under renovation and biosecurity measures have been incorporated into the facility design. Trout have also been tested from NCWRC's trout production facilities – all were found to be negative. The NCWRC initiated testing of self-sustaining wild trout populations in spring 2016 for the presence of *Myxobolus cerebralis* and whirling disease. This effort focused on collecting representative samples across a wide spatial extent, which examined approximately 1,500 trout from 36 localities. Four collections from three major river basins (Yadkin River, French Broad River, and Watauga River) were infected with *Myxobolus cerebralis*: Rainbow Trout from Roaring Creek; Brown Trout from South Toe River, Laurel Creek, and Boone Fork; and Brook Trout from Laurel Creek. The NCWRC will continue to work with researchers from Auburn University to explore the distribution and life history characteristics of *Myxobolus cerebralis* in North Carolina.

Didymo

Researchers from Tennessee Tech University collected cells of the microscopic algae in Tuckasegee River while conducting regional surveys in late 2015 – the first time the organism has been documented in North Carolina. Additional research is needed to determine its prevalence in Tuckasegee River and throughout the State

Missouri (Tom Whalen)

Missouri hatcheries all have had biosecurity plans in place since 2010 to help prevent the spread of disease and invasive species within Missouri. The plans were updated again in 2014. The main objectives of the plans are to identify activities that may spread invasive species and disease, provide isolation areas at each facility (when possible), give guidelines on how disinfection of equipment is to be done, provide guidance on dealing with sick fish, and establish protocols to follow when transferring fish between hatchery facilities within the state.

In 2016, Parvo was detected at the hatchery but it turned out to be a contaminated bacterium in the sample that mimics Parvo.

Maramec Hatchery staff has concluded a study using brown trout as a biological filter for parasitic copepods. Brown trout seem to have the same ability as brook trout to interrupt the life cycle of this parasite. The advantage of using brown trout over brook is brown trout can be utilized and stocked in waters of the state.

South Carolina (Dan Rankin)

South Carolina has a single cold water hatchery and have not tested positive for gill lice or whirling disease. There are very few private trout facilities and the ones there are receive live trout from North Carolina in order to grow them out. The SCDNR regulates private hatcheries but there is a loop-hole if the fish are purchased out of state.

Texas (Greg Cummings)

Texas purchases Rainbow Trout from Missouri and Brown Trout from Nebraska. Their big ANS threats are the zebra mussel, golden alga, pathogens, and aquatic plants, monitoring of hatcheries and public waterbodies, fish-hauling units sterilized after each stocking, quality assurance and control for procedures, training for hatchery staff, annual disease and ANS inspection certification required for each fish source, a new Aquatic Invasive Species group monitors waterbodies, performs some treatment actions, and runs awareness campaign

North Carolina (Jake Rash)

In addition to the previous presentation, recent efforts have focused on identifying watershed supply for the Forest Service for emergency fire suppression.

Virginia (Stephen Reeser)

Virginia has five coldwater hatcheries. No new watersheds are stocked. VDGIF has adopted an internal biosecurity plan for our five coldwater facilities, and we are actively working toward AFS Bluebook Certification for all of our coldwater hatcheries and culture stations. Also, they are working with the agency veterinarian and department of agriculture to set up biosecurity programs.

Tennessee (Jim Habera and Brandon Simcox)

Agency personnel sampled tailwater rainbow and brown trout for whirling disease. Whirling Disease has not been detected in TN hatcheries, yet. Virkon has been distributed to all hatcheries and they're working with local high schools to maintain cleaning stations. Tennessee Tech is trying to determine if Didymo is native to Tennessee looking at preserved fish stomach content from 30 years ago.

West Virginia (David Thorne)

Twenty years ago it was detected once in a private facility. There are occasional and seasonal observations of gill lice in brook trout. They consider Didymo to be native and regularly see self-regulated blooms. Department hatcheries have implemented biosecurity protocols.

Georgia: (John Damer)

Previous procedure was lackadaisical. After the North Carolina outbreak, Georgia started testing its public hatcheries and streams. There are two permitted trout facilities and they have been tested as well. Gill lice have not been detected in wild populations. All staff members now complete biosecurity training at Warm Springs and field crews now disinfect their gear. Georgia has no known cases of Didymo. Across the southeast, most folks are now using Virkon as a disinfectant.

Kentucky (Justin Heflin)

The Forest Service asked KDFWR staff to rank waters for fire suppression so they can put together a list for their water haulers (trucks and helicopters). This will be a list of ranked streams and lakes that they should pull water from and those that they should avoid if at all possible.

Wolf Creek NFH raises all cold water species. There are no written warm water hatchery protocols and guidelines are in the early phases, however steps are taken to avoid translocation of exotic species when there is a specific known risk.

Didymo was first detected in Kentucky in the Cumberland tailwater but has not been seen there in nearly ten years. Didymo has been observed in recent years in the Laurel River Lake tailwater, but need confirmation whether it is still present.

Arkansas (Christy Graham)

The Arkansas Game and Fish Commission recently hired a full time ANS coordinator who is developing an ANS database for AGFC. The Fisheries Division also has a pathologist who conducts routine checks for pathogens in the hatcheries and the agency recently hired a veterinarian to be part of the new AGFC Research division. Flooding in Spring 2017 has been a setback for trying to eliminate IPN from the Spring River Fish Hatchery, as all fish from quarantined areas were mixed with decontaminated areas. Although unfortunate, fewer fish on site means Spring River staff will have time to better assess potential changes to the hatchery's aging steel fish production silos. The AGFC will now be looking to develop a renovation plan and construct fish production units that better address biosecurity issues and prevent flood losses in the future. The decrease in production also means the hatchery will have the space to increase the average size Rainbow Trout stocked in Arkansas from 11 to 12 inches. The TMP has recently started monitoring for zebra mussels in Bull Shoals TW (since they are present in Bull Shoals Lake), and didymo continues to be found in most all Arkansas trout waters.

Wolf Creek National Fish Hatchery (James Gray)

James stressed the importance to educate private growers since they may not have a biology degree and understand the importance of biosecurity. Decades of stocking without biosecurity protocols have likely introduced Didymo all over the area.

Jacob Rash will try to keep the ball rolling on the EBTJV and coordinating to develop a regional biosecurity protocol or guideline. No actionable decisions were made at this time.

Tom Whalen dismissed for lunch at 11:55 am.

Immediately after lunch, James Gray gave a tour of Wolf Creek National Fishery. The tour started with a power presentation detailing the history of the federal hatchery program and Wolf Creek.

Local Presentations:

Dave Dreves (KDFWR) gave a presentation on the state's FILO (fees in lieu of) program and how it is used to fund restoration projects.

George Athanasakes, Hatchery Creek engineer, gave a talk on the design portion of the project. Hatchery Creek was a mitigation project that diverts the Wolf Creek hatchery effluent through a 6,060 feet meandering wetland/stream instead of directly into the Cumberland River. The project was collaboration between the Army Corp of Engineers, USFWS, KDFWR, and Division of Water. The project was conducted in order to spend mitigation credits. This was a unique project from an engineering stand point that won't quickly be replicated. Most notably, there were high water inflows relative to the drainage area because of the tailwater and very little sediment loads. The project was designed to account for all of the life stages of trout. The project was completed in November 2015 and opened to the public in May 2016.

Brad Redmon EcoGro/Ridgewater Redmon Fly Fishing gave a talk on the technical aspects of construction. Brad spends most of weekends fishing Hatchery Creek. Every boulder and stump of hatchery creek was intentionally placed in its exact position. Fish quickly moved into the creek and big trout are abundant. Along the creek there are engineered habitats for large adults: lunger bunkers, hog troughs, boulder jams, and lumber yards.

Patrick Vrablik (Murray State) gave a presentation on biomonitoring of Hatchery Creek comparing the old and new channels. The goals are to support trout, observe redd formation, macroinvertebrate community improvements, and an overall better experience for anglers. Samples started in 2013 and will continue into 2018. The project is looking to see how improvements in water quality and habitat will affect the stream's biology. On a weekend, there are typically over 40 anglers present at any given time.

The committee then took a tour of Wolf Creek National Fish Hatchery and Hatchery Creek to finish the day.

Miscellaneous Items:

Jim Habera has the proceedings of the Trout Committee that documents the history back to the Wildlife Society in the 1960s. This year is the 50th annual meeting of the TC.

Roundtable Discussion

Missouri (Tom Whelan)

April 2017 Flooding: Record flooding was experienced throughout the southern portion of the state this past April. Of the five coldwater hatcheries, Montauk Hatchery was impacted the most. Hatchery staff is currently work through the process of recovering, grading and inventorying fish to determine how many fish were lost due to escape and delayed mortality. Once this is determined, it will be decided if stocking rates will need to be adjusted for the rest of calendar year 2017.

Wader Wash Stations at Trout Parks: Wader wash stations are still in use at the four trout parks and at the Lake Taneycomo tail water fishery. The greatest benefit seems to be as an educational tool to inform anglers about Didymo and the possible impacts it could have to our coldwater fisheries. There still have been no confirmed cases of Didymo in Missouri. Missouri also uses the campaign of “Check, Clean and Dry” to remind anglers of the importance of equipment maintenance when fishing Missouri’s varied coldwater fishing opportunities.

Eleven Point River strain evaluation: The Erwin fish lake strain performed the best of the four strains being evaluated. It is currently the only strain being stocked in the Eleven Point Blue Ribbon Management Area and will continued to be evaluated in the future.

A “Plan for Missouri Trout Fishing” update: Missouri’s plan for trout fishing is now 11 years old, and was update this past year. The purpose of the plan is to provide anglers with diverse, quality trout fishing opportunities consistent with overall sound management of our state’s aquatic life.

South Carolina (Dan Rankin)

South Carolina had a major problem at Walhalla State Fish Hatchery when the oxygen supplier was late and 40,000 catchable trout died. An additional 20,000 trout died from Columnaris. Georgia has assisted with border water stockings to alleviate lack of supply.

Brook Trout genetics work was conducted using the micro-satellite methodology. This was a cooperative study between SCDNR, Clemson University (Dr. Yoichiro Kanno), University of Mass-Amherst (Dr. Andrew Whiteley). The study was funded by DNR, Duke Energy, USFS, and TU. Preliminary results from 18 wild brook trout patches indicate 12 pure native streams, with the other 6 showing signs on introgression by northern (hatchery) strain brook trout. Dr. Yochiro Kanno is leading efforts to publish our findings.

SCDNR has conducted brook trout restoration and/or habitat enhancement efforts in ten streams totaling approximately 27 miles in recent years. This has included: 1) Antimycin application to remove non-native trout in three streams (~10.5 miles) followed by habitat enhancement, 2) enhancement of habitat in existing wild populations (two streams, ~6.5 miles), and 3) habitat enhancement followed by translocation of brook trout in 5 streams (~10 miles). The primary habitat enhancement technique used has been “chop-and-drop” addition of large wood. Our BVET habitat assessment studies indicate chop-drop large wood additions result in increased pool habitat and cleaner (gravel) substrate in “fast water” habitat units.

The Department has shifted statewide trout creel from hodgepodge of bag limits to five fish statewide, except on Jocassee where the creel limit is three. The creel limit cut resulted in some harvest-oriented

anglers complaining and calling for larger fish. We are working to increase the average size of trout stocked in our hatchery-supported waters. Lake Jocassee trout population numbers are down. Possible link to increases in spotted bass abundance. Also, there has been an increased mortality of females after spawning run. Triploid fish might have faster growth and will not be spending energy on reproduction. A stock assessment comparing growth and survival of triploid and diploid brown trout is ongoing. Preliminary results are mixed.

SC DNR Biologists in Region 3 are finalizing a study on growth and survival of trout in the Lower Saluda Tailwater near Columbia. The study included a creel survey. <http://dnr.sc.gov/troutstudy/index.html>

Texas (Greg Cummings)

Community Fishing Lakes – impoundments less than 75 acres, over 150 CFLs, approx. 60 stocked with trout, include city/county/state parks, Channel Catfish in summer, Rainbow Trout in winter

- Neighborhood Fishing Program – 18 locations in 11 urban areas of TX, more sites planned, put-and-take, CCF in summer, RBT in winter, stocked every two weeks
- 3 tailrace fisheries – Most popular is Canyon Reservoir Tailrace, Guadalupe River, 10 stockings during winter/spring at 5 sites, TPWD stocks over 18,000 per year, Guadalupe River Trout Unlimited stocks 8 to 10 thousand per year,
- Canyon Reservoir Tailrace – approx. 10 miles, most years trout have oversummer survival, high rainfall causes reservoir to de-stratify and increases temp at outflow, Brown Trout stocked to see if survival better, management actions include temperature monitoring, special regulation zones, creel surveys, and minimum flow agreement

North Carolina Wildlife Resources Commission
Update to the Southern Division of the American Fisheries Society Trout Committee
2017 Annual Meeting
Lake Cumberland State Park, Kentucky
15 – 17 May 2017
Report submitted by Jake Rash

Recent Socioeconomic Evaluations

The NCWRC worked with Responsive Management to collect information from resident and nonresident license holders that fished for trout in North Carolina during 2014. Data generated from these studies described angler preferences and expectations for trout fisheries management, while estimating the total economic impact and contribution of trout fishing to North Carolina's economy. In addition, Responsive Management contacted landowners to collect data concerning their views toward the NCWRC's Public Mountain Trout Waters program and angler access. Summaries and full reports of the three studies are available from the NCWRC.

Trout Distribution

The NCWRC continues its efforts to document the distribution of North Carolina's wild Brook Trout, Brown Trout, and Rainbow Trout populations. To date, over 700 Brook Trout populations have been identified. The NCWRC continues sampling efforts to identify new populations and evaluate assemblages associated with legacy data. In 2017, the NCWRC will have a two-person crew focused on these collection efforts.

Brook Trout Genetics

The NCWRC has been collecting genetic information for the State's Brook Trout in conjunction with trout distribution efforts. Recently, the U.S. Geological Survey genotyped 7,588 Brook Trout representing 406 collections from across North Carolina at 12 microsatellite loci. Results of this effort found genetic diversity within populations to be low and that little, if any, gene flow occurs among populations. In addition, the majority of populations show limited evidence of introgression by northern origin hatchery strains. These results represent a valuable baseline for management and restoration efforts of Brook Trout in North Carolina.

Brook Trout Restoration

The NCWRC has used recent genetic data to plan Brook Trout restoration activities. Currently, three reintroductions are planned for 2018 via the translocation of fish from selected source populations.

NCWRC Trout Page

The NCWRC continues to update its trout webpage to provide pertinent information concerning its trout management program in one place to help facilitate information exchange. The page can be found at www.ncwildlife.org/trout. Recently, information concerning [Stream Flow Conditions](#), [Aquatic Organism Passage](#), and [Trout Handling Advice](#) were posted.

Eastern Brook Trout Joint Venture

NCWRC has continued to be actively involved with the Eastern Brook Trout Joint Venture (EBTJV). Doug Besler completed his term as Chair of the EBTJV Steering Committee. Jake Rash serves as North Carolina's State Representative on the Steering Committee and as a member of the Science and Data Subcommittee.

Long-term Trout Monitoring

In 2012, the NCWRC initiated efforts to obtain routine data on wild trout populations. Initial long-term monitoring efforts were completed in 1996; however, recent data are desired to gain a greater understanding of wild trout population dynamics in waters managed by the NCWRC. Clemson University is working with the NCWRC to evaluate population dynamics and future monitoring strategies. As appropriate, the NCWRC will continue to seek to partner with fellow resource agencies to develop more robust data sets.

Persistence and Movement of Stocked Trout

The NCWRC is worked with North Carolina State University to investigate the persistence and movement of stocked trout. NCWRC manages approximately 1,000 miles of lotic resources via intensive, seasonal stockings of catchable-size trout. Anglers and managers perceive that catch rates significantly decline through time following a stocking event. This trend is expected in Hatchery Supported Trout Waters, where harvest is encouraged; however, declining catch rates are also observed in Delayed Harvest Waters during the period when harvest is not permitted. The NCSU study found that emigration from reaches was associated with stocking and high-flow events. In addition, emigration was responsible for a greater loss of trout than mortality in all rivers evaluated. The NCWRC will utilize this information to help inform its management of stocked trout.

Contribution of Stocked Brown Trout and Rainbow Trout in Apalachia Reservoir

Located in the far western portion of North Carolina, Apalachia Reservoir has suitable trout habitat year-round and a clupeid forage base. Thus, the impoundment is a candidate for put-grow-and-take trout stockings and has the potential to produce large fish. In 2017, the NCWRC will conclude its evaluation of the best size and species of trout for put-grow-and-take stockings in the impoundment. Additional information about this project can be found within the March-April 2015 issue of *Wildlife in North Carolina*.

Evaluation of Advanced Fingerling Brown Trout Stockings in Bridgewater Tailrace

The NCWRC has worked to establish a put-grow-and-take Brown Trout fishery in Bridgewater Tailrace since 1995. These efforts have been successful in establishing a fishery; however, recent NCWRC surveys and angler reports indicate that success has been intermittent. Long-term water quality data suggested that thermal bottlenecks in the system may limit trout survival. In 2016, the NCWRC completed a five-year evaluation of a new management approach focused on stocking approximately 10,000 advanced Brown Trout fingerlings (200–255 mm total length) following the period of a potential thermal bottleneck. Study results indicated fast growth and a fishery comprised primarily of age-1 trout. Potential alterations to the management approach will be considered to enhance the fishery.

Winter Stockings of Trout in Selected Small Impoundments

In November 2016, the NCWRC stocked selected small impoundments in the mountain region with trout. Community collaborators and the NCWRC have had long-standing partnerships to provide angling opportunities in these waters, which have focused primarily on channel catfish stockings in warmer months. Given the success of those efforts, the NCWRC has been interested in expanding seasonal angling opportunities in these waters by stocking trout when waters cooled. Such stockings have been (and remain) dependent upon the availability of trout beyond the numbers needed to stock traditional stocked-trout resources (e.g., Delayed Harvest Trout Waters and Hatchery Supported Trout Waters). Given the availability of trout and the interest in enhancing these resources, winter 2016 was an excellent time to tryout trout stockings in these impoundments.

Virginia (Stephen Reeser)

The hatchery trout management plan was completed in 2016 that was contracted through Virginia Tech and took 3 years to complete. The Wild Trout plan is on the back burner. These management plans are unique in that they have a stakeholder advisory committee.

Also, new youth only trout waters during April-June have been established to increase recruitment. He is trying to assess utilization with game cameras. The jury is still out whether these programs attract new anglers but they receive positive feedback from public.

Virginia is also looking at pre-announced stocking vs. day of stocking. Opening day back in the 1980s had 5x more pressure. There is a request from some anglers to bring back the opening day. However, there is not a majority amongst the anglers, they are split into thirds.

All five hatcheries have received Biosecurity: Bluebook certification. Stephen would like to aim for 100% triploidy in stocked fish. The Department now has a pressure chamber. Currently, they are about 50% triploid.

Steelhead introduction in Lake Moomaw are being tried. Staff is experimenting with stocking rates and timing.

This summer, the VDGIF will reassess license structure for trout and nonresident anglers. The VDGIF is also working with GIS and social media to let anglers more easily find places to fish.

Concerning wild trout, habitat restoration improving scores but not detectable in the fish. Natural population variability has been confounding results. Stephen is also looking at genetic diversity and effective population size. Acid deposition long term monitoring continues looking at bug and fish data. This is an important part of the EBTJV and Chesapeake Bay recovery. Stephen currently has 50 temperature loggers out.

Kentucky (Justin Heflin and Dave Dreves)

Kentucky is in the last year of a three year project stocking Brook Trout in Parched Corn Creek. This stream was initially stocked by a private individual on public land many years ago. Staff will use a trail camera study on single point access to assess fishing pressure.

Kentucky is moving towards a statewide regulation for Brown Trout at 16", 1 fish. Currently statewide regulation for Rainbows and Browns is aggregate limit, but the new regulation will split Rainbows to 8 fish, no size.

Kentucky has 43 urban fishing lakes where about 118,000 trout are stocked annually. Kentucky intends to increase average size to 10" from 9" with a reduction in numbers.

KDFWR will adjust the Cumberland Tailwater trout stockings to include some enhanced size fish. Wolf Creek National Fish Hatchery will produce 6,500 15" Rainbow Trout and 3,000 12" Brown Trout for fall stocking beginning in 2017. Water quality is back to normal, but have not had any dry years since the dam rehabilitation completion. Dry years favor better retention of colder water and higher dissolved oxygen in hypolimnion of Lake Cumberland. The tailwater may just need a few good years of water quality to restore population to its pre dam rehab levels. A previous stocking of enhanced size rainbow trout in 2013 showed up in electrofishing and creel data. Currently, KDFWR stocks about 161k rainbow and 38k brown for 75 miles of trout water; these numbers will go down in exchange for bigger fish. The enhanced size stockings will be reassessed after a few years to see if population structure is improved and possibly warrants a return to stocking higher numbers of catchable size fish.

Tennessee (Jim Habera and Brandon Simcox)

1. Wild Trout:

- *Brook trout DNA sampling*: DNA samples (n=1,248) from 51 brook trout populations were collected in 2016. These will be analyzed using microsatellite DNA markers (at USGS lab in WV) to update TN's allozyme-based genetics information. Forty-one populations remain to be sampled in 2017 and fish will also be examined for gill lice. A wild brook trout population was verified in a 3-acre pond (at ~4,000') in Unicoi Co.
- *Brook trout restoration / enhancement projects*: Projects to restore brook trout in Stony Creek (Carter Co.) and enhance them in Little Jacob Creek (Sullivan Co.) will be evaluated in 2017. A cooperative project with NCWRC to establish native brook trout in a stream in the Nolichucky basin in TN (Phillips Hollow) may proceed if fish from the donor stream in NC are disease-free. Another project to restore native brook trout in the French Broad basin (Little Paint Creek) may also proceed pending microsatellite DNA results for the prospective donor streams (and if time permits). All four project streams are on the Cherokee National Forest.

2. Tailwaters:

- *Boone drawdown*: The Boone Lake was drawn down (10' below winter pool; 30' below summer pool) continued through 2016 and may extend into 2022. The drawdown is to facilitate TVA's work to eliminate leakage associated with the earthen part of the dam. TVA is continuously monitoring water temperature, DO, and several other parameters in the tailwater. There were some DO depressions into the 4 and 5 mg/l range in 2016, but no apparent effects on the trout fishery based on the 2017 monitoring efforts.
- *Angler use surveys*: Creel surveys are underway on the Norris (Clinch River) and South Holston tailwaters.
- *Didymo*: Dr. Justin Murdock (TTU) is continuing to study *Didymo* in TN waters and is now looking at some historic (1980s and 1990s) fish and benthic macroinvertebrate samples from the Wilbur (Watauga River) and South Holston tailwaters to see if *Didymo* can be identified. If so, it may help determine its status as an invasive or native diatom in TN.
- *Whirling disease screening*: Rainbow (n=60) and brown trout (n=20) samples from the Wilbur (Watauga River) and South Holston tailwaters were collected in March 2017 for WD screening. Results are not yet available. There are no plans yet to screen wild trout from smaller streams, but will be alert for (and asking anglers to report sightings of) potentially affected fish (e.g., with cranial deformities).

3. Regulations:

Delayed Harvest (DH) areas: Proposing to add DH regulations on two trout streams in Region 4 (east TN)—Buffalo Creek (Grainger Co.) on the Buffalo Springs WMA (spring stocking program) and Doe River (Carter Co.) in Roan Mountain State Park. These would be in effect from Oct. 1 (Buffalo Creek) or Nov. 1 (Doe River) through the last day of February and would require the use of artificial lures.

4. Statewide Trout

- Statewide Trout Management Plan (2017-2027)*: Draft plan is ready for public review and comment. A Southern Appalachian brook trout (SABT) management plan is included.
- Crews are conducting a game camera study in middle Tennessee to work on estimating fishing pressure.
- Trout Unlimited funded a HDS survey on Caney Fork River to establish baseline habitat
- Tellico drought. 70,000 trout moved to Dale Hollow
- Gatlinburg Hatchery fire destroyed infrastructure that may require years to repair. In the meantime, the City of Gatlinburg will have to find alternative means to supply trout.

West Virginia (David Thorne)

By David Thorne, Coldwater Fisheries Biologist and Aquatic Habitat Biologist, West Virginia Division of Natural Resources.

- Long-time iconic retired West Virginia Coldwater Fisheries Biologist and Assistant Chief Don Phares passed away unexpectedly on May 6.
- Continuing to work to better understand the historic and current range of native Brook Trout range with surveys, genetics, and temperature monitoring to aid in regulatory and permitting needs as well as assessment and restoration of critical fringe populations.
- Working with West Virginia University Aquaculture program to update a facility at the Reymann Farm center near Wardensville to initiate a hatching and rearing facility for Brook Trout genotypes native to the Chesapeake Bay watershed. A pilot feasibility study is planned for the fall 2017 spawning period.
- A statewide Aquatic Habitat initiative has been elevated to program status to address the needs for restoration and enhancement of quality fisheries habitat. To date, the WV Division of Natural Resources activities have focused on small impoundments and native Brook Trout streams. Approximately 4 miles of Mill Creek in Kumbrabow State Forest (WV's only "intact" Ohio River basin native Brook Trout watershed from EBTJV 2005 assessment) has been improved dramatically with large wood additions. Shavers Fork has had over four miles of instream work to narrow and deepen the channel to deal with elevated summer temperatures. In addition, three significant tributaries have been reconnected to the mainstem, providing additional access to spawning for mainstem Brook Trout. Future planned projects include a one mile reach of Laurel Fork within Holly River State Park for large wood additions to benefit native Brook Trout and angling access.
- Our acidified streams program continues to grow as we work with partners to find new access points to apply limestone sand for neutralizing the effects of acidic precipitation. Approximately 300 miles of direct measured benefit to native Brook Trout streams from treating about 60 state waters is the current extent of our program. The Department of Environmental Protection Abandoned Mine Lands program manages additional waters impaired by acid mine drainage with crushed limestone sand.
- We continue to look for ways to improve Brook Trout size and population structure, considering adjustments to size and harvest limits in some waters. Research in Kumbrabow State Forest over

the coming years may give us additional insight into managing more effectively for larger individual Brook Trout. We are considering adding more Delayed Harvest waters in non-traditional trout waters to extend the season and opportunities for anglers.

- We have recently acquired access to additional trout waters. Spring Run Fly Fishing Only area is a one mile reach of stream downstream of one of our hatchery operations. It has been privately managed for FFO for over 50 years and the aging owners wanted it to be in the public trust. We will continue the management of the fishery and habitat as necessary to maintain the high quality native Brook Trout and wild Rainbow Trout fishery there. Beaver Creek along US48 (Appalachian Corridor H) is in easement with WV Department of Highways and we will work with them to improve water quality (acid mine drainage from legacy coal mining) issues and instream habitat to provide a highly accessible trout fishery adjacent to a major highway. Access points have been created and signage for public fishing has been discussed.
- Hatchery production is at maximum capacity, but new administration would like to see us increase capacity by approximately 20% (to 1 million pounds). Hatchery staff are working to increase number of triploids raised and to reinstate the rearing of tiger trout for put-and-take stocking program.
- We are currently amidst a \$20 million capital improvements project to renovate our hatcheries to maintain current production. Additional capacity will require additional investments in infrastructure.
- Listing of two crayfish as endangered and threatened in our southern coalfields area has necessitated some adjustments to our stocking regime in several streams. Brown Trout will no longer be stocked in waters considered critical habitat for the Big Sandy Crayfish and the Guyandotte Crayfish. Brown Trout have been shown to be predatory upon crayfish in numerous studies. Rainbow Trout have had little data published about their predation upon crayfish so we found a nearby stream with holdover Rainbow Trout and a common native crayfish to conduct a quick diet study. The Rainbow Trout had barely detectable amounts of crayfish among their stomach contents. Brown Trout and native Smallmouth Bass in the same stream both had measurably higher occurrence of crayfish in diet contents. US Fish and Wildlife Service concurred with our request to continue stocking over the listed crayfish as long as only Rainbow Trout were used. Local anglers are pleased with the outcome of the cooperation.
- Continued research into the decline of the Candy Darter by hybridization with the introduced Variegated Darter indicates that there may be two distinct species of Candy Darter. If they are split into two species, at least one may be eligible for emergency listing as endangered or threatened. This may dramatically impact our ability to stock trout in many traditional trout waters. We monitor this discussion continuously.
- Two major natural gas pipelines are slated to cross our traditional trout range. Impacts to native Brook Trout streams are inevitable and plans for dealing with mitigation are currently under discussion within State and Federal agencies as well as pipeline developers. Windfall mitigation dollars are possible to the DNR, but getting that money onto the ground for conservation projects presents some difficulties in the current political climate.
- We have some streams in our non-traditional trout counties of the southern coalfields that are achieving some notoriety among regional anglers. Cold and rich mine discharge from alkaline coal

seams produce spring creek-like conditions in some of the most unlikely-looking places. But big Brown and Rainbow Trout are thriving and giving anglers great opportunities. There is a rising local constituency that is seizing the opportunity to use this resource as a means for an economic boost. Our agency is supporting the resource as much as we can, but patchwork land ownership makes it difficult to work toward access easements and management areas. Locals and Trout Unlimited members are working to create a better public resource.

- I am still hopeful to find a remnant population of “Southern Strain” native Brook Trout in southern West Virginia. We are going to do some eDNA sampling in the Camp Creek watershed (Camp Creek State Forest) later this summer or fall to establish presence or absence of Brook Trout in the watershed so we may more accurately target some areas with intensive sampling.
- We have initiated a planning process for a comprehensive statewide Trout Management Plan. WV has never had a comprehensive plan document, and the only publication I can find that is called a Trout Management Plan dates from 1978. We like Virginia’s Stocked Trout Plan and intend to mimic some of their framework for our own process.
- WVDNR has entered into new cooperative research agreements with West Virginia University Division of Forestry for fisheries and game management research. We have also have a new agreement for habitat restoration and enhancement research and applications with WVU Natural Resource Analysis Center. Ideally, the Center will provide professional assessment, design, permitting, and oversight on aquatic habitat projects while providing educational and training opportunities for undergraduate and graduate students in aquatic habitat restoration studies.

Georgia (John Damer)

Brook Trout Sampling

Population sampling of wild trout in the summer of 2016 indicated a record low abundance of young-of-year brook trout. We believe the low reproductive success of brook trout in 2016 was linked to record high flow events in November 2015.

Brook Trout Habitat Improvements

In February 2017, WRD fisheries staff, in conjunction with the US Forest Service, implemented a large-scale brook trout habitat project on Tuckaluge Creek in Rabun County, GA. To increase the amount of large woody debris, more than 200 trees were directionally felled into the stream to provide overhead cover and create pool habitat for the wild brook trout population (“Chop-n-Drop”). Similar work is planned this winter in two adjacent brook trout streams.

Fire Impacts in Cohutta Wilderness Streams

North Georgia experienced extreme drought during the Summer and Fall of 2016, and the resulting dry landscape contributed to several large wildfires. The “Rough Ridge Fire” burned almost 28,000 acres within the Cohutta Wilderness Area of the Chattahoochee National Forest, especially in the Conasauga River Watershed. The fire produced very dense smoke, which is thought to be the cause of a fish kill documented on the Conasauga River mainstem. Specific impacts on wild trout populations are unknown, but we plan to sample the river in Summer 2017 to assess combined impacts of drought and fire.

USFS Foothills Landscape Project

Our agency is working with the US Forest Service on a large-scale assessment of the needs and opportunities to enhance fish and wildlife habitat in the “Foothills” region within the Chattahoochee National Forest. Some of the proposed trout stream enhancements include sediment and erosion control, culvert replacement, the addition of large woody debris and improved access for anglers and trout stocking trucks.

UGA Trout Angler Survey

A mail survey of 4,000 licensed Georgia trout anglers was administered by University of Georgia in January 2017 to assess trout angler preferences. Survey results are being compiled. This effort is part of a larger study by UGA, thru contract with GAWRD, to assess trout fishing supply (both stocked and wild) and demand in Georgia. Our agency will use these results to update our statewide trout management program and respond to current and future program opportunities, such as shifting angler demands, and program challenges such as aging infrastructure and habitat conservation.

License Restructuring

The Georgia Legislature recently passed House Bill 208, which will adjust resident recreational hunting and fishing licenses fees to more closely align with Southeast averages and simplify the recreational hunting and fishing license structure. Georgia’s resident hunting and fishing license prices have not increased in 25 years, and are generally the lowest in the nation. The changes put in place by HB 208 are expected to increase revenue significantly, both directly and through increased federal aid dollars. Proposed uses for increased funds will be: (1) Hiring 40 new game wardens, (2) improving wildlife habitat on WMAS & fish habitat in public waters, (3) increasing DNR staff presence with focus on public lands enhancements, (4) more and better shooting ranges, (5) boat ramp expansion and improvements in fresh and salt waters, (6) additional youth education and outreach, (7) more access on WMAs. Changes will take effect July 1, 2017.

Drought Impacts on Hatcheries

Georgia’s four trout hatcheries (3 state, 1 federal) have all been affected by the exceptional drought in 2016. In a typical year, around 1.1 million trout are stocked, but in 2017 that number may be closer to 1.0 million. Fortunately, we have had some relief in recent months and fish are healthy and growing rapidly. We expect most anglers will not notice the slightly lower stocking allotments.

Arkansas (Christy Graham)

The Arkansas Game and Fish Commission (AGFC) Trout Management Program (TMP) recently completed creel surveys on three of its tailwater trout fisheries, Bull Shoals, Norfolk, and Greers Ferry. All three surveys were conducted from December 2015-November 2016. Preliminary data indicate that lower stocking rates have not had a significant effect on angler catch rates of Rainbow Trout. Stocking rates were reduced at all three locations in Fall 2015 due to the discovery of the IPN virus at the Spring River State Fish Hatchery. Also, despite concerns from anglers, angling effort was high (928,213 h) but was not at record heights observed from 2002-2008. Catch rates during the 2015-16 creel survey were more related to angling effort than stocking rates (i.e., anglers caught fish at higher rates when angler effort was lower, and vice versa).

All five year-round trout fisheries in Arkansas experience significant flooding in Spring 2017. During the flood, the AGFC Spring River State Fish Hatchery was flooded and lost a significant number of trout on-site. The AGFC has been in contact with several state and federal trout hatcheries about obtaining eggs and fingerlings to help recover the losses from the flood. The AGFC Trout Program and hatchery staff are

working to re-distribute trout stocking numbers and will reduce stocking rates at several tailwaters until more fish become available.

In February 2017, the TMP conducted mail surveys of Bull Shoals and Norfolk Tailwater guides and anglers, and Greers Ferry anglers, to obtain more specific information about angler attitudes and concerns about the way the AGFC is managing those trout fisheries. A total of 717 (63%) anglers and 122 (35%) guides returned the Bull Shoals/Norfolk Mail Survey; a total of 481 (61%) anglers returned the Greers Ferry Mail Survey.

The TMP also revisited the management plan for the Greers Ferry Tailwater in 2016. Results from data collected by the TMP, along with public input solicited during two public workshops, prompted the TMP to propose and implement regulation changes including removal of the 16-24 inch protected slot limit, prohibiting culling of trout on the tailwater, and converting two areas from special regulations (artificial-only areas) to catch-and-release areas. As a result of the management plan process, the AGFC will also be partnering with a university to conduct a Brown Trout spawning study on the tailwater. Jim Habera explained that on the South Holston TW in Tennessee there can be too much reproduction of Brown Trout.

Christy asked the committee members if they have 1) any systems where night fishing is banned and if there are biological justifications for those closures; and 2) if they have areas where chumming is banned. The AGFC has heard many concerns from anglers that both night fishing and chumming are detrimental to the trout fishery (despite no biological data to support those concerns). Currently, Arkansas anglers are permitted to night fish on trout waters (except in one C&R area) and chumming is permitted outside of special regulations areas. West Virginia reported some quality zones that are open during daylight hours only. North Carolina and Georgia previously closed some trout streams at night but recently opened these up to 24 hours. Tennessee reported some national forest streams that are closed from sunset to sunrise. Kentucky reported they originally banned chumming only on the Cumberland Tailwater, but expanded the ban to reduce harvest within urban fishing programs. Missouri also permits chumming outside of special regulation zones.

In absentia update from Dave Kazzyak with USGS

- Barb Lubinski recently finished genotyping an additional 360 individuals from 12 streams in South Carolina and southwestern Virginia. These additional populations fill a major gap in our spatial coverage of the southern Appalachians.
- Casey Weathers just finished genotyping ~500 individuals from additional streams in Great Smoky Mountains National Park and a potential metapopulation in North Carolina. Barb is currently reviewing his scores. As soon as she is finished (next couple weeks), our data set will be complete.
- Moving forward, the next major step is to complete a sibship analysis on each of the populations. I have spoken with Yoichiro Kanno and Kasey Pregler, and they have agreed to take the lead on this effort. I plan to send the data set to them within the next few weeks.
- From there, we should be able to make rapid progress on developing a manuscript. I am planning on working closely with Yoichiro Kanno, Kasey Pregler, and Andrew Whiteley at this stage. I have a bunch of R code already written to handle many of the analyses with this large data set. I also have a fair bit of text already pulled together for the paper.

Miscellaneous Topics

Eric Cummins (KY) asked about the definition of a trout water. Georgia has established a cutoff of 22°C. North Carolina cuts off at 20°C. David Thorne offered to distribute a recent Ecology publication that compares thermal curves for lab and field.

The committee discussed chop and drop methods and what different states do to improve instream habitat. South Carolina looked at amount of woody debris in virgin timber reaches as a guideline. South Carolina increased pool habitat by 25% through chop and drop. West Virginia does not select a specific species of tree, just what is available. Dead hemlocks can be useful if they're not too dead. Good idea to fell a tree quartering upstream with trunk between two trees. These trees will lock in place.

The committee discussed the prevalence of "Kids Only" fishing areas. Arkansas has a hatchery outlet that is restricted to under 16 with mobility impaired angling with artificial lures and catch and release only. In Missouri at Roaring River Hatchery there is a hatchery outflow area used for kids only. North Carolina now recognizes a youth as up to 18 year old. In the 1960s, NC had women and youth only fishing areas. West Virginia has children and handicap only streams in parts of the state. Georgia has a short stretch below a hatchery.

Final Remarks and Adjournment

James Gray (USFWS) appreciated hearing the state agency commentary. From a federal perspective, trout management plans are helpful for the federal hatcheries. He thought it would be a good idea for the USFWS hatchery system to stay in close contact with the Committee and send local representatives to future meetings. Feel free to email or call James at any time.

John Damer stated that an invitation is not required to become a member of the TC, only that the person be a member in good standing with the American Fisheries Society.

Chair Whelan adjourned the meeting following these discussions.