Meeting Minutes of the Southern Division of the American Fisheries Society Trout Committee meeting convened on Tuesday, May 7th, 2024, at the Pipestem Resort State Park, Pipestem, West Virginia

The 2024 meeting of the Southern Divistion of the American Fisheries Society Trout Committee was called to order by Matt Lawrence at 9:00 AM Eastern Time. Welcome and housekeeping announcements were provided. Introductions went around the table. David Thorne was thanked for his efforts in securing the Pipestem State Park venue for the meeting. A quorum was present with over 10 voting members present.

West Virginia Chief of Wildlife Resources Paul Johansen provided opening remarks giving an overview West Virginia's trout program. WV is committed to native Brook Trout conservation with many of their stream restoration projects occurring on Brook Trout streams. WV continues their liming program to mitigate reduced ANC in watersheds. Hatchery renovations are critical to increase stockings and provide fishing opportunities.

Old Business:

Approval of 2024 Minutes:

The 2024 meeting minutes were sent out through email including round table discussions. Matt Lawrence asked for edits or suggestions regarding the minutes. None were provided. Matt Kulp made a motion to approve the minutes. David Thorne seconded, and the motion passed.

Treasurer's Report- Matt Lawrence via Christy Graham

Matt reported the account balance as of May 2, 2024, was $4,752.51. Annual expenses included SDAFS 2023 Facility Rental of the Ruritan Club for the meeting. Food Reimbursement to John Hammond for SDAFS 2023. SDAFS 2024 Cash Meeting Registration and Pipestem Resort State Park Facility Rental for 2024 meeting. The only expected income was from the 2024 meeting deposit return and registration. Bringing the expected balance in hand as of May 10, 2024, to $5,797.51.

Treasury Report, May 2, 2024
SDAFS Trout Committee Meeting

Balance on Hand (March 30, 2023):	$5,912.90
Income	
Pipestem Registration (Paid in Advance; 5 @ $65.00)	$325.00
Total Income:	$325.00
Expenses	
Ruritan Club (SDAFS 2023 Facility Rental Fee)	$100.00
John Hammonds (SDAFS 2023- Food Reimbursement)	$225.39
SDAFS 2024 (Cash for Meeting Registration)	$200.00
Pipestem Resort State Park (SDAFS 2024 Facility Rental Fee)	$960.00

Total Expenses:	$1,485.39
Balance on Hand (May 2, 2024):	$4,752.51

Expected Income

Pipestem Registration (Paid at Meeting; 13 @ $65.00)	$845.00
SDAFS 2024 (Re-Deposit Cash for Meeting Registration)	$200.00
Expected Additional Income	$1,045.00
Expected Balance on Hand (May 10, 2024)	$5,797.51

With no further discussion, Jim Habera made a motion to accept the treasury report. David Thorne seconded, and the motion passed.

Membership List Update:

Matt Lawrence sent an email out March 25th, 2024, asking members to review the SDAFS Trout Committee membership page and confirm that their contact information is correct. Any edits were asked to be sent to Jim Habera for updating the webpage.

Trout Committee Website Update:

Jim Habera provided and update for the Trout Committee Website and again requested pictures from the committee for the website. Matt mentioned the website has meeting minutes extending back to the 1960's. The Proceedings Document, past meeting minutes, membership list and pertinent information is on the website.

MicroFish Update:

Matt Lawrence provided a few updates. Approximately half of the downloads are from the US. Microfish is now used in 103 countries. It is also now designated as safe and being used by federal and state agencies. Jack is continually making updates to the program. He conducted an Excel workshop at the SDAFS 2023 meeting in Chattanooga. Jack is also working on putting together and YouTube channel for training. The website for MicroFish is https://www.microfish.org/.

Brook Trout Subcommittee Update:

Jim Habera – sent survey asking for information on each states genetic microsatellite trout information. New analysis will include VA and WV which wasn't included in the past. This is an effort to update the 2005 publication - **Managing Southern Appalachian Brook Trout:** A Position Statement. Jim will resend survey.

Student Scholarship Update:

There was discussion to create a Student Scholarship to increase student participation in the committee. An annual registration fee for the SDAFS Trout Committee meeting was suggested to raise money for student scholarship. It was not voted on, but there was agreement among the committee for annual registration fees. Joe, AR State Chapter mentioned moving funds to a fidelity account. Fink explained the VA Chapter of AFS uses a fidelity account as investment for scholarships. Suggestions to contact SDAFS Executive Committee regarding donation to kick start funding for a scholarship. Matt motioned to set aside $500 scholarship it was seconded and approved. Jim Habera suggested requesting startup funding for scholarship from State AFS Chapters.

New Business:

Election of Officers

Matt Lawrence opened the discussion and asked for nominations or volunteers to serve as chair from 2025 to 2026. Matt Lawrence motioned to make Tyler Hern the chair from 2025 – 2026. No other nominations were presented. Jim Habera seconded, and the motion passed.

Meeting locations for 2025

The SDAFS Trout Committee Meeting will be held in Ashville, NC in concurrence with the annual SDAFS Meeting. Jack Rash will reserve a room for the Technical Committee meeting.

East Coast Trout Meeting

The East Coast Trout Meeting covers everything trout. Wild trout, stocked trout, hatchery operation and restoration with research and presentations on all these topics. The meeting has historically been held every 5 to 7 years. Wild Trout Conference will be held in 2025. It was discussed and agreed not to hold East Coast Trout the same year. Some mentioned not the same fiscal year of their Department/Agency. Discussions led to planning East Coast Trout for June of 2027. Canaan Valley State Park or Cacapon State Park were discussed as locations. Canaan seemed to be the preferred to investigate. David Thorne and Brad Fink will investigate Canaan in Spring or Summer of 2025.

Workshops and Training

Matt Lawrence asked for thoughts/suggestions on workshop or training needs. Jim Habera suggested contacting Jack Van Deter to see if he would be interested in conducting a workshop at SDAFS in 2025.

Other New Business

Matt asked if there were any new business issues to address. Themes for the 2025 meeting was discussed.

- Reintroduction strategies was suggested by Matt Lawrence.
- Matt Kulp recommended discussing a tool to look at long-term datasets on small systems instead of regionally. Basically, developing a tool to investigate long-term trends.
- Jake Rash recommended the topic of over crowding and increased angling pressure on stocked trout streams. How is this impacting the angling experience?

- Jake Rash also suggested a topic focused on conserving public access to private lands for stocked or wild trout fishing.

Break

Presentations

Kyle Hartman's Lab

Alexander Lamping - Are stocked trout anglers catching and harvesting wild Brook Trout in stocked trout streams

Sabrina Siegan - Examining Temporal and Spatial Variation in Native Brook Trout Spawning Events in Appalachian Headwater Streams

Cory Bauerlien - Repeatability of an ecologically applicable thermal tolerance metric (Tc) reveals "heat weakening" in a salmonid

Lunch

Return 1:30 Presentations

Joe Kaiser - Arkansas trout stocking characteristics, successes, and challenges from 2004-2023

Dan Rankin - A history and status update of trout stocking in South Carolina

Matt Lawrence - Tailwater Stocking Model: An Opportunity for Collaboration

Day 1 Adjourn 4:08 PM

Day 2 Call to Order 9:03 AM

Round Table Discussions

Round table notes from each state are included below.

Final Thoughts

A motion was made to adjourn the meeting by David Thorne and seconded by Jake Rash. Meeting adjourned at 11:06 AM.

Round Table

Arkansas

Report Provided by Joe Kaiser (Submitted by Christy Graham) - AGFC

Population monitoring – The AGFC Trout Management Program (TMP) conducts electrofishing surveys every year on the year-round trout waters. In 2024, the TMP conducted annual monitoring on Beaver Tailwater, Spring River, Dry Run Creek, and Collins Creek. The program did not sample the other fisheries because of temperature issues during the normal sampling time and because it opted to allocate effort towards research projects on the Little Red River (Greers Ferry Tailwater; see below). However, all populations surveyed looked to be in good condition, both number and size wise. If you are interested in detailed results of AGFC's annual monitoring efforts, annual reports are available on AGFC's website (click here).

Creel surveys – The TMP completed a creel survey on Narrow Tailwater in southwestern Arkansas in August 2023. The creel survey report is nearly completed and will be followed up with a mail survey. The TMP initiated a creel survey of Beaver Tailwater in September 2023 which will be completed in August. A creel survey of Spring River will start this September.

University of Arkansas at Pine Bluff research – Over the past 5-6 years, UAPB has conducted studies on Brown Trout habitat use, growth, and movement on the Greers Ferry Tailwater. AGFC refers to those studies as 'Phase I' of the research. "Phase II" of projects started in December 2023. Phase II entails studying Brown Trout movement at finer spatial and temporal scales using radio telemetry and examining shifts in fish assemblages downstream of the managed portion of Greers Ferry Tailwater (i.e., Lower Little Red River; LRR).

The TMP assisted the University in performing radio tag surgeries on 150, ≥ 14-inch Brown Trout collected from Greers Ferry Dam to approximately 48 miles downstream. University personnel have tracked those fish since December with stationary receivers and by manually tracking. Average monthly movements have decreased the further it is from the spawning season (which occurs from November through February on the tailwater). Average monthly movement for individual trout ranged from 27 miles in December to 2 miles in April. One fish moved nearly 800 miles in its first 6 weeks following surgery. It will be interesting seeing how dam water releases might play into movement during the study.

In the Lower LRR, university personnel collected 31 fish species during the winter and spring samples. In April, the distance downstream where trout were collected had decreased by ~4 km compared to December (i.e., less trout further downstream as water temperature has increased). Additionally, UAPB is monitoring water temperature from the dam down to Searcy, Arkansas (approximately 50 miles of river). They will attempt to develop a water temperature model to help AGFC communicate to the public, Army Corps of Engineers, and Southwest Power Administration about water temperatures on the tailwater. Temperature data will also be incorporated into the final results of the fish assemblage research.

AGFC will also be starting a new Brown Trout growth and movement study with the University on the upper 30 miles of Bull Shoals Tailwater. The research will be similar to the studies being conducted on the Greers Ferry Tailwater. Two graduate students will be selected to mark and PIT tag Brown trout in that

stretch of river and will use telemetry to determine if fish are utilizing catch-and-release areas on the fishery.

Revisiting the statewide plan – AGFC is in the process of revisiting the statewide trout management plan, which was created in 2004. The plan is being developed with input from both stakeholder and technical advisory committees. The TMP has conducted three stakeholder advisory committee meetings to solicit input to identify the key areas for the plan, issues and values for each key area, and input for formulating goals for each area. The TMP is in the process of drafting the introductory material and goals for the plan, and will be hashing out the specific objectives and strategies with the technical advisory committee at a retreat in June.

Trout permit holder survey – AGFC contracted with HDNR Consultants, Inc. to conduct a survey of trout permit holders in 2023. The report is final and was completed prior to engaging with the stakeholder advisory committee. Based on respondents input, HDNR estimated that trout permit holders spent $236,536,657.48 in trout fishing expenditures in Arkansas in 2023. Please reach out to us if you would like a copy of the survey report.

Facebook trout poll – The TMP also worked with AGFC's Communications Division to conduct a 'trout poll' on Facebook prior to revisiting the statewide trout management plan. The poll was very simplistic and asked people where they most fished for trout and what were their likes and dislikes about trout fishing in Arkansas. We received thousands of responses from this simple poll, and interestingly, responses were similar to those reported during the 2023 trout permit holder survey.

In-house projects – The TMP is currently evaluating Brown Trout growth and survival on Beaver Tailwater and Spring River. Additionally, the program just completed a diet study of Spring River trout and sportfish and has drafted a report of a tagging study conducted on Dry Run Creek and Norfork Tailwater.

In need of a biologist – AGFC will be advertising for a Trout Management Program Biologist position soon. If you know of any quality candidates who might be interested, please pass the information along to them. Please have anyone that may be interested reach out to Christy Graham if they are interested or have questions regarding the position. Our agency recently adjusted salaries, and the starting pay will be over $60,000.

Coldwater Habitat Program – The program recently hired a new biologist who will start on May 13th. The program conducts a number of bank stabilization projects along the trout waters every year, and they hauled 5,195 tons of rock for private and AGFC stabilization projects in 2023.

Georgia

Submitted by John Thomson (GA DNR)

Wild Trout

Brook Trout Genetics – We have finally secured funding and approval to have the final 570 samples from 19 streams processed ($50,000). These samples are from a 2015 sampling effort that was made up of 930 samples from 31 brook trout streams. The data received will drive future management decisions.

Georgia is perfecting their eDNA sampling techniques to detect brook trout. We are working with UGA and we have had mixed results. Looking to establish increased confidence and understanding of limiting factors with this type of testing.

Wild trout stream fishing pressure has always been perceived as non-impactful on abundance in Georgia. The implementation of trail cameras to provide fishing pressure data on wild trout streams has been very informative. This data will/can be cross-referenced with our standardized sampling data to determine the effects fishing pressure are indeed effecting abundance.

Questions for the group:

Georgia has unique brook trout habitat that requires dedicated anglers to target these populations. Are regulations necessary to protect these populations? Do other states have specific regulations regarding brook trout, and do you think they are working? **Consensus from the group was it would be a social reg that would not provide any additional protection for wild brook trout stocks.**

Hatchery Production

Georgia program has returned to stocking a million catchable trout a year. Typically, our stocking program is 90% rainbow, 10% brown, and whatever brookies we can keep alive. Our catchable goal is 10 inches and 90% of stocked trout hit the goal. We have a "big fish" program that traditionally stocked 30,000 12 inch trout annually. This year we increased the big fish from 12" to 14" because our survey data shows that our anglers prefer to catch fewer but larger trout. There is always a tradeoff, we only plan to stock 15,000 of the "big fish" 14 inch tout in 2024. Evaluation of this change is still underway, but these larger stocked trout are showing up in the creels and on social media.

We stock trout in approximately 80 waterbodies in Georgia but are careful not to stock brook trout where potential connectivity to native populations could occur.

Poor water quality this fall at our largest trout hatchery (Buford Trout Hatchery) a tailwater hatchery was extremely detrimental to trout stocks in 2023. We are accustomed to high levels of Fe and Mg and have developed measures to mitigate these conditions through recirculating water and parasite treatments, but this was different. We typically see our highest mortality rates in October (15^{th}-30^{th}). In 2023, our highest mortality occurred September (15^{th}-30^{th}). There are many variables, but we now suspect hydrogen sulfide is playing a major role. We plan to monitor and peruse other mitigation strategies.

Closing Note (and not discussed)

Georgia introduced a Trout Slam in 2023. This requires that an angler documents catching all three species of trout found in Georgia to receive a certificate and a sticker. We were surprised and how many applications were submitted (300) and what folks will do for a sticker.

Great Smoky Mountains

Submitted by Matt Kulp (NPS)

Project Updates

1. Antimycin Re-Registration
    a. USGS bought intellectual property rights and is working on re-registration.
    b. Successfully revived strain; now working on QA/QC procedures and large-scale production
    c. Changing formulation to remove acetone and replace with stable compound.
    d. Goal to submit reregistration packet to EPA in 2025; 2026 production.
    e. Postponed approval of "experimental use" for Moore Springs Br. until 2025

2. Moore Springs Branch (NC) Brook Trout Restoration (3.8km) (Twentymile Creek watershed)
    a. Pre-treatment fish population monitoring in 3 sites in 2022, 2023, 2024.
    b. Sept 2025 antimycin treatment (NCWRC, NC TU assistance)
        i. USGS scientists will participate to observe and do instream detection assays.
        ii. Great training opportunity for partner staff
    c. Will translocate 600 Brook Trout per year for two years from 3-4 Little TN River watershed source stocks.

3. Brook Trout Restoration in 6 NC and TN Streams 2023 (10.3 km total)
    a. Range in size from 0.8-3.8 km in length (all 2nd order or larger)
        i. Lower elevation range (1,300-1,700 feet)
    b. Moved 1,282 Brook Trout from eight source stocks (target 200 fish/mile)
        i. Dropped one stream due to small size/limited habitat
        ii. Replaced it with headwaters of Anthony Creek (TN)
    c. Worked out study design to evaluate 8 different source stocks and ability to persist in higher temp streams (UT PhD candidate)

    ** TOTAL 19 streams and 36.7 miles of Brook Trout water restored to date*

4. GRSM Assisted SC DNR with Brook Trout Restoration on 7.4km of Pigpen Branch in Sumter National Forest in fall 2023
    a. GRSM assisted with antimycin treatment to remove Creek Chub (192 exposures)

b. Project successful despite need for repeated treatments of stream due to high Creek Chub tolerance, inconsistent product, confounding pond inflow, weather issues.

c. Kudos to Rankin and staff for getting project across finish line despite challenges.

5. 2023 GRSM Trout Distribution Surveys
    a. Completed trout distribution surveys in Panther Creek (TN)
    b. Trout distribution surveys completed in 83% of park to date
        i. Goal to complete 3% in 2024 (Noland Creek, Hazel Creek, others)
    a. Fausch *et al.* 2024 found GRSM Brook Trout mean pop. segment length = 1,025m (range 380-12.8km)
        a. Japanese charr much <1,025m (mean 94-375m)
    b. Interesting Distribution Facts:
        ii. Distribution completed in 2,385 of 2,900 miles (82% surveyed)
            1. *476 miles have trout (20%)*; 1,909 miles contain no trout (80%)
            2. <5% of 1st or 2nd order occupied; >95% 3rd-5th order occupied
                a. Brook occupy 242 miles (51%); 238 stream segments
                b. Brown occupy 103 miles (22%)
                c. Rainbow occupy 361 miles (76%)

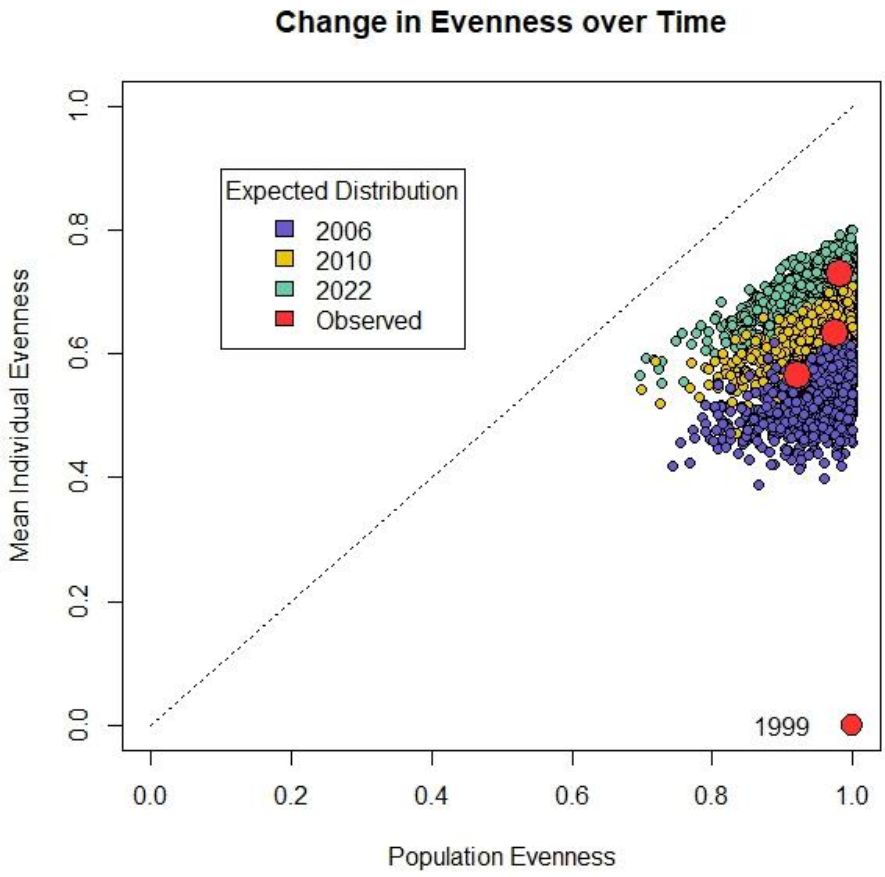
6. Trout Population Long-Term Monitoring Results
    a. GRSM Brook Trout population monitoring summary stats
        i. BKT presence increases above 850m (2,800 feet); most pops 2,800-5,500 ft
        ii. CV's (SD/mean) higher for YOY (0.9) than adults (0.6)
        iii. Natural variation of YOY and adult trout generally within 2 sigma (SD) of mean
        iv. Biomass and K significantly lower in acidified streams (303d)
        v. GRSM pops appear stable; not seeing declines in pops at any elevation
            1. Stream temps appear stable across most Vital Signs sites
    b. Lu *et al.* 2023 (*trends in long term fish monitoring data at GRSM*)
        i. More rainfall helped offset the harmful effects of hot summers and high winter flows decreased recruitment of newborns across many streams
        ii. Different streams were better/worse suited to maintaining brook trout populations because they provided more stable conditions for spawning and hatching eggs.
        iii. Cooler streams with consistent flow, signs of groundwater input, were better for brook trout to survive to maturity

iv. Finding summarized in "*Regularized Latent Trajectory Models for Spatio-temporal Population Dynamics*" in Journal of Agriculture, Biological and Environmental Statistics
v. Results summarized in blog: https://secasc.ncsu.edu/2024/04/23/brook-trout-populations-statistical-method/

c. Shenandoah NP Brook Trout pops have declined >50% in 2/3 of streams in last 25 years!
i. Most pops in basaltic and granitic watersheds exhibited sharp declines
ii. Siliciclastic (sandstone) streams with larger watersheds had estimated increases in adult BKT abundance of 2x-5x
iii. Siliciclastic streams (sandstone) showing signs of improving water quality.
iv. Stream >1,700 feet have been stable over this period; most streams <2,500'.
v. Summarized in "*Strong variation in Brook Trout trends across geology, elevation, and stream size in Shenandoah National Park*" in TAFS.

7. University of Tennessee (UT) Study on Genetics of Restored Brook Trout Populations (Smith & Fitzpatrick)
a. Focusing on determining how temperature of source stock streams affects genetics of newly established brook Trout populations over time.
b. Focusing on 6 restored populations and 12 source stocks (some 28 years out)
c. Assessed and discounted assortative mating – populations mixing as predicted.
i. Richards et al. (2008) appears to be flawed due to model assumptions.
ii. Reanalyzed 2006, 2010, and 2022 data – found equal contributions.
iii. Ran simulations and actual data mimics simulations.

iv. Good news as multiple source stocks are mixing.



v. Summarized in paper submitted to *Conservation Genetics* in press titled, "*Genetic Structure of Restored Southern Appalachian Brook Trout Populations Indicates Successful Reintroductions*."

8. Brook Trout Genetics TN Pops Completion
    1) Going to sample remaining 9 TN pops with microsattelites (allozymes on some, others nothing)
    2) In need of someone to run sample analysis (USGS overhead too high)
    3) Installed HOBO's on source streams to monitor source ranges compared to receiving streams

9. TN Council TU Meeting – Climate Change Questions
    a. Impacts of Climate Change and Population Growth on GRSM coldwater resources over the next 25 years …specific questions:
        i. *How is your organization mobilizing to understand and respond to Climate Change and Regional Population Growth…*

ii. *What will you do differently than you have done in the past and how will you do it?*

b. Recent studies in east and west highlighted the importance of groundwater on headwater stream temperature resiliency (need for more research in this area).

10. Angler Access Surveys Across GRSM
    a. Conducting surveys of large river and streams to identify places for potential a) ADA compliant angler structures, b) safer access to streams for anglers, tubers, swimmers, etc.
    b. Looking for feedback on structures other states have installed that their ADA anglers like and ideas to stay away from ax well. Any feedback is much appreciated.

For more information on any of these projects, please contact Matt Kulp (865) 436-1254 or Mat_Kulp@nps.gov

Kentucky

Submitted by Nathan Hayes (KDFW)

- Continuing work on revising the Trout management plan
- Cutthroat have been removed from the Cumberland Tailwaters stocking.
- Cumberland Lake Aeration Project will begin in the Fall of 2024 to improve oxygen levels.
- Continued backpacking Brook Trout into Parched Corn using volunteers.
    - EKU grad student working on a project related to Brook Trout in Parched Corn.
- Considered stocking larger fish 12+-inch rather than 9+-inch fish in the Fall in federal Red River Gorge streams.

Maryland

Submitted by Matt Lawrence

2023 Survey Activities

Coldwater Fisheries Program 2023 survey activities included data collection from 51 survey stations that are part of Maryland's annual brook trout population monitoring network, seven patches that lacked recent population density data, and 44 stations to determine coldwater potential. The results of the surveys addressed several data gaps and found seven previously undocumented wild trout populations. These data may provide evidence for additional regulatory protection in several of the streams.

Brook Trout Patch Assessment

A statewide brook trout patch assessment was completed in 2020 to identify stronghold populations and to improve strategic application of limited resources. The assessment used five criteria for scoring, with patches receiving one point for each criteria met. Patches that meet four or more criteria were considered to be strongholds. At the completion of the initial analysis, eight patches were identified as strongholds. Data gaps created some limits for the analysis, particularly for population density and genetics. Efforts to address the data gaps have been ongoing and an update to the patch assessment is currently underway. The preliminary analysis suggests that six additional brook trout patches may be identified as strongholds, for a total of 14 stronghold patches.

Brook Trout Reintroductions

In the spring of 2023, 30 brook trout were released to Green Spring Run in Washington County. A follow up electrofishing survey was conducted in the fall of 2023 to determine if the fish persisted through the summer. Only one of the translocated fish was recovered. A second survey will be conducted in 2024 and temperature data will be collected throughout the summer. The results will be used to determine if additional fish will be reintroduced to the stream. Statewide survey efforts have identified three other candidate streams for reintroduction, so project activities may pivot to these options.

Brook Trout Propagation

The Coldwater Fisheries Program met with staff from West Virginia DNR to observe West Virginia's brook trout propagation methods and to tour their facility. Maryland will pursue a small propagation project that will field strip brook trout and fertilize the eggs prior to returning them to a small hatchery operation for rearing. Projects are being developed to place eyed-eggs in a receiving stream using Whitlock-Vibert boxes and to maintain and raise some of the eggs to the fingerling stage for stocking. Initial project activities will be a proof-of-concept with the goal of developing the methods for both reintroductions and supplemental stocking.

Brook Trout Genetics

Brook trout fin clips continue to be collected for genetic analysis to provide additional data about genetic health of brook trout patches and to close data gaps in the brook trout patch assessment. Clips from eight patches were collected in 2023 and submitted to USFWS Northeast Fishery Center in Lamar, PA for analysis. In addition to effective population size, Maryland is pursuing structure analyses to improve our understanding of the relationship between patches throughout the state. A structure analysis has been performed in the past, but an updated analysis with additional data from newly sampled patches will support efforts to find suitable source populations for reintroduction protects.

North Branch Potomac River

Fisheries managers continue to work with Maryland Department of the Environment to improve regulatory protection for North Branch Potomac River. The river is currently designated as warmwater below the Savage River confluence, but coldwater habitat is expanding and trout spawning has been observed downstream. Coldwater obligate benthic macroinvertebrates were collected in the spring of 2023 and young-of-year brown trout were observed in September of 2023. Temperature data continues to suggest that the thermal regime meets coldwater criteria as far downstream as Keyser, and coolwater criteria to Pinto. Data collection is continuing in 2024 and an existing use determination with improved thermal protection is expected later this year.

Beaver Creek Fish Kill

A fish kill occurred in August, 2023 at Beaver Creek near Hagerstown. Beaver Creek was a popular wild brown trout fishery and had one of the highest population densities in the state. The fish kill resulted in near total mortality from I-70 to approximately 1.5 miles downstream. Heavily impacted stream sections included some of the highest population densities and best spawning habitat. The cause of the fish kill has not been determined. In late September, brown trout were collected from downstream reaches and reintroduced to the affected section in an effort to expedite recovery. Monitoring activities are on-going.

Coldwater Fisheries Advisory Committee

Maryland's Coldwater Fisheries Advisory Committee meets quarterly to advise the department on coldwater fisheries management. In early 2024, the committee discussed several controversial issues regarding brook trout regulations and management. These issues included a statewide zero creel limit for brook trout and a cessation of stocking in streams that support brook trout populations. The committee has also investigating ways to advocate for impervious surface caps in watersheds that support coldwater resources. As of a meeting in April, the committee has opted to support the department's current stocking practices and has not determined how to proceed on a change to brook trout creel limits. Discussions about impervious surface caps and a strategy for advocacy are ongoing.

Coldwater Hatchery Renovations

Maryland's coldwater hatchery infrastructure is aging and in need of considerable investment for restoration. Both Albert Powell Trout Hatchery in Hagerstown and Bear Creek Trout Hatchery in Accident require major renovations and upgrades. Upgrades for Albert Powell Trout Hatchery will be initiated soon and will occur in two phases. The first phase will upgrade wastewater treatment to more effectively meet the state's water quality criteria. This phase is expected to be completed in 2024. The second phase is a much larger project that will build new culture facilities and cover the existing raceways. This work is projected to begin in 2025.

Bear Creek Trout Hatchery is an older facility that will require substantially more work with several challenges that limit the efficiency of resource investment. Consideration of alternative options is underway, including both new hatchery locations and alternative options. The Bear Creek facilities will not be abandoned, but facility production may be reduced to maximize the use of available funding.

Coldwater Fisheries Management Plan

Maryland is developing a Coldwater Fisheries Management Plan to set coldwater goals and actions for the state. The last management plan was specific to brook trout and was implemented in 2006. The new plan will set management goals for all wild trout species, establish a stocking formula, provide guidance for project review and habitat improvement projects, and create clear targets for expanding angler access. A meeting with regional staff has been scheduled for the summer to gather information and ensure that regional and local challenges are addressed in the plan. A completed product is expected in 2025.

Outreach

The Trout Fishing in Maryland webpage was redesigned and updated for public use. The previous version was redundant with the Trout Stocking page. The new version streamlines access to information about obtaining a license, quality fishing resources, and regulations. It also highlights featured fishing locations, educates the readers about various fisheries management strategies, and provides tips on how to safely handle fish and improve water quality.

North Carolina

Submitted by Jake Rash (NCWRC)

Socioeconomic Survey

Trout fishing is an important recreational activity in North Carolina. Thus, it is important for the North Carolina Wildlife Resources Commission (NCWRC) to understand trout angler opinions of management within its Public Mountain Trout Waters program (PMTW). To achieve this, the NCWRC conducted a social science project in 2023 to assess public perceptions on management of trout and expenditures on trout fishing in PMTW. An emailed survey was sent to a random sample of 22,650 resident and 2,500 non-resident license holders that held fishing privileges at any point during 2022. In 2022, approximately 369,968 anglers fished for trout in PMTW and provided an overall economic impact to North Carolina's economy of $1.38 billion. Most survey respondents reported that their participation in trout fishing has not changed over time, and in addition to places where fish would be caught, they indicated that locations on public land and secluded locations were important when deciding where to go fish. Stocked-trout resources were popular among respondents, with Hatchery Supported Trout Waters and Delayed Harvest Trout Waters as the waters fished most. As found in previous surveys, trout anglers were satisfied with PMTW, with 76% of respondents being somewhat or extremely satisfied with their trout fishing experience. Lack of trout and overcrowding were the most common reasons for angler dissatisfaction. In addition, this project continued to highlight the challenges associated with the loss of angling access and the importance of retaining and increasing access into the future. This, like previous trout angler research, provided the NCWRC with critical socioeconomic information to help guide its PMTW.

Brook Trout Genetics

The NCWRC has been collecting genetic information for the State's Brook Trout in conjunction with trout distribution efforts. In 2016, 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, most populations show limited evidence of introgression by northern origin hatchery strains. Since 2016, additional Brook Trout have been examined, and approximately 500 additional individuals have been processed annually. These results represent valuable information for management and restoration efforts of Brook Trout in North Carolina. In 2023, a phylogenomic study was initiated to further understand adaptive potential and deep evolutionary lineages among populations, refine estimates of genetic relatedness and diversity, improve understanding of the distribution of adaptive traits across the landscape, and provide unprecedented insight into patterns of local adaption and past connectivity, which will increase the efficacy of brook trout reintroduction and restoration activities in North Carolina. Relevant publications since previous Trout Committee update:

White, S. L., J. M. Rash, and D. C. Kazyak. 2023. Is now the time? Review of genetic rescue as a conservation tool for brook trout. Ecology and Evolution 13:e10142.

Brook Trout Restoration

The NCWRC has used recent genetic data to plan Brook Trout restoration activities. Since 2019, we have worked with partners to conduct 19 projects via the translocation of fish from selected source populations. Additional restorations are planned for 2024.

Citizen Science Temperature Monitoring

In 2023, a volunteer effort began to establish a long-term temperature monitoring network in North Carolina's coldwater streams. Led by Trout Unlimited members, this project utilizes temperature loggers equipped with Bluetooth technology that allows data uploads via mobile devices. These data are then transferred to NCWRC staff and incorporated into local and regional databases. In addition, volunteers will help capture streamflow estimates via participation in the USGS Flow Photo Explorer project (link), which utilizes timelapse photos from game cameras. Additional monitoring sites will be established in 2024.

Bobby N. Setzer State Fish Hatchery Renovation

Bobby N. Setzer State Fish Hatchery is the NCWRC's largest trout hatchery. Built in the late 1950s, the facility's aging infrastructure requires replacement before a potentially major failure. Beginning in 2025, the hatchery will undergo a major renovation that will result in a reduction in trout stockings during the 2025, 2026 and potentially 2027 trout stocking seasons. During the renovation, our goal is to provide trout angling opportunities at all Public Mountain Trout Waters locations via a reduced schedule.

Bobby N. Setzer State Fish Hatchery Renovation: Social Science Evaluation

This renovation project has the potential to significantly impact trout fishing and its associated activities throughout the state. The renovation from start to finish is expected to take approximately 2 years, but the cumulative effects (e.g., lag time in post-renovation production) could last into 2027. As such, there is the unique opportunity to assess trends in participation, angler preferences, number of anglers that temporarily "lapse" or permanently drop out, and satisfaction before, during and after the renovation project. It is important to gauge opinions at all three times related to the disruption to be able to compare opinions across all timelines. These updated data will provide insight into potential angler impacts (and associated, timely remediations), develop a case study to inform the NCWRC and other agencies facing similar challenges, and will guide future management decisions. Literature on angler adaptation to fishing quality changes is minimal and thus, this proposed project would fill a significant knowledge gap. Additionally, this project will provide a continued line of communication with anglers throughout the disruption, allowing for increased trust and engagement with the public.

Catch Orientations

Catch orientation is a multidimensional concept that captures anglers' attitudes towards catching some fish, many fish, large fish, and keeping fish. Using data from a statewide survey, we segmented trout anglers into catch orientation clusters. We then explored differences and similarities of angling characteristics among the identified clusters. We identified three unique clusters of North Carolina trout anglers: non-catch oriented anglers, consumptive anglers, and trophy anglers. Consumptive anglers were unique in their positive attitudes towards catching many fish and keeping fish, using natural bait and artificial lures, angling in streams with the least restrictive rules, and being motivated by social activity-general factors. Trophy anglers were unique in their positive attitudes towards catching trophy (large) fish and the activity-specific motive of fishing for sport. Also, they prefer to fish in streams that are stocked with trophy fish and have catch-and-release regulations for half of the year. Non-catch-oriented anglers scored lowest on most catch orientation metrics, were motivated by the activity-general motives of "nature," and preferred angling in the most abundant and dispersed network of streams. Managers

can use these descriptions to meet management plan goals, examine access issues, and engage with the public. Our data also provides a snapshot of angler reliance on different types of PMTW, which has implications for hatchery and crowding management. Relevant publications since previous Trout Committee update:

Robinson, K. W., and J. M. Rash. 2023. Using catch orientations to identify clusters of North Carolina trout anglers. North American Journal of Fisheries Management 43:984–999.

Trout Management Plan Revision

The NCWRC's original Trout Management Plan was adopted in 1989 and revised in 2013. In 2024, the NCWRC initiated a process to revise the current Trout Management Plan. Further information will be provided to the Trout Committee throughout the revision process.

Trout Conservation Flows Downstream

The NCWRC continues to highlight how trout conservation can have a larger conservation footprint within a watershed. Specifically, an advertisement in the NCWRC's regulation digest continues to encourage trout anglers to help conserve the state-listed Hellbender. In addition, staff developed an article for *Wildlife in North Carolina* magazine to educate trout anglers about the native, non-trout species that they may catch while trout fishing (link).

Reducing Regulatory Complexity

Beginning in August 2024, NCWRC's Public Mountain Trout Waters will be managed by five regulatory classifications. Historically, seven regulatory classifications were employed, but since 2021, the NCWRC has combined two catch-and-release regulations into one and removed a geographically limited regulation that allowed the use of natural bait in wild trout waters.

Trout Health

In 2015, *Myxobolus cerebralis* (*Mc*; the parasite that causes whirling disease) was confirmed in Rainbow Trout collected from Watauga River – the first documentation of the parasite in North Carolina. Subsequent testing of oligochaete hosts and wild trout stocks found the parasite in eight major river basins (Catawba River, French Broad River, Hiwassee River, Little Tennessee, New River, Savannah River, Watauga River, and Yadkin River basins). In addition, gill lice (Copepoda: Lernaeopodidae: *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. Although the NCWRC has conducted a multi-year research project with researchers from Auburn University to explore the distribution and life history characteristics of *Mc* and *Salmincola* in North Carolina, the NCWRC continues to sample trout populations across the mountains of North Carolina to aid these investigations (e.g., responding to angler reports, evaluation of potential native Brook Trout propagule sources for population restoration, and addressing a spatial deficiency in testing results). In addition, the NCWRC continues to support testing of private aquaculture facilities to ensure trout supplied for NCWRC-issued stocking permits are free of *Mc* and gill lice.

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. In 2018, Tennessee Tech University researchers began a study to determine didymo prevalence in Tuckasegee River and other potential waters throughout the State. Anglers were equipped with sample kits in 2019 to continue assessment of the algae's spatial distribution. Additional information about this community science effort can be found at this (link).

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. 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). These stockings have been incredibly popular with anglers, and in 2019, they were expanded into the piedmont region of North Carolina.

General Aquatic Nuisance Species

The NCWRC has continues to develop a website devoted to aquatic nuisance species (ANS): www.ncwildlife.org/ANS. Currently, this page provides specific information about whirling disease, gill lice, didymo, and hydrilla. Available information also provides details regarding minimal steps to help prevent the spread of ANS (these steps have also been incorporated into NCWRC signs and messaging): CLEAN equipment of all aquatic plants, animals and mud; DRAIN water from boats, live wells and all equipment; DRY all equipment thoroughly; and NEVER MOVE fish, plants, or other organisms from one body of water to another.

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. These occupancy data help support numerous conservation efforts (e.g., Eastern Brook Trout Joint Venture range-wide assessment, research [NCWRC, partner, and university], land acquisition, conservation planning, etc.). In addition, ancillary data collected via these samples populates critical, regional databases (e.g., Brook Trout restoration sites, habitat restoration opportunities, barrier inventory, etc.). In 2022, the NCWRC had a two-person crew (the Brook Trout Crew) focused on these collection efforts, and last year, the Brook Trout Crew conducted 149 surveys on 44 streams across 12 counties and six major river basins, collected genetic tissue from 32 Brook Trout populations, and discovered two Brook Trout populations that were unknown previously. One of these unknown populations was within the Hiwassee River Basin, which was a geographic area of focus in 2023 (19 surveys completed).

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. Colorado State

University researchers are 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.

Brook Trout Population Responses to Climate Variation Across the Southeast USA

Led by researchers at Colorado State University, and in conjunction with researchers at the NCWRC, U.S. Geological Survey Leetown Science Center, Great Smoky Mountains National Park, and U.S. Forest Service Southern Research Station, this project seeks to take a manager-centric, co-production approach to characterize how and why climate change impacts on Brook Trout populations differ over space in the Southeast USA. This project is composed of three phases: (1) Evaluate the robustness of GIS-derived landscape data to predict spatial variation in measured stream temperature and link thermal regimes to trout population stability over time, (2) Predict spatiotemporal variation in trout abundance and project population responses to future climate patterns for all stream segments, and (3) Develop a web-based decision support tool to inform and engage federal, state, and local partners managing coldwater resources. Each phase will inform the next, and upon completion, this project will have three primary outcomes: (1) allow trout managers to update their sampling protocols by identifying how often and where to sample given limited time and resources, (2) inform prioritization efforts at regional scales (e.g., Southeast Conservation Adaptation Strategy [SECAS], Southeast Aquatic Resources Partnership [SARP], and Eastern Brook Trout Joint Venture [EBTJV]) by identifying climate refugia and populations at greater risk, and (3) function as a planning tool to assist managers with spatial prioritization of management actions by ranking streams based on their population vulnerability to climate variation. Relevant publications since previous Trout Committee update:

Valentine, G. P., X. Lu, C. A. Dolloff, C. N. Roghair, J. M. Rash, M. B. Hooten, and Y. Kanno. (*In Press*). Landscape influences on thermal sensitivity and predicted spatial variability among brook trout streams in the Southeastern USA. River Research and Applications.

Lu, X., Y. Kanno, G. P. Valentine, J. M. Rash, and M. B. Hooten (*In press*). Using multi-scale spatial models of dendritic ecosystems to infer abundance of a stream salmonid. Journal of Applied Ecology.

Valentine, G. P., X. Lu, E. S. Childress, C. A. Dolloff, N. P. Hitt, M. A. Kulp, B. H. Letcher, K. C. Pregler, J. M. Rash, M. B. Hooten, and Y. Kanno. 2024. Spatial asynchrony and cross-scale climate interactions in populations of a coldwater stream fish. Global Change Biology 30:e17029.

Lake Nantahala Kokanee Salmon Population

Kokanee Salmon *Oncorhynchus nerka* were stocked in western North Carolina reservoirs during the early 1960s, but Lake Nantahala was the only system that successfully produced a self-sustaining population. In 2014, the state record fish (4 lb and 1 oz) was caught, but since that time anglers reported lower catch rates and the emergence of a Blueback Herring *Alosa aestivalis* population within the reservoir. Exotic to western North Carolina, Blueback Herring are a planktivorous competitor of Kokanee Salmon. In 2017 and 2018, NCWRC staff worked with Duke Energy biologists to couple hydroacoustic and gill-net surveys to evaluate this unique fishery. Experimental stockings of Kokanee in Lake Nantahala occurred between 2020–2024 and will be monitored via gill-net collections and angler observations. Currently, no Kokanee have been collected in NCWRC sampling efforts, and the last angler-reported catch was in 2019. It is important to note that the Kokanee Salmon stocking in Lake Nantahala is a temporary deviation from our cold-water fisheries management program, which typically focuses exclusively on Brook Trout, Brown

Trout, and Rainbow Trout; therefore, we will not consider stocking Kokanee Salmon in any other water bodies. Our intent for these experimental Kokanee Salmon stockings is to restore the historic population in Nantahala Reservoir and not to expand the range of Kokanee Salmon in North Carolina waters.

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, a sticker was developed to promote the trout page via a QR code. Although distribution has focused on outfitters, the sticker has been extremely popular with anglers and non-anglers.

Habitat Enhancement

The NCWRC is actively engaged with partners to identify and initiate coldwater habitat enhancement projects. Efforts span the range of trout distribution in North Carolina, which includes waters on public and private lands. Additionally, staff have initiated projects to evaluate the efficacy of a rubberized fish ladder (Flexi-Baffles) to improve passage within native Brook Trout populations. Habitat enhancement activities remain a key aspect of trout management in the state.

Eastern Brook Trout Joint Venture

NCWRC has continued to be actively involved with the Eastern Brook Trout Joint Venture (EBTJV). Jake Rash serves as North Carolina's State Representative on the Steering Committee and Chair of the Steering Committee.

South Carolina

Submitted by Dan Rankin

- Staffing level is the best it has been in my career. We now have an assistant coordinator and 2 assistant federal aid biologists on staff. We also have a temporary grant biologist working on a brook trout restoration and creel survey projects.

- Brook Trout restoration on Pigpen Branch and Licklog Creek was conducted 2023-24. This is a big partnership project with DNR, Naturaland Trust, USFWS, USFS, GSMNP, Clemson University and others. A pond dam on the head of Pigpen Br. was removed. Antimycin application to remove non-native fishes was conducted in Fall 2023. A remnant genetically distinct population of brook trout (approximately 100 individuals) was collected and translocated to Walhalla State Fish Hatchery and spawned. Fifty-five fingerlings were stocked back in the stream in fall 2024. This distinct native genotype is only known to occur in two streams.

- Brook trout restoration preliminary efforts started on Emory Creek on DNR's Jocassee Gorges property. This project will involve removal in about 2 miles of the stream downstream of an existing brook trout population. Plans are to attempt restoration through electrofishing removals, unless antimycin becomes available in the next year. A request for EBTJV funding for this project along with restoration in 3 other streams: Wrights, Dogwood and Emory Creeks was submitted in 2024.

- Continuing wild fish health surveys working with Ash Bullard's Lab at Auburn. We did document *Myxobolus* for the first time in wild trout in the state. Working to archive historic trout data and starting to update management plans.

- One of those major plan efforts is Chattooga River. Durniak (GADNR), Geddings (SCDNR) and Seehorn (USFS) started annual representative reach monitoring (3-pass depletion) in the upper 12+ miles of Chattooga in the 1980's. While this sampling has produced much more information than we ever had to manage, it still has its limitations to address the status of the wild trout population. The main problem is the representative reaches are not representative, especially for deep pools. The lower 3+ miles of the East Fork Chattooga in SC and the upper 8+ miles of the north fork Chattooga along the boundary of GA and SC has historically produced a unique fishery for quality wild brown trout. These surveys indicate a decline over time in quality brown trout (over 15 inches). We plan to target wild brown trout in coming supplemental surveys to obtain population dynamics data for this unique fishery.

- Proposed renovation to Walhalla Trout Hatchery (approx. 10 million) was funded in 2023-24. The hatchery was built in the 1930's and needs major renovation. This is our only trout hatchery which produces about 750,000-1 million trout per year.

- Some TU members are pushing to add another coldwater trout hatchery in SC. Need for increased trout production to grow hatchery-supported program into the future (ex. expand delayed harvest program, expand Lower Saluda Tailwater stocking, land acquisition in the mountains=more area to stock, expand winter pond/lake stocking). Would be nice but no extra funding to implement at this time.

- Lower Saluda River – Recently completed a study of abundance, growth and mortality. Regulation changes were made to a shoal area where rainbow trout are known to spawn. This area was placed under catch-and-release regulations. Like TN, working to evaluate the relative contribution of wild and stocked fingerling and catchable trout. Tailwater fishery is down now due to an unscheduled maintenance drawdown in summer by Dominion.

- Lake Jocassee – Spent considerable time and energy on Bad Creek PSS FERC relicensing. BCPSS draws water from Lake Jocassee, our trophy trout two-story fishery. Duke Energy is proposing to install a new tunnel and extra powerhouse, which will increase pumpback capability, and make this project the highest rated megawatt pumped storage facility in the nation. We reviewed impacts on fish entrainment, water quality, etc. as part of the integrated Licensing Process. We revived an old study on the evaluation of growth and survival of triploid vs diploid trout in Jocassee. The initial study was inconclusive with mixed results.

- Planned for a telemetry study of recently stocked brown trout in Lake Jocassee to assess early post-stocking survival rates.

- We worked on three major trout stream restoration efforts. Two 1,000+ feet long segments on North Saluda River are in the plans in partnership with Greenville Water System and Naturaland Trust. GWS installed a deepwater automated release system at 130 ft. depth in the reservoir just upstream. This has resulted in very cold temps and well oxygenated water for several miles downstream. There is an active effort to acquire riparian habitat for access and stream restoration. The stream restoration efforts are needed to restore poor land use (primarily commercial farming). The third is a 900 ft+ segment on Eastatoee Creek.

- Focused a lot on land acquisition along the South and North Saluda Rivers where Greenville Water System has recently installed automated deep-water outlets on

headwater water supply reservoirs. Initial temperature studies indicate we will have year around trout temps for several miles in both streams. Conducting temperature monitoring on these streams now. Hoping to piece together enough contiguous reaches to add some special reg waters in the near future. We have 5 DH areas in SC, but none in Greenville County near our largest population center. We would like to incrementally add at least 2 in that area in the future.

- Planned to repeat our stocked trout stream creel survey we did a couple of decades ago. It is the Malvestuto-style roving survey in the “front-country.”

Tennessee

Submitted by Jim Habera

1. *Native Brook Trout*:

    - Rainbow Trout removal completed in Right Prong Rock Creek (Nolichucky River watershed); native Brook Trout produced by TNACI to be released in May 2024 (from Phillips Hollow broodstock—via NC).
    - Translocated 300 native Brook Trout from three GSMNP streams (partnership with NPS, USFS, and TU) to Little Paint Creek (French Broad River watershed) in September 2023; will check for reproduction during summer 2024.
    - Will evaluate development of several recently-restored native Brook Trout populations during 2024 and begin a new distribution survey. Completed >10 miles of native Brook Trout restoration since 2017 and are on target to exceed our goal of 13-15 miles by 2027 per our native Brook Trout management plan.
    - Reintroduced native Brook Trout via propagated fish (TN Aquarium Conservation Institute and Tellico State Trout Hatchery) four South Cherokee National Forest streams within the Little TN River watershed (Ike Camp, Sugar Cove, N. Fork Citico and Big Oak creeks). Plan to work with GSMNP fisheries staff to restore S. Cherokee National Forest streams with native Brook Trout via chemical removal of Rainbow Trout.
    - Developed a statewide online Brook Trout angler survey for distribution (stratified random sample) in 2024. Purpose is to acquire information on how much use and harvest are directed at these fish and which streams are most popular, along with angler opinions on current threats and management.

2. *Tailwater trout fisheries*:

    - All stocking of Rainbow Trout fingerlings in five east TN (Region 4) tailwaters has been suspended as the result of recently-completed or ongoing assessments. Substantial natural reproduction by Rainbow Trout is occurring in three of these tailwaters and recruitment of stocked adult Rainbow Trout is the most important driver of the other.
    - Developing a cooperative effort with Tyler Hern (USFWS) and TU (Trout Unlimited) identify (genetically) what strains of Rainbow Trout are reproducing, recruiting into the 'slot', and into angler creels. A lot of literature involving behavior in the hatchery with different strains, but limited data on performance post-stocking. Now stock ARD, EED, WVD, but previously others (e.g., Shasta).
    - Stocked 7k 10 in. Cutthroat Trout at three tailwater locations during fall 2023. These were Yellowstones instead of the Snake River Finespots stocked in 2021. Now have Bear River/Bear Lake strain fish in our Flintville hatchery for stocking later during fall 2024. State record currently stands at 4 lbs. 12 oz. from the Boone TW (10-year-old angler).
    - Expanded the S. Holston tailwater 16-22" PLR ('slot limit') to include Boone Reservoir (effective March 2024) to protect large Brown Trout that use the habitat and forage present there. May further expand this regulation to include the Wilbur tailwater

(Watauga River), thus making trout regulations for the entire system consistent; Wilbur tailwater angler opinion regarding such a change is being recorded during the 2024 creel survey.

- Established a 16-22" PLR ('slot limit') for Rainbow and Brown Trout in the Boone tailwater. This tailwater consistently produces some of the largest trout in the region and some additional protection for these fish was warranted.
- TWRA staff provided a review of the new USACE EA utilizing years of fishery, angler, and water quality monitoring data for the Caney Fork River (Center Hill Tailwater). USACE also received 800+ public comments voicing environmental/ fishery concerns over the USACE's selected operating alternative. USACE ultimately selected a different operating alternative in the final EA that "best balances" environmental benefits and other project purposes. A Tennessee Tech University graduate student beginning summer 2024 to evaluate Striped Bass predation on stocked trout.
- A year-long creel survey was conducted on the Hiwassee River (Apalachia tailwater), including delayed harvest season. The 2005 trout fishery management plan for this tailwater is being revised and TWRA hosted a public meeting soliciting stakeholder input (~50 attendees) that was well-received. The public meeting was followed up with an online angler survey soliciting more input (586 responses)
- TWRA is partnering with USACE, NGOs, and local government to improve ADA compliant fishing access and build a fishing trail along the Obey River (Dale Hollow tailwater).
- TWRA Region 2 streams personnel are conducting A creel survey is underway (April to October 2024) on the Elk River (Tims Ford tailwater). This is the TWRA Region 2 tailwater currently capable of holding trout year round. A specific goal is to gauge angler satisfaction on the current Brown Trout regulations (daily creel limit one over 20 inches), as recent sampling data indicate the numbers Brown Trout >20 inches may be in decline. This information will be incorporated into the Tims Ford Tailwater management plan to be completed in 2025.

3. *Stocked trout fisheries*

- TWRA Region 2 continues to monitor angler effort of trout stocking sites using trail cameras. Stonebridge Park and Cowan City Park were monitored in 2023 and Big Rock Greenway was monitored in 2024. All had moderate – moderately low use and given the low number of trout currently stocked at these locations, no adjustments were indicated.

Texas

Submitted by Patrick Ireland

Texas Parks and Wildlife Department's Inland Fisheries Division (TPWD) launched two statewide trout evaluation projects in 2024 to assess the performance of stocked trout fisheries across Texas.

1. Neighborhood Fishing Program (NFP) Evaluation
The first project focuses on evaluating the stocking of Rainbow Trout in the 18 Neighborhood Fishing Ponds (NFP) statewide. Key objectives of this evaluation include:

- Assessing the success of the NFP in terms of child participation rates and fostering new anglers.
- Analyzing NFP angling participation, catch rates, and harvest data to optimize fish stocking schedules.
- Using success percentage as an index to evaluate angler catch rates.
- Gauging angler expectations for stocked fish catch and harvest.
- Understanding angler motivations, behaviors, and barriers to fishing, with the goal of refining the NFP offerings to increase engagement and encourage the purchase of future fishing licenses.
- Comparing angler utilization, catch, harvest, and satisfaction between lakes stocked monthly with Rainbow Trout and those stocked bi-weekly. These results will be compared to data from previous NFP evaluations at the same program lakes.
- Evaluating cormorant activity at NFP lakes and assessing whether its impact varies by lake, stocking schedule, and season.

2. Community Fishing Lakes (CFLs) Evaluation
The second ongoing project (started in 2024) focuses on a broader range of lakes, specifically the approximately 140 Community Fishing Lakes (CFLs) across the state. This evaluation examines similar criteria, including angler participation, catch, harvest, and overall satisfaction, to further assess the impact of trout stocking in these community-oriented environments.

Both projects aim to refine stocking strategies, improve angler experiences, and enhance the long-term sustainability of trout fisheries in Texas.

Virginia

Submitted by Brad Fink (VADWR)

Stocked Trout

Stocked Trout Angler Creel Survey

VDWR plans to conduct an angler creel survey on stocked trout waters in 2024 and 2025 to gather information and update Virginia's Stocked Trout Management Plan. VDWR continues to implement the strategies in the current management plan to reach the objectives and goals presented in the plan. https://dwr.virginia.gov/fishing/trout/stocked-trout-management-plan/

Tiger Trout

Virginia began raising Tiger Trout in Coursey Springs Hatchery in spring of 2021 to determine their growth and survival in the hatchery compared to other species. Tiger Trout survived and grew better than Rainbow Trout and will most likely become a constant product of the hatchery. The initial goal was hatchery oriented, but it created a large buzz among anglers as well. Anglers seems to be pleased with the Tiger Trout that have been stocked since 2021.

Wild Trout

eDNA

The VDWR conducted eDNA sampling for Brook Trout in conjunction with USFS in 2019 and 2020. We sampled 85 streams to determine presence/absence of Brook Trout.

"Investigating the Use of eDNA Monitoring to Improve Management of Wild Brook Trout in Virginia."

Abstract was accepted by Wild Trout 2022 and presented by Steve Reeser at the meeting in August of 2022.

Reintroductions

DWR is looking into reintroducing trout into five streams over the next two years thought to be extirpated of Brook Trout. These streams originally had Brook Trout prior to 1990 but have not

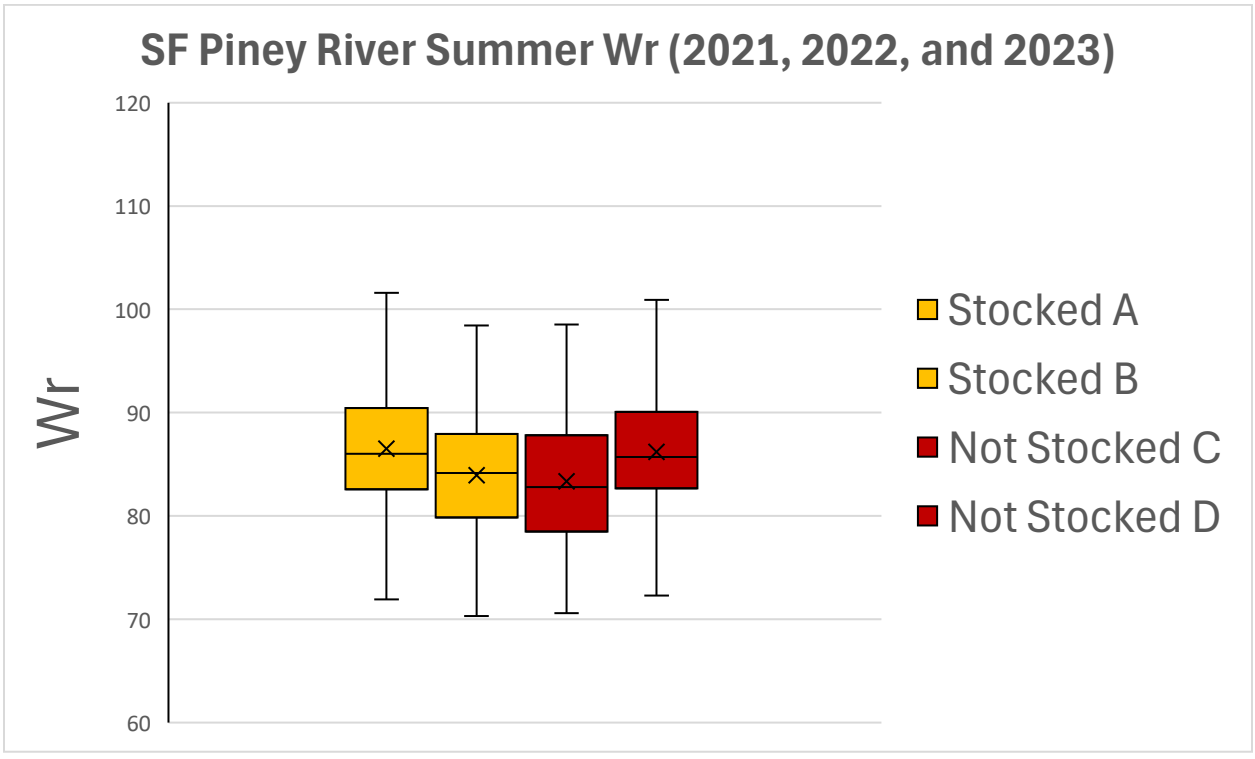
had a positive eDNA or electrofishing sample results since. Limiting factors including temperature, pH, etc. will be examined prior to transporting fish from a nearby source.

Most recent reintroduction in Passage Creek: https://www.youtube.com/watch?v=qrKnzZ2UI1M

Impact of Stocking Hatchery Trout over Wild Brook Trout

In 2021, 2022 and 2023 we sampled multiple locations on five streams to determine the possible impacts to wild trout populations. Dry River, North River (Shenandoah Valley), Helton Creek, Fox Creek (Southwest VA) and South Fork Piney River (East Blue Ridge) were sampled. Three of the streams had four sites sampled and two had six sites. On streams with four sites, two were within the stocked section and two were not. A similar approach was taken on the streams with six sites. These samples were collected in late July and early August in 2021, 2022 and 2023. We also sampled in May of 2022 and 2023 in stocked and unstocked sections of the five streams. Otoliths were collected near each sample site in August of 2022. Results of catch rate and relative weights indicate no impacts to the wild populations.

Figure below indicates general results on all five streams (Spring and Summer)



Wild Fish Health Sampling

We are continuing our fish health sampling efforts in wild Brook Trout streams. VDWR Regions II, III and IV have been choosing two wild trout streams each year and sending samples to the Lamar Fish Health Center in Lamar, PA for analysis. Streams were initially chosen based on fishing pressure and popularity, since these streams are visited more often. Recently we have sampled less popular streams to continue collecting baseline health data statewide.

Wild Trout Sampling – Monitoring

VDWR strives to determine the spatial distribution of all wild trout populations in Virginia to the catchment level every 7 years. We conduct fish surveys on each wild trout stream in the VDWR Coldwater Stream Database every 5 to 7 years by backpack electrofishing or eDNA analysis.

VDWR conducts standardized population assessments on 32 selected streams annually. This effort began in 2014 and continues to collect long-term dataset on these streams. A subcommittee of VDWR's Coldwater Science Team is tasked with monitoring, analyzing and reporting the results of this effort.

Brown Trout Introduction Impacts on Wild Brook Trout

"Trends in Biomass and Relative Weight of Brook Trout in Response to Introduction of Non-native Brown Trout in an Appalachian Mountain Stream" ….. Publication in the 2021 Journal of SEAFWA. Virginia is monitoring streams with wild Brook Trout and Brown Trout coexisting and have not seen Brown Trout overtake Brook Trout. Other streams will be added for analysis as long-term datasets become available.

AOP Training and Assessments

In June of 2021 multiple DWR biologists and staff received AOP assessment training for North Atlantic Aquatic Connectivity Collaboration (NAACC). Recently there has been an effort to complete the Southeast Aquatic Resource Partnership (SARP) training. Trout Unlimited in Virginia had taken the initiative to assess crossings on wild trout streams with the VDWR Complementary Work Force program (volunteer program) with the SARP protocol.

Outreach

Facebook / Youtube

Have been putting videos, etc., on social media about stocked and wild trout management and fishing to engage with the public.

Trout Slam

VDWR launched a marketing campaign called the Virginia Trout Slam. Anglers can catch all 3 species in one day, take pictures and send it in, the angler will get a bumper sticker. Over 100 people did it the first year. This program was supported by publicizing the stocking of all three species in waterbodies and it was successful. More information here https://dwr.virginia.gov/fishing/virginia-trout-slam-challenge/

Saving Private Stocked Trout Waters

Bringing community members together to clean private waters has retained fishing access on stocked trout waters in Shenandoah County. Individuals from other stocked trout waters attended the 2023 and 2024 cleanup event in March to get ideas for their own cleanup days. See 2023 video on Youtube here: https://www.youtube.com/watch?v=McnEppTzw5c

West Virginia

Submitted by David Thorne (WVDNR)

2023 West Virginia Trout Programs Accomplishments

- Stream Surveys – 114 Coldwater assessments for occupancy, population, and AOP issues
- All native Brook Trout were clipped for genetics assessment
- Trout Unlimited and US Forest Service Scientific Collection Permit data incorporated into existing Stream Survey database
- At least seven new waters have been added to the State B-2 Trout Waters list for regulatory protections. None of these were unknown, they just have never been formally surveyed and documented.
- Temperature data on 42 streams, some paired air/water for climate adaptability applications
- AOP evaluations – working with partners to identify AOP issues and opportunities. Partners include USFWS, USFS, WVDOH, Friends of the Cheat, DNR, Division of Forestry, TU, Weyerhaeuser.
- WVU habitat works agreement in 3rd year – 1 ½ miles completed with large wood treatments in Beaver Creek (Shavers Fork) for native Brook Trout similar to recent projects. ~1/2 mile in Milligan Creek (wild Brown Trout FFO stream) on private land in a cooperative project with a local TU Chapter Embrace-A-Stream grant. Milligan Creek is more like a restoration of dimension, pattern, and profile than anything we have attempted before. It was a good learning experience for the team. There is still more that can be accomplished there and a cooperative landowner there is working on DNR's behalf to engage adjacent landowners.
- Army Corps of Engineers cooperative project in Kumbrabow State Forest to replace a vented culvert crossing to a campground. AOP barrier on Mill Creek, an intact Brook Trout HUC12.
- Recent workshop to engage private commercial forest owners/managers to partner on conservation projects – instream, riparian, AOP, roads, sedimentation plans, etc. Organized with the North American Forestry Operators association.
- Limestone sand program continues – working on a sustainability plan. Recent challenges with supply and inflation have highlighted a need to create a long-term plan with alternatives, not just for cost-effectiveness, but for continuity. Any substantial lapse in the program could have major implications for the persistence of some populations at the current level.
- Red Creek headwaters outside Dolly Sods Wilderness now has a repeatable action plan to get limestone sand into those waters via a private, but very difficult, access "road". We will continue to partner with the landowner to continually improve management access while attempting to limit unnecessary access due to the sensitivity of the ecosystem. This access allows us to treat Red Creek mainstem through the entire Dolly Sods Wilderness Area, creating over 11 miles of very high-quality habitat for the improvement of the limited, but high potential, Brook Trout population there. We continue working with USFWS Canaan Valley National Wildlife Refuge and the Monongahela National Forest to gain access into another tributary to connect an additional 4 miles of high-quality habitat if we can improve the pH.

- Research – 4 Brook Trout projects ongoing plus a new project to identify occurrence of Candy Darters in the diet of stocked trout – FWS needs for Section 7 evaluation of trout stocking program
- Hatchery/Stocked Trout Program – Bowden Hatchery upgrades helping increase production of stocked trout; expected catchable increase of 10% for the season.
- Cooperative Brown Trout fingerling program with Trout Unlimited Chapters
- Gold Rush stocking remains popular with anglers and is expected to continue each April