Minutes of the Trout Committee of the Southern Division American Fisheries Society Meeting
Meeting convened on Tuesday, May 17, 2022, at Graves Mountain Lodge in Syria, VA

The 2022 meeting of the Southern Division of the American Fisheries Society Trout Committee was called to order at 9:00 AM EST by Sally Petre, the committee chair. The following members and guests were in attendance: *(In-Person)* – Brad Fink (VA), Steve Reeser (VA), David Thorne (WV), Larry Mohn (Shenandoah Stream Works), Jim Habera (TN), Sally Petre (TN), Yoikiro Kanno (CSU) & Lucy Lu (CSU), Joseph Kaiser (AR), Jake Rash (NC), Dan Rankin (SC), Sarah Baker (GA), Matt Lawrence (MD), Seth Coffman (TU)
(Virtual) – Christy Graham (AR), Matt Kulp (GSMNP), Matt Sell (MD), Danci Johnston (KY), Brandon Simcox (TN)

Following introductions of all those present, Sally Petre addressed general housekeeping items including extending thanks to Steve Reeser & Brad Fink for organizing and hosting the meeting venue.

Sally Petre determined that the required quorum of ten voting members was present.

Old Business

Approval of 2021 Minutes: Sally Petre sent the 2021 meeting minutes out to members via email. Jim Habera motioned to pass minutes, Brad Fink seconded, and the motion passed. The approved 2021 meeting minutes were to be posted to the Committee's website by Jim Habera.

Treasurer's Report: Treasurer Christy Graham (AR) reported on the Committee's financial status as of May 17th, 2022. Balance of last year - $6,152.83. Current balance - $6,060.33. Only one expense (plaque) was made. Matt Kulp motioned to accept treasurer report. Brad Fink seconded, and the motion passed.

Membership List Update: Sally Petre passed around the current membership list and asked attendees to review and update the list to including everyone's correct contact information. The list will be posted on the website after the meeting by Jim Habera.

Website Update: Jim Habera provided a brief update on the Committee's website (https://units.fisheries.org/sdafstroutcommittee/). It is up to date through last year's meeting, including a proceedings document summarizing each annual meeting. Everyone should check the membership page for accuracy. Habera asked that photos for the website be sent to him.

MicroFish Update: Jack Van Deventer was unable to attend, however sent in the following update on the successfulness of MicroFish:
Since the overhaul of the MicroFish.org website, the number of downloads has increased tremendously. We've added 10 new countries to the list of MicroFish users, bringing the total to 82 countries. The latest countries or territories to start using MicroFish include Lebanon, Panama, the Republic of Georgia, Greece, Myanmar, Afghanistan, Hong Kong, Ukraine, Guatemala, Paraguay, and Puerto Rico. The downloads have been heaviest from Iran, Iraq, Brazil, and Norway. (I can't explain what the nature of fisheries research is in some of these countries.)
There is one more forthcoming version of MicroFish, which will be the final version. I want to thank the Trout Committee for the distinguished service recognition. It was a tremendous blessing to me and a reminder of decades of partnerships and excellent friendships within the fisheries community. Thank you for your kindness.

New Business

Nomination and Election of New Trout Committee Officers for 2023-2024: Chair-elect Sarah Baker will become the new Chair following the meeting. A motion nominating Matt Lawrence of Maryland DNR to be the Chair-elect for 2023-2024 was made by Matt Sell. Brad Fink seconded and the motion, and the motion was approved unanimously. Christy Graham nominated herself to be the treasurer for 2023-2024. Sally Petre seconded and the motion was unanimously passed.

2023-2024 Officers
Chair: Sarah Baker (Georgia)
Chair-elect: Matt Lawrence (Maryland)
Past Chair: Sally Petre (Tennessee)
Treasurer: Christy Graham (Arkansas)

2023 Trout Committee Meeting: The committee discussed potential location options for the 2023 Trout Committee Meeting**.** Steve Reeser motioned that the meeting should take place in Norris, Tennessee, at Norris Dam State Park or near the South Holston tailwater in Tennessee, on a Monday, Tuesday, Wednesday in May based on availability of facility location (May 15-17 or 22-24). David Thorne seconded the motion, and the motion passed.

Steve Reeser motioned that travel funds be provided for trout committee members to attend committee meetings on an as needed, as requested basis, if funds can support it. The executive committee makes decision on fund distribution. Discussion was had about where the committee received its income. Primarily, funding is from the East Coast Trout Meeting which will likely take place again in 2024. Larry Mohn seconded the motion and the motion passed.

Workshops/Trainings Hosted by Trout Committee: Excel & Microfish training may be hosted by Jack Van Deventer at the 2023 Trout Committee meeting OR at the 2024 SDAFS meeting.

Distinguished Service Award:
Jim Habera proudly acknowledges **Matt Sell** for his 10 years of service on the Trout Committee, serving as chair twice (2013 and 2014) and organizing East Coast 6 back in 2019. Congratulations Matt!

Update Trout Committee Procedural Document: Sally Petre introduced the need for changes to be made to the Trout Committee Procedural document which was last updated in 2005. The Division has a procedural document that was updated in 2019. The Trout Committee procedural document needs to align with the Division's document. Sally Petre motioned that her proposed changes to the Trout Committee Procedural Document be accepted as follows:

1) Changing "*SDAFS*" to "*Division*" in accordance with the Division Procedural Document
2) Change minimum number of voting members present from 10 to 5.
3) Added "*including the chair, or the chair's proxy*" to 4) a) when defining quorum.
4) Changed verbiage in 5)a) to be consistent with Division Procedural document.
5) Change 6)ix) to read "*Chair-Elect/Secretary and Treasurer*" instead of "*Chair-Elect and Secretary/Treasurer*" as stated in Division Procedural Document. This will make it in line with how the positions are set up.
6) Removed the word "*Secretary*" from 6)b)vii)

7) Added duty to 6)c)iv) *"iv) All Committees must prepare a year-end financial balance report (Assets and Liabilities) and forward to the Division Secretary-Treasurer by the end of February. See Appendix IV of the Division Procedural Manual for format."*
8) Removed 8) and 9)
    a. These included "recent" accomplishments, which we have on our website; current accomplishments and contact information. All of which are fluid and should be updated readily on our website.

9) Add duties of "Past-Chair" including Participate in meeting planning when needed; complete change of officer form;
    a. Remove the following from Chair-Elect/Secretary and add to "Past-Chair": *vi) Assists the Chairperson as needed to ensure the smooth and efficient operation of Committee activities. Takes a lead role in planning and organization of special workshops and symposia.*

- Larry Mohn motioned to amend the change in the new Division's listed quorum from 5 back to 10. Jim Habera seconded the motion, and the motion passed.
- Jim Habera motioned to strike the word "secretary" within our document as we do not have a secretary because the chair-elect records meeting minutes. David Thorne seconded the motion, and the motion passed.
- David Thorne seconded Sally Petre's motion to change the Trout Committee Procedural Document with above amendments, and the motion passed.

Formation of Brook Trout Subcommittee: Sally Petre suggested forming a Brook Trout Subcommittee to provide an updated Position Statement since the 2005 featured publication in Fisheries – *Managing Southern Brook Trout: A Position Statement*. Updates could include recent genetic results, allelic diversity, taxonomic status, distribution, population dynamics, and climate impact. Members of the trout committee agreed with the need for the subcommittee. Jim Habera, Matt Kulp, & Jacob Rash will co-chair the subcommittee.

Presentations

Dr. Lucy Lu and Dr. Yoichiro Kanno – "Synthesis and analysis of trout and environmental data in the Southeastern USA": Update focused on flow & temperatures
Processed a total of 3,500 sites; 750,000 trout individuals; 204 sites paired water temps and air temps from USFS (4-5 years of data on average). Single pass data can be useful with the use of Bayesian Analyses. Potential preferential sampling can be a downfall when sampling the most populated sites (less trout, less effort). There appears to be positive effects of latitude and elevation on populations, and Negative effects of winter flow. Borrowing information from sites around a stream to make predictions. Hierarchical model provides these data.

Questions to Consider: Would it be possible that we make trout datasets publicly available down the road (1-2 years from now)? What creates spatial synchrony and asynchrony? Which sites are more synchronous than others?
More stable temp regimes due to ground water presence? Can landscape variables predict thermal buffering of stream temperature?

LUNCH – *The committee reconvened after lunch.*

R3 Presentations:

Brandon Simcox – Tennessee's R3
Trout Angler Survey
Community Fishing Program – Urban to smaller cities to rural; Looking at population growth by county to focus efforts
Update fishing forecast quarterly – uploaded videos
Trout Fishing Social Media Campaign from April 1 through May 10 generated 5000 new $848 spent on campaign $29.13 return on ad spend $1.42 cost per license purchase
Number one way of getting info – word of mouth friends. #2 = fly shops and bait shops – important for agencies to make good connections

Joseph Kaiser – AGFC's R3 action Plan: Emphasis on Fishing
R3 Fishing Action Team = education, enforcement, admin, fisheries meet quarterly (diverse implementation team)
30+ ponds stocked with trout during fall and winter
Tagged trout win a prize!
Virtual webinars workshops, programs and classes
Video posts get higher engagement rate
License vendor and event manager need to be compatible with one another

Sarah Baker – Supporting Female Anglers
Hosting events to encourage female participants

Larry Mohn moves to adjourn the meeting at 4:30. Brad Fink seconds the motion and the motion Passed unanimously.

Round Table Notes

Arkansas

Submitted by Joseph Kaiser (AGFC)

Renovations at the Jim Hinkle Spring River State Fish Hatchery are underway. The hatchery has old metal fish silos from back before our agency inherited the facility that have since rusted out. Also, the hatchery is positive for IPN. Circular fiberglass tanks are being installed that will increase fish production and help with biosecurity at the hatchery.

The Arkansas Game and Fish Commission (AGFC) Trout Management Program (TMP) has conducted a number of activities over the last year with regard to stocking, monitoring, and research. The TMP has recently completed a year-long creel survey on the Greers Ferry Tailwater and started a year-long survey on the Bull Shoals and Norfork tailwaters starting this past September. The results from those surveys will be important to determine whether decreased stocking rates of Rainbow Trout from 2015-2017 have had a negative impact on angler catch rates on the fisheries. Currently, over 1,500 angler interviews have been conducted between Bull Shoals and Norfork tailwaters.

A study conducted by Missouri State University evaluated delayed hooking mortality for Rainbow Trout on Bull Shoals and Norfork tailwaters. Rainbow Trout were caught with various tackle combinations (i.e., different hook types, artificial, baited), and fish were held in pens for 5 days after being captured. Hooking mortality was similar for hook types and seasons, but differed when considering the hooking location (Deep hooking had the highest hooking mortality = 24.03%). Please feel free to reach out to me if you are interested in a recorded presentation of the findings from this study (joseph.kaiser@agfc.ar.gov).

The TMP finalized the first ever management plan for the Spring River Trout fishery in 2021. Results from data collected by the TMP, along with public input solicited during a public workshop, prompted the TMP to propose and implement regulation changes including a regulation to limit harvest of trout over 14 inches to one fish per day. Prior to the regulation change, there were no regulations for Rainbow Trout outside the daily limit of 5 fish. A number of anglers indicated support for a protective regulation in order to improve catch of larger fish, and data from electrofishing surveys indicated few big fish in the Spring River. A Brown Trout growth and survival study is being conducted on Spring River. Data will be used to collect current estimates of survival and growth and to help evaluate the new fishing regulations that were implemented in 2021. The TMP has also been using land use / land cover data from USGS's National Land Cover Database (NLCD) and water quality data from the Arkansas Department of Energy and Environment's Aquaview database to identify sub-basins and mainstem areas with potential sedimentation issues. This data will be used to identify potential areas for habitat and bank stabilization projects and to analyze relationships between land use / land cover, water quality and sportfish population characteristics from TMP monitoring data (2010-2021). The Spring River management plan can be viewed here.

The TMP has been conducting a seasonal tagging study on Dry Run Creek and Norfork Tailwater. The creek runs adjacent to the Norfork National Fish Hatchery (NFNFH) and is well known for being full of

trophy trout. Each season, large Rainbow Trout and all Brown and Cutthroat Trout are being implanted with PIT tags to monitor growth, survival, and movement in Dry Run Creek and Norfork TW. Even though a large number of fish have been tagged between the two systems, very little movement has been observed thus far between Dry Run Creek and Norfork Tailwater.

For the last few years, the TMP has been partnering with the University of Arkansas at Pine Bluff (UAPB) on a Brown Trout spawning study for the Greers Ferry Tailwater. Redd surveys were conducted during the 2019-2020 and 2020-2021 spawning seasons (at two week intervals). Microhabitat characteristics were collected at redd locations throughout the tailwater during the 2019-2020 surveys. Results from redd surveys revealed spawning happens differently each year, but Brown Trout appear to spawn anywhere in the tailwater where microhabitat conditions are right. Microhabitat characteristics closely associated with redd locations on the Greers Ferry Tailwater included median substrate size of 31 mm (range = 2-136 mm), redd depths (mean ± SD) of 340 ± 160 mm, and water velocities of 30 ± 17 cm/s. These characteristics are very similar to those observed in other systems where Brown Trout spawn in the US and abroad. We have also PIT tagged Brown Trout seasonally since Fall 2018. There are two more seasonal (3-4 month interval) tagging events to go, but we are seeing that Brown Trout do not move far from where they were tagged and Brown Trout growth rates are slow in Greers Ferry Tailwater (~1 inch/yr). The final results from the study will be used to understand Brown Trout population dynamics on the Greers Ferry Tailwater and will aid in assessing the efficacy of our current fishing regulations.

The TMP experimentally stocked Tiger Trout (Brown Trout x Brook Trout) in Bull Shoals TW in May 2020. Although we have little information on their survival and growth rates to date, anglers are still catching them in the tailwater including fish that are now being caught at harvestable sizes (24 inches). We will also resume stocking of the Snake River Finespot subspecies of Cutthroat Trout in the Bull Shoals and Norfork tailwaters. For two years, we attempted stocking the Yellowstone subspecies. However, that subspecies experienced poor survival in the hatchery and post-stocking. We also have had golden Rainbow Trout from a private hatchery in Missouri from FEMA money we acquired after major flooding occurred at our state fish hatchery in 2017.

The TMP worked with Dr. Jon Spurgeon at the USGS's Nebraska Cooperative Fish and Wildlife Research Unit with the University of Nebraska – Lincoln and Dr. Steve Lochmann at UAPB to publish a journal article in North American Journal of Fisheries Management. The article is titled 'Trout responses to stocking rates and river discharge within a southeast US hydropeaking tailwater', and will be available soon to view online. This paper analyzed the relationship between relative condition of Brown Trout and Rainbow Trout in the Greers Ferry Tailwater from the TMPs fall monitoring data that's been collected from 2002-2019, changes in mean stocking numbers (2002-2006 = 349,446; 2007-2015 = 260,747; 2016-2019 = 154,384), and dam discharge data for Greers Ferry Dam collected from the USACOE. The top models suggested that trout condition was inversely influenced by the ratio of 20th percentile to 80th percentile of daily discharges within a year (ratio of flow magnitude).

The TMP will be conducting a creel survey on Narrow Tailwater this upcoming fall. This is our southernmost tailwater, and the survey will help us determine if stocking rates, regulations, and other amenities for the tailwater need adjusting or improvements.

Georgia Department of Natural Resources
Roundtable Notes for the 2022 SDAFS Trout Committee Annual Meeting

Report submitted by Sarah Baker

Trout Management Plan Update

- **Last plan from 2001**
    - All regional managers' input on the plan.
    - Updated Plan includes six programs: Wild Trout Management, Habitat Conservation and Enhancement, Management of Hatchery Supported Waters, Hatchery Production Program, Public Relations, Disease Monitoring and Biosecurity
    - Currently in review by headquarters staff. Will update accordingly in response to their comments.

Hatchery Production Program

- **Whirling Disease & IHNV**

  Initial testing results indicate that hatchery-raised Rainbow Trout at the Buford Hatchery tested positive for Whirling Disease (WHD) and Infectious Hematopoietic Necrosis Virus (IHNV). However further testing could not confirm the presence of IHNV. Hatchery-raised Rainbow Trout at the Summerville Hatchery tested positive for *Myxobolus cerebralis*. DNR took immediate action and suspended the stocking of trout. Approximately 800,000 trout were euthanized, transported and buried off-site. Hatcheries were disinfected using hot water pressure washers and bleach solutions over several months. Both hatcheries received fish in early 2022, and all test results since have returned without WHD or IHNV. We scrambled to find trout to grow out at Burton Hatchery; thank you Arkansas and North Carolina private hatcheries for providing fish.

- **Hatchery Renovations**
    - Lake Burton Hatchery renovation is complete, and the hatchery is in operation.
    - Goal of the project was not to increase production but make production more consistent in years of drought or low rainfall and replacing aging infrastructure to last another 50 years. The project included the addition of dual drain circular tanks and the use of bulk liquid oxygen and low head oxygen units at the facility.
    - Reduced trout stocking program by 30% for the 2021 stocking season and will have a similar impact to the 2022 season.
    - Staff are learning how to operate in the renovated facility.
- **Brook Trout stocking**
    - GA program typically focuses on RBT with about 10% BNT
    - Accepted BKT eggs from Walhalla, State Fish Hatchery, SC, as Brook Trout are popular among anglers.
    - Will not stock on or near native Brook Trout populations.
- **Stocking locations**
    - Hatchery staff recorded the number of anglers that they observed at each stocking point during their stocking runs throughout the 2021 stocking season. With limited number of fish due to hatchery renovations and disease outbreak, we needed data on usage in order to make the best use of our fish for our anglers. Data is still be evaluated, however, several sites located on private property that very clearly did not have much angler use were removed from the stocking site list.

Angler Communication

- Weekly blog post by regional biologists on Georgia DNR Wildlife Resources Division website: https://georgiawildlife.blog/category/fishing/
- Trout Stream Interactive Map updated annually with information on accessibility, generation schedule links, regulations, and angling recommendations. https://gadnrwrd.maps.arcgis.com/apps/webappviewer/index.html?id=af50967627004b178ccd7264124fe5fd
- Offering more learn to fish programs geared toward women; including fly-fishing in Becoming and Outdoors Woman programs, working closely with Artemis GA, Trout Fishing With Mom events
- Introducing the Trout Slam in 2023

Disease Prevention:

- Trout from private sellers continue to be sampled and sent to the Southeast Cooperative Fish Parasite & Disease Laboratory (Auburn University Fish Disease Lab/Coop) to be examined for whirling disease and gill lice.
- Since the outbreak of WHD in state fish hatcheries, wild trout from stocked streams have been collected and sent to Auburn to be assessed for WHD. Negative results have returned so far.

Wild Trout Monitoring:

- Georgia DNR continues its efforts to document and evaluate the populations of wild Brook Trout, Brown Trout, and Rainbow Trout. A single file containing all historical records of sampling efforts has been created so as to help managers utilize these records for future analyses. Dr. Yoichiro Kanno and George Valentine have compiled these data for their project.
- Historically sampled streams are in need of being revisited and their records updated. Starting a protocol and rotation of sampling these streams, in addition to our annual standardized sampling streams. Identifying potentially extirpated populations.
- Collaborating with UGA to collect eDNA water samples from those streams that appear devoid of Brook Trout. After confirming disappearance, hopeful for translocation efforts to occur. Need genetic results on more streams.
- Need more public outreach on wild trout conservation efforts being made in Georgia

Toccoa Tailwater Self-Report Creel Survey

- Using a QR code and Survey123 App to collect data from willing anglers at five public access sites along the Toccoa Tailwater. Implementation date TBD.

AOP Training & Assessments using SARP protocol

- Working with TU volunteers to record AOP data on FS properties

Woody Debris Additions to Wild Trout Streams– "Traditional Structures" and Chop-N-Drop

- Stream restoration on Crayfish Creek - Supporting TU's initiative https://crayfishcreek.org/

GRSM 2021 Fisheries Highlights

16 May 2022

Project Updates

1. Anthony Creek Brook Trout Restoration (2.6 km) (Abrams Creek watershed)
    a. Restored with multiple electrofishing removals in 2017 (TWRA assistance)
    b. Translocated 269 brook trout in Sept 2017 from Bunches Creek and additional 237 fish from Deep Creek in 2018 (~130-200 fish/mile).
    c. 2018 recovery looked good; however 2021 monitoring indicates poor 2018, 2019, 2020 YOY production & recruitment
        i. Two flood events in winter/spring of 2019 > 5,000cfs & two in 2020 >10,000cfs measured at downstream locations greatly reduced YOY
        ii. YOY production was down 57-100% 2018-2020
    d. Will assess source stocks and add BKT in 2022
2. Little Cataloochee Creek Restoration (2.8km) (Cataloochee Creek watershed)
    a. Sept 2017 antimycin treatment (NCWRC, NC TU assistance)
    b. Translocated 183 BKT (32 Coggins; 151 Correll Branch) in 2018
    c. All monitoring sites at/above pre-treatment RBT levels in 2021=RECOVERED

    ** TOTAL 13 streams and 30.3 miles of Brook Trout water restored to date*

3. Antimycin Re-Registration
    a. Draft SOP manual submitted to be appended to the label (Rankin [SC DNR], Dave Hering [CRLA], Kulp [GRSM], Teresa Lewis [USFWS])
    b. Have been successful in getting the strain revived and are now working with two groups for large scale production – Covid slowed production down
    c. Goal to submit reregistration packet to EPA in fall 2022; production 2023?

4. 2021-2023 GRSM Trout Distribution Surveys
    a. In 2021, Cheoah funds helped survey NC watersheds near Cheoah/Fontana
    b. Surveyed 83 km in 13 small NC watersheds around Fontana Dam
        i. Only 11.5 km had Rainbow Trout (14%); numerous barriers identified
    c. Potential to restore 11.5 km in Twentymile Creek; restoration prep work in 2022

5. Trout distribution surveys completed in 82% of park to date
        i. Goal to complete additional 5% in 2022 (Eagle Creek, lower Abrams)
        ii. Goal to complete 5% in 2023 (Hazel Creek, Noland, Cooper Creek)
    a. Interesting Distribution Facts:
        iii. Distribution completed in 2,385 of 2,900 miles (82% surveyed)
            1. 476 miles fish (20%); 1,909 miles no fish (80%)
            2. <5% of 1st or 2nd order occupied; >95% 3rd-5th order occupied
                a. Brook occupy 202 miles (42%)
                b. Brown occupy 103 miles (22%)

c. Rainbow occupy 361 miles (76%)

Check out trout distribution data at:
https://nps.maps.arcgis.com/apps/mapviewer/index.html?layers=6384a62a5d9149838b5d0a13a7afc7f0
GRSM Trout Barriers Layer:
https://nps.maps.arcgis.com/apps/mapviewer/index.html?layers=b85eef38ebfd4960be4dd7c8c38f3735

6. UT Study on Genetics of Restored Brook Trout Populations
    a. Focusing on determining how temperature of source stock streams affects genetics of newly established populations over time
    b. Focusing on 6 restored populations and 12 source stocks (some 28 years out)
    c. Installing HOBO's on source streams

7. GRSM scoping a Park Fishing Permit "in lieu of" state license requirement
    a. General agreement with NC & TN Exec Dir's
    b. Working through authorities and possible legislative changes needed

8. TSMP Program project to restore 5.5. miles of streams in Cades Cove (some trout streams) – in lieu of fee program
    a. includes streambank work to moving entire channels

9. AOP Surveys with TU volunteers (Jeff Wright trained)

10. GRSM visitation topped 14.1 million on 2021!
    a. 17% increase since 2021; 57% increase since 2011

11. Comment on Lucy's and Yoichiro's presentations – Yoichiro asked about tool needs
    a. Understood one goal of analyses was ability to use analyses to reduce sampling
    b. Could use a tool to help characterize natural variability of long term monitoring sites and use that to display confidence of scaling back to 1-2 years, 1-3 years, 1-4 years, etc.

12. Steve Moore health concerns

Maryland Department of Natural Resources, Fishing and Boating Services Roundtable Notes for the 2022 SDAFS Trout Committee Annual Meeting Prepared by Matt Lawrence

New staff

Fishing and Boating Services has made several staff changes since the 2021 SDAFS Trout Committee Meeting. Alan Heft retired from his position as Coldwater Fisheries Manager in January of 2021 and Matt Sell vacated the Brook Trout Biologist position to become the Western Region, District 1 Manager in September of 2021. Matt Lawrence was hired in September of 2021 as the new Coldwater Fisheries Manager and Jason Cessna was hired in May of 2022 as the new Brook Trout Biologist.

eDNA

Fishing and Boating Services continued to collaborate with University of Maryland, Center for Environmental Science (UMCES) to develop eDNA methods for detecting the presence of brook trout in Maryland waters. The results from eDNA samples collected in 2021 were inconclusive, so UMCES purchased a new Smith Root eDNA sampler for use in 2022. The eDNA sampler was used to collect samples just below a holding pen that contained brook trout and at 100, 200, 500, and 1000 meters below the holding pen. An additional sample was collected above the holding pen. Treatments included 1, 5, and 10 brook trout. Samples have not yet been processed. Positive results may lead to the use of this tool to detect new populations of brook trout in Maryland.

Brook Trout Reintroductions

Fishing and Boating Services has been collecting habitat, temperature, and aquatic community data from streams that do not currently support brook trout to identify candidates for reintroductions. Metrics generated from the candidate streams were analyzed for brook trout habitat suitability using a Classification and Regression Tree (CART) model. Initial analyses identified three candidate streams that could potentially support brook trout. Fishing and Boating Services is conducting a fish health risk assessment analysis and is waiting for guidance on genetic considerations before proceeding. When these issues have been resolved, brook trout will be transplanted from source populations to the candidate streams. Follow up monitoring will be conducted to determine project success.

Savage River Springs Flow project

The Savage River watershed supports Maryland's largest brook trout population, has a high connectivity, and is predicted to be resilient to climate change. Recent temperature and flow data collection in the watershed has improved Maryland's understanding of the influence of tributaries on the Savage River. The results suggested that the Little Savage River and Poplar Lick Run contribute the greatest amount of coldwater to the Savage River mainstem during low flow conditions. In contrast, Mudlick Run was a major source of warmer water. The outcome of this project led Fishing and Boating Services to pursue a pilot project that would investigate flow

and coldwater contribution from Savage Springs near the City of Frostburg. Savage Springs is as spring source for the Upper Savage River and is one of two sources of public water for Frostburg. Fishing and Boating Services has asked the city to slightly reduce public water withdrawals from Savage Springs during a 12 to 24 hour period during summer low flows to determine flow and coldwater contributions to the Savage River mainstem. If the study is completed and Savage Springs contributes significant coldwater to the Savage River, Fishing and Boating Services will work with the city to determine if alternative water withdrawal strategies are possible. ***Update. The City of Frostburg has decided to oppose this project. They do not believe there is an alternative withdrawal strategy that will work for the city.***

Strategic Woody Additions

Fishing and Boating Services is developing a program that will strategically add woody debris to brook trout streams for habitat enhancement. Staff recently met with Maryland Department of the Environment (MDE) to discuss permitting requirements and identify potential challenges and concerns. The outcome of the meeting identified the need for a pilot project that MDE could review for permitting/regulatory purposes. Fishing and Boating Services has identified Hauver Branch in the Big Hunting Creek watershed and Big Run in the Savage River watershed as potential sites for the pilot project. Site visits will be conducted to select the optimal location and a plan will be developed and submitted to MDE.

Dam Removal Policy Development

Fishing and Boating Services is working with Maryland Department of the Environment to develop a policy and outreach materials for the removal of aging and/or unwanted dams. Removal of these dams in sensitive watersheds may be beneficial for fish passage and may reduce thermal pollution in coldwater streams that support wild trout. Many dams in Maryland are reaching the end of life for functionality and may be out of compliance with regulatory standards. Repairs and renovations can be a considerable expense for landowners. The development of a policy and outreach materials for dam removal will educate landowners on the importance of dam removal under certain circumstances, provide guidance for best management practices, and inform landowners of opportunities for support.

AMD Mitigation

Fishing and Boating Services is working with Maryland Department of the Environment, Abandoned Mine Lands Division to prioritize AMD impacted streams for mitigation. The Abandoned Mind Lands Division is receiving a considerable increase in funding resources due to increased spending on infrastructure. There are many AMD impacted streams in western Maryland that have the temperature regime to support wild trout populations but do not have suitable water quality. Fishing and Boating Services is providing data to direct mitigation resources to streams in watersheds that support wild trout or to streams that could be candidates for reintroduction efforts if water quality is improved.

Coldwater Fisheries Advisory Committee

Fishing and Boating Services convened the first meeting of Maryland's Coldwater Fisheries Advisory Committee in January of 2022. The committee was appointed by Maryland's Sport Fish Advisory Commission. The committee has 13 members that are interested and active in coldwater fisheries management and protection. The committee will discuss coldwater fisheries issues and provide guidance and recommendations to the Sport Fish Advisory Commission.

North Carolina Wildlife Resources Commission
Update to the Southern Division of the American Fisheries Society Trout Committee
2022 Annual Meeting
Graves Mountain Lodge
Syria, VA
16–18 May 2022

Report submitted by Jake Rash

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 2022, research will focus on the oligochaete hosts of *Mc*. 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.

Trout Angling Access Working Group

Sufficient public access for trout angling remains a major challenge for anglers in North Carolina, while finding ways to ensure long-term viability of public access is cited routinely by anglers and NCWRC staff as a priority issue. As such, staff have been working on possible solutions for many years, but momentum is building inside and outside of the agency for real

solutions to this critical issue. In 2019, the NCWRC began engaging a small group of key stakeholders through the creation of a Trout Angling Access Working Group to develop a collaborative and sustained approach to address the issue.

Identification of Natural Barriers

Thanks to numerous efforts throughout the years, identification of anthropogenic barriers to aquatic organism passage in high-elevation waters of North Carolina is fairly robust. However, the same cannot be said relative to identification and documentation of barriers that occur naturally. The NCWRC has been working with biologist at the Southeast Aquatic Resources Partnership (SARP) and North Carolina Geological Survey to develop geospatial methodologies to help identify these features, which are critical to Brook Trout conservation. This effort is challenging, but the project is ongoing and holds promise.

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, the majority of populations show limited evidence of introgression by northern origin hatchery strains. Since 2016, additional Brook Trout have been examined, and approximately 500 additional individuals will be processed annually. These results represent a valuable information for management and restoration efforts of Brook Trout in North Carolina. Relevant publications since previous Trout Committee update:

Kazyak, D. C., B. A. Lubinski, M. A. Kulp, K. C. Pregler, A. R. Whiteley, E. Hallerman, J. A. Coombs, Y. Kanno, J. M. Rash, R. P. Morgan II, J. Habera, J. Henegar, T. C. Weathers, M. T. Sell, A. Rabern, D. Rankin, T. L. King. 2022. Population genetics of Brook Trout in the southern Appalachian Mountains. Transactions of the American Fisheries Society 151:127–149.

White, S. L., D. C. Kazyak, R. C. Harrington, M. A. Kulp, J. M. Rash, T. C. Weathers, and T. J. Near. 2021. Phenotypic variation in Brook Trout *Salvelinus fontinalis* (Mitchill) at broad spatial scales makes morphology an insufficient basis for taxonomic reclassification of the species. Ichthyology & Herpetology 109:743–752.

Brook Trout Restoration

The NCWRC has used recent genetic data to plan Brook Trout restoration activities. We have worked with partners to conduct 17 projects during the last 15 years via the translocation of fish from selected source populations. Additional restorations are planned for 2022. Relevant publications since previous Trout Committee update:

White, S. J., T. C. Johnson, J. M. Rash, B. A. Lubinski, and D. C. Kazyak. (2022). Using genetic data to advance stream fish reintroduction science: a case study in brook trout. Restoration Ecology [online early].

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. Unfortunately, this program was paused in winter 2021 following catastrophic flooding at the Bobby N. Setzer State Fish Hatchery; however, it is slated to return in 2022.

General Aquatic Nuisance Species

The NCWRC has developed 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 will have a two-person crew focused on these collection efforts.

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.

Lake Nantahala Kokanee Salmon Population

Kokanee Salmon *Oncorhynchus nerka* were stocked in western North Carolina reservoirs during the early 1960s, but Lake Nantahala was only system that successfully produced a self-sustaining population that persists today. In 2014, the state record fish (4 lb and 1 oz) was caught, but since that time angler have been reporting 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. Staff have developed an ArcGIS Survey123 project to allow anglers to collect real-time information relative to their catches from Lake Nantahala and its Kokanee population. An experimental stocking of Kokanee in Lake Nantahala occurred in 2020 and will be monitored via gill-net collections and angler observations (Survey 123 project noted above). 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.

Long-term Performance of VIE

Located near the Tennessee-North Carolina border, Apalachia Reservoir maintains suitable trout habitat throughout the year. In 2012, the WRC initiated a multi-year project to evaluate the best size and species of trout to create a trophy put-grow-and-take fishery in the reservoir, and today, the impoundment is classified as Special Regulation Trout Waters. Although the initial research project has concluded, we utilized the project's fish-marking data to evaluate retention of visible implant elastomer (VIE) in the Brown Trout *Salmo trutta* and Rainbow Trout *Oncorhynchus mykiss* stockings. The long-term performance of VIE guided management recommendations for the new Apalachia Reservoir fishery, while providing novel insight into the utility of this mark in evaluating salmonid stocks. Relevant publications since previous Trout Committee update:

Bushon, A. M., and J. M. Rash. 2021. Retention of postocular visible implant elastomer in two sizes of adult Brown Trout and Rainbow Trout. North American Journal of Fisheries Management 41:1384–1389.

Bridgewater Tailrace Brown Trout Fishery

Bridgewater Tailrace is a 29-km waterway extending from Lake James to Lake Rhodhiss on the Catawba River in western North Carolina. An 18-km reach of the stream is classified as Special Regulation Trout Waters by the WRC and is managed as a put-grow-and-take brown trout (*Salmo trutta*) fishery. Although our initial study spanned 2011–2015, staff continued to explore the population dynamics of the fishery. Collaboration with Francis Marion University researchers supported the development of an integrated population model that incorporates monitoring data and low-cost batch mark–recapture data. Relevant publications since previous Trout Committee update:

Doll, J. C., C. J. Wood, D. W. Goodfred, and J. M. Rash. 2021. Incorporating batch mark-recapture data into an integrated population model of Brown Trout *Salmo trutta*. North American Journal of Fisheries Management 41:1390–1407.

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 Hatch Chart developed in partnership with the North Carolina Council of Trout Unlimited was posted to help trout anglers match aquatic insect hatches in western North Carolina and has been well received.

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 a project to evaluate the efficacy of a rubberized fish ladder (Flexi-Baffles) to improve passage within a native Brook Trout population. 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, Vice Chair of the Steering Committee, and a member of the Science and Data Subcommittee.

R3

The NCWRC hired an Angler R3 Specialist in 2019. Efforts are underway to market the NCWRC's Tackle Loaner Program (link) and gain user data relative to R3 elements (including follow-up contact). An angler onboarding campaign is currently emailing new and lapsed anglers (3-year dormancy) to share general and North Carolina-specific fishing information, with follow-up communications to determine retention. A subsistence fishing evaluation is on the horizon to increase user demographic information and establish more effective marketing campaigns. Fishing in North Carolina information has been placed at tourist and welcome centers across the state, with companion social media efforts. Topical or resource specific media have been developed (e.g., interview with Production Supervisor after catastrophic flooding last year and

guide for using our interactive access map). Finally, there are numerous workshops each year that center around trout and trout fishing (i.e., general events for the public and targeted user groups).

Additional Publications from Previous Efforts

Previous research efforts and NCWRC activities have been reported in other SDAFS Trout Committee updates. This section provides additional information relative to those efforts.

Unger, S., L. A. Williams, J. M. Rash, L. Etchison, D. Owensby, and J. D. Groves. 2021. *Cryptobranchus alleganiensis alleganiensis* (Eastern Hellbender): larval predation. Herpetological Review 52:817.

Harris, A. C., R. D. Hanks, J. M. Rash, D. W. Goodfred, and Y. Kanno. 2021. Standard weight (*W*s) equation for Brook Trout in southern Appalachian Mountains streams. Journal of Fish and Wildlife Management 12:183–189.

2022 SDAFS Trout Committee Meeting (Graves Mountain Lodge, Syria, VA)

Roundtable (TN / TWRA)

1. *R3*

- A Statewide Trout Angler survey (email and mail) in partnership with the University of Tennessee-Knoxville was conducted in November and December 2021; report is available. The survey was sent to 5,952 individuals licensed to fish for trout in Tennessee and was designed to determine their preferences regarding their trout fishing experiences and beliefs and attitudes regarding various trout management options in Tennessee. There was a 15% response rate, but only 638 were determined to fish for trout in Tennessee and thus were included in the study (63 were non-resident license holders). Three-quarters (77%) of the respondents indicated being either somewhat or very satisfied with their recent fishing experience in Tennessee, while only 11% indicated they were somewhat or very dissatisfied. 91% of nonresidents reported being somewhat or very satisfied.

- Community Fishing Program—new creel regulations (five for trout and Channel Catfish)

2. *Native Brook Trout restorations and enhancements*:

- At the midpoint of TN's Native Brook Trout Management plan (2017-2027), restoration/enhancement projects on 9 streams have been completed or are nearly complete. This has increased native Brook Trout distribution by 10 miles or 71% of the plans goal.
- Completed a unique native Brook Trout restoration in Norton Creek (2 km) in 2021 that involved removing existing hatchery-origin Brook Trout in a stream on private land (with conservation easement). Partnered with the landowners, NPS-GSMNP, TU, and USFWS. Evaluation to follow in 2022.

- Added Little Stony Creek (recent native Brook Trout restoration) and Rough Ridge Creek (native Brook Trout) to our special Wild Trout regulations.
- Continuing to do summer temperature monitoring (through TU) in several Brook Trout streams and some that are prospective restoration candidates.

- We added 2.3 miles of SABT into 3 fishless streams during summer 2021. We will continue to stock hatchery cohorts into these streams during 2022 and 2023 in order to maximize family size. Our distribution work in 2021 identified four more potential streams that are fishless and we will continue temperature monitoring in 2022. Unlike Kulp, who has a bit of a headstart, our distribution work will be complete in 2035.

3. *Tailwater trout fisheries*:

- The CFRU/Tennessee Tech research project to assess stocked Rainbow Trout survival, growth, and recruitment in the Norris and Ft. Patrick Henry tailwaters is entering its fourth year. Preliminary results continue to indicate that there is substantial natural reproduction by Rainbows in the Norris tailwater and limited recruitment of stocked fingerlings there and in the Ft. Patrick Henry tailwater. Adult-stocked Rainbows exhibit exceptional growth in the Ft. Patrick Henry tailwater (26-27.7 mm per month).
- Cutthroat Trout (Snake River fine-spotted subspecies *Oncorhynchus clarkii behnkei*) were stocked in the Appalachia (Hiwassee River), Boone (S. Fork Holston River, and Tims Ford (Elk River) tailwaters in 2021/early 2022. This is the first stocking of Cutthroats in TN since the 1960s and involved about 9k adult (8-9 in.) fish (2,650 in R4). Used as a means for generating new interest in trout fishing—produced engagement on Facebook reaching nearly 100k people and a new state record (13 oz., Hiwassee River).

4. *Other Trout Waters*:

- Added Big Soddy Creek (Hamilton Co.) to Delayed Harvest streams (now have seven).
- We started a one-year creel on the put-take Tellico River fishery in March. So far anglers have been very successful with harvest rates around 2 trout/hour. The Tellico area has been rapidly changing the last few years with a new fly shop and guide service. We are using this creel to also gauge angler interest in the two-story management strategy of put-take in summer and delayed-harvest in winter.

Virginia

Submitted by Brad Fink (VDWR)

Stocked Trout

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 fairly large buzz among anglers as well. Anglers seems to be pleased with the Tiger Trout that have been stocked. See more at https://dwr.virginia.gov/fishing/trout/tiger-trout/ and https://www.youtube.com/watch?v=FeZrThS3sF4

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.

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.

"Addition of eDNA sampling to stream inventories improves Brook Trout management in Virginia"
In 2019, we collected environmental DNA (eDNA) samples from 36 streams in Virginia where Brook Trout were considered extirpated based on electrofishing inventories. Brook Trout DNA was detected in 8 of the 36 streams. In 2020, we paired backpack electrofishing and eDNA during our annual stream inventories and sampled 41 streams throughout the native range of Brook Trout in Virginia. We collected Brook Trout at 37 sites using backpack electrofishing and detected Brook Trout at all 41 sites using eDNA. We concluded that small Brook Trout populations may evade detection by our traditional electrofishing approach and eDNA improved our ability to accurately map and monitor the distribution of Brook Trout in Virginia.
Abstract accepted by Wild Trout 2022.

Reintroductions

DWR is looking into reintroducing eight streams thought to be extirpated of Brook Trout. These streams originally had Brook Trout prior to 1990, but did not have a positive eDNA or electrofishing sample 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 we sampled multiple locations on five streams to begin determining the possible population 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 at between four and 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 sample were collected in late July and early August. VDWR plans to sample these same streams in late May 2022 shortly after the last stocking of the season on these streams. Preliminary results will be available soon.

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.

Gill Lice

Recently Gill Lice (*Salmincola californiensis)* were discovered on Rainbow Trout in Blue Springs Creek, a tributary to Cripple Creek, located in Smyth and Wythe Counties. This watershed also contains multiple private hatcheries that stock mostly within that same watershed. VDWR's approach to managing this is still in discussion, but by utilizing our current fish stocking authorization we plan to manage the spread of Gill Lice. See more at https://dwr.virginia.gov/fishing/trout/gill-lice/

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) with the USFWS. Biologists plan to conduct AOP surveys during wild trout monitoring surveys, in select watersheds with wild Brook Trout and on DWR Wildlife Management Areas to determine AOP concerns and prioritize crossing for improvements. This will be completed in partnership with "sister" agencies.

Outreach

Facebook / Youtube

Have been putting videos, etc., on social media about stocked and wild trout management and fishing to engage with the public. VDWR conducted a Facebook Live event in early 2021 with hatchery managers and fish biologists to take questions from the public. Over 100 people attended.

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/

Wild Brook Trout Conservation

VDWR received many comments regarding the concerns of wild Brook Trout management and conservation during our last regulation cycle. Biologists in coordination with VDWR Outreach staff plans to produce and disseminate social media content during the summer of 2022 illustrating the efforts put forth for the wild Brook Trout conservation.

Saving Private Stocked Trout Waters

Bringing community members together to clean private waters has retained fishing access on stocked trout waters in Shenandoah County. See video on Youtube here: https://www.youtube.com/watch?v=McnEppTzw5c

2022 West Virginia Update to the Trout Technical Committee Southern Division of The American Fisheries Society

David Thorne and Jim Hedrick

- Regularly scheduled Spring stocking season will end the week of May 23rd. Many brown and rainbow trout fingerlings have already been stocked in cooperation with various TU chapters. Due to the agency's shift to the Crawford brown trout strain, fingerlings were less available this year, but we are hoping for a lot of surplus fingerlings in 2023. Overall, the hatchery system had lower than normal production this year but the current 2021 cohort to be stocked in 2023 is looking strong.

- Hatchery improvements are nearing completion at the Bowden Hatchery and the facility is now a state of art recirculating aquaculture system. We are expecting production increases to exceed 100,000 pounds for the 2023 season. Several other hatcheries are being evaluated for cost benefit ratios associated with capital improvement efforts. We will be accepting hourly labor applications this fall for 2023. – Jim Hedrick, Hatchery Program Manager

- Regulation Changes – we collected temperature and population information on a number of our larger Catch-and-Release streams to evaluate a possible change to Delayed Harvest regulations. Increasing DH opportunities for anglers is a stated objective of the Trout Management Plan. Based on collected data, several changes have been proposed to the Natural Resources Commission and are pending approval by that body. If so approved, new regulations will be enacted on January 1, 2023. Stream sections proposed for change from year-round C&R to DH are Williams River C&R

below Tea Creek CG (2 miles), Shavers Fork C&R below Cheat Bridge (5.5 miles), North Fork South Branch Potomac River C&R at Seneca Rocks Discovery Center (0.75 miles) and Paint Creek (12.5 miles). New waters under consideration for year-round C&R include a new section of Shavers Fork between Bemis and Bowden (6.1 miles), Dunloup Creek near New River National Park and Preserve (7.3 miles), and the Guyandotte River upstream of Mullens, including all tributaries (180 miles). The Guyandotte is a large system that supports reproducing rainbow trout in the mainstem and many tributaries and has become a destination fishery outside the traditional trout range in West Virginia. The high-quality water is a function of cold, alkaline groundwater discharges from the vast network of deep mines for coal in that part of the state.

- Brook Trout surveys – we continued our collection of native Brook Trout data for establishing their current western range in the state in 2021. All Brook Trout are fin-clipped and archived for a pending evaluation of Ohio-basin genetics in our populations. Over 4000 genetic samples have been collected to be sub-sampled for analyses once a proposal for research and a contract are in place with the Wild Genomics lab (Dr. Amy Welsh) at West Virginia University.
- One mile of native Brook Trout water was restored as a challenge cost-sharing project with the Monongahela National Forest. Native Brook Trout are abundant up- and downstream of the affected reach, which was a former logging camp and grazing allotment over the past 100+ years. The degradation had left the channel in a very poor state for occupation by Brook Trout. Rootwad trees were embedded into the substrate and banks, bankfull overflow channels were created, and elevated hummocks were built to support upland tree species. Over 200 stems were planted in spring 2022 to complement the work. A partnership between fisheries, game and nongame wildlife, and forestry disciplines worked cohesively to design and construct the project to meet the needs of all facets of ecological restoration.
- In 2022, we have deployed an electrofishing team to the southern part of the state to inventory as many non-traditional trout waters as possible. High-quality alkaline (low sulfur and iron) coal mine effluents boost flows and decreases temperatures to make many streams habitable for introduced rainbow and brown trout to the point that many populations are self-sustaining and expanding into adjacent waters. Since the presence of trout changes the water quality standards of these streams, it is imperative to catalog their presence to appropriately assess these waters when new environmental permitting needs arise. They will be documenting quality of trout populations and habitat. With that information, we hope to be able to identify differences between habitats that have become occupied and those that remain unoccupied.
- We will enter another Brook Trout stream habitat partnership with the Monongahela National Forest and West Virginia University Natural Resources Analysis Center. A two-mile reach of First Fork (Shavers Fork major tributary) is being treated for acid precipitation impacts and has not reached its expected fishery potential. Limited habitat has been one of the hypothesized reasons for the lack of fishery development. Failing banks, an old eroding logging road, and lack of large stable wood are issues to be addressed to improve the fishery. An associated water quality study looking at nutrient deficiencies in the watershed may provide additional insight.
- Native Brook Trout rearing and repatriation efforts continue at the Reymann Memorial Farm aquaculture facility. Over 500 native-stock fingerlings have survived to be stocked into 3 receiving waters to augment past efforts in those areas. An interesting experiment has yielded some interesting results. Cacapon basin stock from different streams have excellent fertilization and survival rates when crossed with one another. An effort to increase genetic diversity for a population that does not have a more appropriate donor population was tried by crossing some Cacapon fish with some from a Shenandoah basin population. Initial fertilization seemed reasonable, but mortality was soon higher than expected and survival to fry was minimal. No other reason than the different populations were observed.

- A Ph.D. student conducting Brook Trout long-term research with Dr. Kyle Hartman has defended and graduated from WVU. His work, titled "Factors Influencing Brook Trout Population Dynamics and Resilience in Central Appalachian Headwater Streams" should provide multiple publications useful to wild Brook Trout conservation. A second Ph.D. student of Dr. Hartman is working with the same dataset of 25 streams across the WV range to look at the impacts of climate change on Brook Trout recruitment. She is a very ambitious young biologist, so I am expecting quite excellent results from her work.
- We are looking to put some good AOP projects in the ground with the IIJA monies marked for fish passage and resilience. Some high-profile projects are at the top of my list, which now stands at about 40 known passage obstacles. Forest Service, Highways, and TU are working on their priority lists as well. Training for meeting the needs of 100% AOP is being planned for all interested parties in the State in early 2023. A statewide AOP task force is being assembled in the meantime.
- Trout Management Plan – Our long-awaited Comprehensive Trout Management Plan has been completed. DNR and cooperators are moving forward with implementation of the Strategies outlined in the plan to help meet the Objectives and Goals desired by the Technical and Stakeholder Advisory Committees. Administrative holdups will only reinforce our desire to fully implement the plan. A hot link to the plan has been provided to members of the Trout Technical Committee; perhaps a live pathway to it on our website will be re-established soon. – David Thorne, Coldwater Fisheries Biologist and Stream Habitat Coordinator.
  West Virginia Trout Management Plan: https://wvdnr.gov/wp-content/uploads/2022/04/2022.04.25-DNR_Trout-Management-Plan.pdf