Warmwater Streams Committee Open Forum Meeting Minutes

Southern Division, American Fisheries Society
Little Rock, AR–Marriott, Grampas
Thursday, February 20, 2020, 1:00 PM

Agenda

- **Call meeting to order—Kevin Mayes, Chair**

- **Introduction of Technical Committee Members & Guests**
  Attendance: Robby Maxwell (LA), Kevin Mayes (TX), Jim Burroughs (OK), Dennis Riecke (MS), Jeff Williams (VA), William Warner, Adrian Stanfill (FL), Conner Owens (MS), James Hitchcock (MS), Nicholas Stewart (MS), Jeff Quinn (AR), Joseph Dyer (OK), Joseph Mruzek (TX), William Budnick (TX), Beau Gregory (LA), Maeghen Wedgeworth, Peyton Shaw (OK), D Zentner (OK), Raynie Harlan (LA), Sandra Correa (MS), Hannah Burnett (LA)

- **Determination of Quorum (5)—**Robby Maxwell, Secretary-Treasurer, determined six members were present, quorum is met.

- **Approval of Agenda-** Jeff Quinn moved to approve, R. Maxwell second. Unanimous passage.

- **Circulate sign-in sheet**

- **Secretary's Report—**
  - **Approval of 2019 Meeting Minutes (Galveston, Texas)—**Joseph Mruzek's name corrected for spelling. D. Riecke moved to approve as revised, J. Burroughs second. Unanimous passage.

- **Webmaster's Report—**Attached in APPENDIX I.

- **Treasurer's Report—Robby Maxwell—**Robby went over the report, J. Burroughs made a motion to approve, J. Quinn seconded.

- **Chair's Report—Kevin Mayes**
  - WWSC Formal Review – Cindy Williams requested a review of the WWSC in mid-December. Robby and Kevin compiled documents back to 2014. The review was completed with a phone call on January 10, and we received a favorable report. WWSC was a driving force for the last three SDAFS resolutions, has hosted a number of symposia, and has sustained a large and active membership. It was brought up that we need to figure out who will manage our social media since Brian Alfor moved to Ohio. Cindy recommended SDAFS continue to support WWSC. Full report is in APPENDIX II.

  - 2019 Jimmie Pigg Award Winner—Kyler Hecke was mentioned as the 2019 winner

- **Old Business**
  - American Eel Subcommittee is tentatively scheduling a meeting and symposium for SDAFS 2021. The Subcommittee met earlier in the day, and discussed projects across the member states. Group agreed that we need to look into NOAA groundfish surveys.

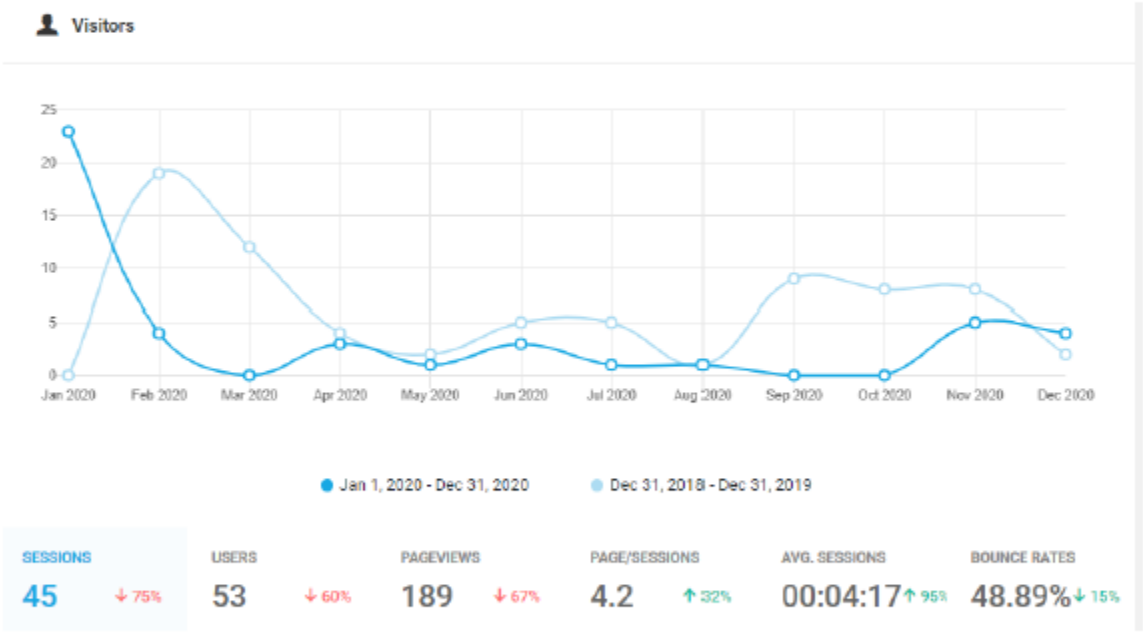
- Fundraising Opportunities
- Website and Listserv—It was decided to send an email to those present with instructions on signing up for listserv.
    - Archives (Hardcopy and Digital)—J. Burroughs passed WWSC files dating from 1976 to K. Mayes. K. Mayes passed to R. Maxwell. Intern in LA scanned all docs, old minutes, and files. They are now on a shared drive. Working on naming files, and they need to be sorted through to find relevant files. The rest will be maintained.
- Revision of Awards (one for master's and one for Ph.D.)—S. Magnelia, J. Quinn, J. Burroughs, and W. Budnick were on Jimmie Pigg Award committee. The award was split between PhD and MS students to make it more competitive. Goal is to get both awards raised from $250 to $500.

- **New Business**
    - Officer Elections (Chair and Sec-Treas). New officers will begin serving two year term for SDFAFS 2021.—No additional nominees, so Trevor Starks was unanimously elected to begin in 2021. No nominations for chair, and nominations will be solicited over the year.
    - 2020 Jimmie Pigg award winner—PhD winner: Zachary Zbinden, MS winner: Taylor Dluzniewki. Four applicants, three MS and one PhD.
        - If no PhD applies, we will make the decision to give two MS awards, or double the award for one.
        - D. Rickes brought up the "nomination letter" and letter of support" wording in the paperwork. They mean the same thing and need to be made to be consistent.
    - Other new business from Committee-at-large—J. Burroughs: wants to see a water quantity resolution as part of water quality standards. There was a move in OK to allow DEQ to release oil and gas waste into rivers and streams. Water is supposed to be treated, but it probably won't be regulated. Proprietary compounds are secret and hard to detect/remove. D. Riecke mentioned that the EPA would probably want to know what is in discharges. It was decided to look into surface water disposal in other states. We wouldn't know what to even look for if the blends are proprietary. J. Quinn mentioned the possibility of a joint resolution with the Pollution Committee. J. Burroughs agreed to talk with Curtis Tackett of the Pollution Committee about the issue. AR, LA, TX, and OK expressed intered in helping craft the issue, maybe into a resolution.
    - Resolutions—D Riecke is chair of Resolutions Committee. Until recently, they only met once a year to vote, but now can meet any time during the year electronically to vote. Jim talked about making a resolution at the federal level, but we were advised to do it at the state level. Every state is revising water quality standards this April. We can use a resolution to communicate that we can impair water quality without a pollutant, and can use a resolution to communicate with DEQs. The resolution could go something like: here's the situation, here's what's being impaired, here's what we want to do.
    - SDAFS President Wes Neal and Vice President Cindy Williams were introduced and said a few words to the Committee
    - VA Chapter reached out looking for workshop ideas for SDAFS 2021. Ideas included aquatic plants, electrofishing, stream sampling methods, tagging, age and growth, crawfish ID, mussel ID
    - Water temperature monitoring—J. Quinn mentions working standards into instream flow projects, mapping temperature, spring and groundwater influence, and cascading effects related to raised temperatures.
    - Roundtable discussion –APPENDIX III

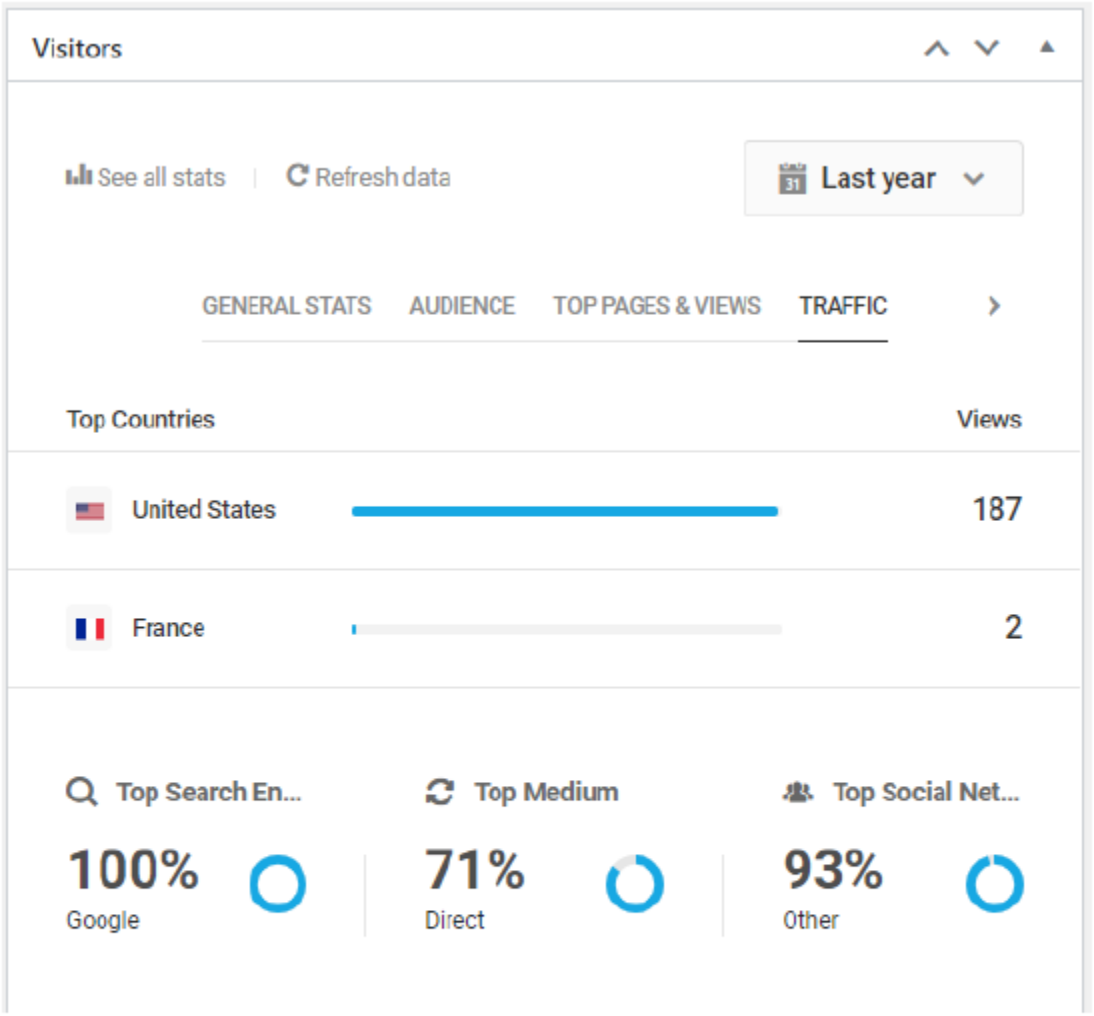
- **Adjourn 5:00 pm**

APPENDIX I – Webmaster's Report

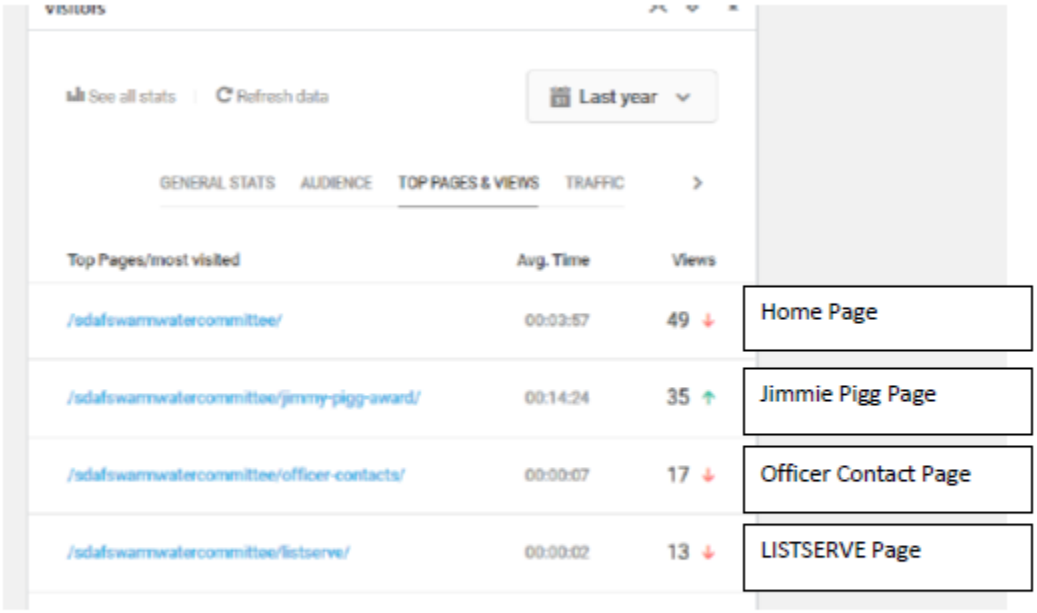
Site Stats for 2020



Decline in visitors during 2020



Majority of visitors from the U.S. and most reaching site by direct search. Facebook not the top social media network.



Negative trend for page views

Site Activities:

- Posted Warmwater Streams Video
- Added Media page
- Updated posts

APPENDIX II – SDAFS Committee Review

Vice-President's Report

Cindy Williams, Vice-President, Southern Division, AFS

Annual Program of Work and Status

- Charge: The Vice-President should plan to attend the Division Annual Executive and Business Meetings held at the Annual Meeting.
  Action: Attended the ExCom and Business Meeting at 2019 Meeting in Galveston, TX. Arrangements have been made to participate in the SDAFS ExCom and Business meetings in Little Rock, AR, and the Catfish 2020 Technical Committee meeting at the 2020 Annual meeting.
- Charge: Represents the Division at Chapter meetings at the request of the President.
  Action: Attended the Georgia and Tennessee Chapters in 2019, and the GA Chapter meeting in January 2020. Plans have been made to attend the TN Chapter meeting in March, and the Vice President will likely attend the South Carolina Chapter meeting if feasible.
- Charge: Responsible for coordinating implementation of any membership initiatives recommended by the
  Society's Membership Committee at the Division level.
  Action: I attended the FIRST ever meeting of the SDAFS's Women Leadership Group (WLG). The purpose was to set up a form of communication that would continue the forward momentum created at the Annual meeting in Galveston, to provide a platform for networking and mentoring, and start to tackle some of those hot topic issues such as retention of women in our field and sexism in the workplace. The meeting was a tremendous success and I look forward to attending the 2nd meeting this year. I serve on the Society Governing Board, and have provided comments to Scott Bonar on the proposed "Draft Statement of World
  Aquatic Societies on Human-Caused Climate Change", that AFS hopes will be adopted by the World's Aquatic Societies.
- Charge: Performs reviews of a Division Technical or Ad Hoc committee at the request of the President. Action: I reviewed the Warm Water Streams Technical Committee. A comprehensive review is complete, is reported below, and will be presented at the 2020 SDAFS ExCom meeting in Little Rock, AR.

Warmwater Streams Committee Technical Committee Review

Report Prepared by Cindy A. Williams, SDAFS Vice President
Presented at the SDAFS ExCom Meeting – February 21-23, 2020

Background and Current Status

The review of the Warmwater Streams Committee included examination of the Committee website, review of the last 5 years of accomplishments, meeting notes, and a conference call with Kevin Mayes, Chair, and Robby Maxwell, Secretary Treasurer. The Warmwater Streams Committee was established in 1976 as a technical committee within the Southern Division of the American Fisheries Society to address issues related to warmwater streams in the southeast. The Warmwater Streams Committee has a tradition of conducting projects that promote the exchange of information among fisheries and aquatic scientists. These include publishing books, technical manuals, sponsoring workshops and symposia, and developing position statements and resolutions. In 1997, the membership developed their own Strategic Plan following the precedence set by the Parent Society in 1987 (Ad Hoc Committee) and 1997

(Coutant, 1997). The Warmwater streams committee membership felt issues related to warmwater streams and fisheries should be examined within a watershed context, as evidenced by their mission statement: "*…promotes the conservation and management of watersheds and streams in the southeastern United States by providing a forum for the exchange of ideas, information, and concerns."* The Warmwater Streams Committee is committed to working with federal, state and local agencies and organizations; the American Fisheries Society and its subunits; the general public; and others to examine warmwater streams issues within a watershed context.

Current Activity and Accomplishments (2014–2020)

The Annual Program of Work for the Committee has followed the strategic plan, and is developed informally during the annual meeting, held in conjunction with the SD AFS annual meeting. The Warmwater Streams Committee website shares information such as meetings, minutes, videos, manuals, symposia proceedings and other literature, and established the WWSC Listserve to facilitate communication. The Committee prolifically sponsors symposiums most years at the SD and Parent Society annual meetings. The Committee has promoted adoption of 3 SD resolutions since 2015, sponsored 2 National AFS meetings, and the annual Jimmie Pigg Scholarship Award to students working on warm water stream research field projects.

Specific Accomplishments to note include:

- Facebook page created to increase awareness and recruitment
- Promoted adoption of SDAFS Resolution on the Use of Off-highway Vehicles in Streams
- Promoted adoption of SDAFS resolution on Fish Data Standardization
- Developed and promoted adoption of SDAFS resolution, The Inclusion of Hydrologic Alteration as an Impairment in State Water Quality Standards; voted on and approved by the SDAFS and moved to the parent society for consideration.
- Organized and hosted workshop on Stream Fish Data Standardization
- Warmwater Streams Symposium I (1981) and II (2004) scanned and posted as PDF
- Sponsored Symposium: Advancing Environmental Flows (SDAFS 2018, Puerto Rico)
- Sponsored Symposium: Advancing Environmental Flows (AFS 2018, Atlantic City)
- Sponsored Instream Flow Council's FLOW 2018 in Ft. Collins, Colorado
- Sponsored Symposium: American Eel (SDAFS 2017, Oklahoma City) and supported Bill McLarney registration and participation in symposium
- Sponsored Symposium: American Eel Research and Conservation in the Gulf of Mexico: What Are We Doing and Where Are We Headed?
- Organize and sponsor American Eel Symposium (SDAFS 2021, Virginia)
- Formation of the American Eel Subcommittee
- Formation of an Adhoc subcommittee to revise the Jimmie Pigg Award criteria and process

The Committee membership is not exclusive and is comprised of a mixture of state and federal agencies, universities, consultants, and others. The "Roundtable Notes" from the Annual meeting notes are by state and represents all members residing or working within the specified state. Topics range from flow issues, the expansion of aquatic invasive species, flood, storm and chemical spill impacts, current and needed research, species status surveys, and specified subcommittee activities focused on specific fish species or fish communities.

In between the annual meetings, the Committee's EXCom meets by phone on an irregular basis as issues arise. The
Committee's website keeps members informed in the absence of traveling to in person meetings, and other communications occur through the use of their Listserrve.

Recommendation to the SDAFS ExCom

The Warmwater Streams Technical Committee is an active and relevant unit within the Southern Division. The 3 Primary Goals in their Strategic Plan, annual work plan goals, objectives, activities, and accomplishments serve its members and the Division well. This Committee is an example of a successful model among SDAFS Technical Committees, and like most things in life, there is always room for improvement and expansion. The Committee's leadership is in a good position to meet the needs of the resource and its members. Much of the work of the Committee and its members is focused on restoration of habitat, flows, and fish community populations in these unique systems. To me, the Warmwater Streams Committee's work focuses on some of the most imperiled habitats and species in North America, and are the Center of Aquatic Biodiversity. Recommendation to the SDAFS ExCom is to continue to support the Warmwater Streams Committee so they can continue to achieve their goals and objectives and contribute to those of the Southern Division and the Society.

APPENDIX III – Roundtable Notes

Louisiana

Prepared by Robby Maxwell, LDWF

- Mississippi flooding: Bonnet Carre Spillway was opened in back-to-back years for the first time, and twice in the same year for the first time.
    - 17 Pallid Sturgeon, 208 Shovelnose Sturgeon, and a number of Paddlefish and American Eels were caught below the Bonnet Carre after it closed. All living specimens of these species were returned to the Mississippi River. One Pallid and 43 Shovelnose were dead. Black Carp were caught for the first time that low in the Mississippi Basin.
- Scenic Stream fish and mussel sampling continued in SWLA. *Pleurobema riddelli* was collected on a tributary of the Calcasieu, a new population.
- American eel sampling continues, with *Anguillicoilodes crassus* appearing in a number of samples. Eels were rescued in a Toledo Bend Spillway dewatering, and deceased

specimens were brought back to lab for processing. First males of the project were caught recently.

- Hurricane Barry led to fish kills in the Lower Atchafalaya and Mississippi basin. Notably, many Asian carp died.
- The Lacombe office concluded mussel sampling in the Pearl River Basin. They also concluded Freckled Madtom sampling using electrified riffle kicks into a seine, which yielded more specimens than any other method, to date. The method was adopted from MDFWC.
- The hydropower project at the Overton Lock and Dam has been delayed, again. LDWF is working with the project due to concerns about migratory fishes, notably sturgeon and eels.
- The Louisiana Watershed Initiative is still underway, with the aim to reduce flood risk to people and property in the state. LDWF continues to advocate for conservation of fish and wildlife communities in the effort. Statewide modeling of stream flows and flood events is about to commence. 100-150 new stream gauges are going to be placed in the state. Modeling needs, community needs, and natural resource manager opinion will all be considered in the placement. Pre-proposals for "no regrets" projects have been submitted.
- Rangewide analysis of Calcasieu Painted Crawfish.
- Rickard K Yancey fish passage and water quality improvements continue with LMRCC. Currently surveying for culvert and weir replacements. Fish community response will be monitored.

Oklahoma

2020 SDAFS Warmwater Streams Committee – ODWC Stream Program Round Table Notes

Little Rock, Arkansas

Fish Community Surveys

- In 2019, we conducted 154 surveys at 52 sites in the North and South Canadian watersheds using replicate surveys built within an occupancy modeling framework.
- The Stream Program is working on collecting community data across the entire state. The occupancy modeling framework will allow us to estimate detection rates for different species (and different gears) that inform occupancy probabilities at a range of spatial scales to better understand contemporary fish distributions and the mechanisms underlying species' presence that will ultimately identify future research needs and update conservation priorities.
- Thus far, 5 watersheds have been sampled, and 595 surveys have been completed at 202 sites.

- The Stream Program will sample the Washita River watershed in the summer of 2020, which will finish the west/central portion of the state and provide a robust dataset for analyzing Great Plains stream fish assemblages.

Sportfish Surveys

- In 2019, we collected black bass population dynamics from the Blue River in south central Oklahoma, and Blue and Flathead Catfish population dynamics data from the Spring River in northeast Oklahoma.
- Thus far, black bass population dynamics data have been collected from 8 rivers, and catfish data has been collected from 6 rivers throughout Oklahoma.
- Black bass and catfish represent the most sought after lotic species in Oklahoma. Collection of sport fish population dynamics data will be used to establish baseline contemporary data sets and monitor temporal trends in dynamic rate functions in selected stream fisheries. Data from this program will be used to generate statewide standards that will be useful for comparing populations among streams and/or regions to help determine specific management goals. In conjunction, data will be used to evaluate various stream harvest regulations under an adaptive management framework. We will continue to collect population dynamics data from representative lotic systems throughout Oklahoma before evaluating statewide regulations.
- Using data collected within the Stream Program and solicited from entities throughout the United States we have submitted a publication called “Otolith and scale based growth standards for lotic Smallmouth Bass” to give managers updated standard growth equations based on over 11,000 Smallmouth Bass from 81 rivers across their native range in the U.S. while also providing growth standards like predicted age-specific standard length, percentile distributions of age-specific standard length, and estimates of time required to reach specified size classes calculated separately for individuals based on aging structure used (i.e., otolith vs scales).

Research

- Research continues on a study evaluating potential effects of stocking large Rainbow Trout in Spavinaw Creek in northeast Oklahoma. Seasonal field collections have been ongoing since 2018. We led field efforts and data analyses that evaluated changes in absolute abundances of native species before and after stocking, as well as a diet study examining the feeding ecology of introduced Rainbow Trout and their effect on the diets of native Redspot Chub and Neosho Smallmouth Bass. Also assisted Oklahoma State University with field surveys to estimate weekly survival, habitat

use, and movement of stocked Rainbow Trout in this system. Administration will make decision on stocking future stocking permits.

- Assisted Oklahoma State University with field collections for study examining potential effects of gigging on sucker populations in Spavinaw Creek.
- Assisted Oklahoma State University with field work for a black bass creel study in three Ozark streams (upper Illinois River, Baron Fork, Caney Creek).
- Submitted a research proposal to link Smallmouth Bass genetics to population dynamics data in the upper Illinois River where both native Neosho Smallmouth Bass and non-native Tennessee-strain Smallmouth Bass (via stockings in Tenkiller reservoir in the 1990s) are present. Using an existing fin-clip collection of around 600 individuals, additional fin-clip/otolith collections during the study, and a SNP panel developed by collaborative researchers we would be able to investigate the effect of genetics on growth rates, update our understanding of the spatial distribution of non-native alleles, determine parental lineage information to assess the trajectory of the upper Illinois River Smallmouth Bass fishery (i.e., will we see continued introgression of non-native alleles into the native genome or has it stabilized), and even assess differences in catch rates among the native and non-native strains by pairing genetics data from a tagging reward study used in the creel study previously mentioned in the bullet above.
- Assisted Fish Kill Coordinator with massive mussel kill due to complete drawdown of Webbers Falls reservoir after tow-barges broke loose during major flooding and crashed into the dam. Estimated loss of mussel community valued at over $50 million.

Sucker Gigging in the Ozark Highlands Ecoregion (Oklahoma)

- Catosotmids are an understudied family of fishes
- Within the Ozark Mountains sucker gigging (harvest via modified spear) is a historically and culturally important practice
- Little is known regarding the potential influence of gigging on catostomid populations and no regulations currently exist for catostomid populations in Oklahoma
- By collecting demographic, coarse spatial, aquatic community, and gigging harvest information we hope to better understand the long term effects of different harvest levels on the catostomid population and ecosystem

Tennessee

TWRA Region 1 (West Tennessee)

I. Stream Sampling efforts

- Twenty streams and two river samples were conducted in summer and fall of 2019
- Assisted TDEC and TDOT through ARAP projects in correlation with bridge replacement projects. Conducted stream sweeps in these locations to determine the absence of T&E species
- Creel on six put and take urban trout ponds in December and January
- Monthly samples below Pickwick Dam and Cheatham Dam were conducted for the presence of Asian Carp
- Conducted Diversity and Distribution samples of Crayfish during our routine sampling during the summer months of July and August
- Alligator gar were stocked off of Highway 18 and Highway 100 into the Hatchie River for the purpose of reintroduction of that particular species
- Developed a new specimen voucher for the use of teaching labs for Bethel College classes as well as future outreach programs
- Helped the GENOA Fish Hatchery in the removal of scutes for marking on Lake Sturgeon
- Stocked Brood Rainbow Trout from Tellico Fish Hatchery for the purpose of a Fishing event held in December
- Taught the lab portion for the Ichthyology class for Bethel College

TWRA Region 2 (Middle Tennessee)

- Conducted sportfish surveys and otolith collection from Smallmouth Bass on Duck River (42 sites). We also have been piloting a new electrofishing raft to sample "in-between" streams. Using the raft we surveyed sportfish on Piney River (10 sites), Yellow Creek (6 sites), and East Fork Stones River (8 sites).

- Community and sportfish surveys were conducted by backapck or tow barge on several tributaries: Murrell Creek, Mill Creek, Bledsoe Creek, East Fork Stones River, and Little Bigby Creek.

- Completed permitting on a new property in order to construct a boat ramp on Richland Creek. This access will extend current floating opportunities from a single 4.5 mile float to the option of a 9 mile float or two 4.5 mile floats.

- Staff also gave presentations on stream communities and public access at various fishing clubs and school-based STEM programs.

- Staff published a forthcoming SEAFWA article in March 2020 with the TN Fish Coop: "Smallmouth Bass Population Characteristics and Minimum Length Limit Evaluation in Two Tennessee Rivers"

- The first half of 2020 will involve three separate creel surveys on seasonal trout fisheries but we plan to expand the use of the raft to new streams and extend the range of "old streams" by being able access areas to shallow or rocky for jet boats.

TWRA Region 4 (East Tennessee)

- The Agency continued with monitoring activities surrounding the developing Habitat Conservation Planning for the North Cumberland Wildlife Management Area. This is a comprehensive plan in collaboration with the USFWS that will allow the Agency to have a blanket permit for forest management covered under the plan. Stream monitoring has focused on establishing baseline population trends for two covered species in the plan, Blackside Dace and Cumberland Arrow Darter,

- The region has been participating with SSA (Species Status Assessments) projects undertaken by the USFWS for fish species petitioned under the Endangered Species Act. These have included Sickle Darter and Diamond Darter in 2019.

- The region has continued with black bass and rock bass surveys in priority streams and rivers.

- Cooperative community fish assessments (IBI) have continued in select streams.

- Creel surveys have continued on warmwater stream/river fisheries in recent years to capture angler harvest and use data as well as economic value. In 2020, the fishery below Cherokee Dam (Holston River) will be surveyed.

- The region has been working on adding additional river access points and has been successful at completing two of these in the past year. A new access was completed on the Powell River and an existing canoe launch on the Clinch River was renovated. The region continues to partner with various organizations/agencies to develop access and blueway trails.

- Several outreach events were held in the region that included youth fishing events, trout in the classroom, and streamside aquatic ecology demonstrations.

- The region assisted the University of Tennessee with Bluebreast Darter collections in the Nolichucky River. This effort was a continuation of the Pigeon River Restoration project. The 2019 effort was the best yet, with 129 darters being translocated to the Pigeon River.

- The region has continued to be involved with the Little Tennessee River Native Fish Partnership which a multi-agency/institution group focusing on protecting native aquatic resources and habitat in the drainage. http://www.littlet.org/

- The region has continued work on documenting the states 95 crayfish species by conducting surveys, photographing, and collecting genetic material for research and identification.

- The region continued work focusing on an AOP project that will reconstruct a road crossing to benefit local citizens and provide connectivity within the stream for two federal and two state listed fish species. The project has been in cooperation with the USFWS, Tennessee Dept. of Transportation and the Campbell County Highway Dept.

Texas

2020 Texas Parks and Wildlife Department River and Stream Activities for the Southeast Fishes Council and SDAFS Warmwater Streams Committee State Reports

Restoring Guadalupe Bass **-** The Guadalupe Bass Restoration Initiative, which started in 2010, continues as a priority project for the Texas Parks and Wildlife Department (TPWD) Inland Fisheries Division. Stockings of pure Guadalupe Bass have brought hybridization rates down to less than one percent in the south Llano River and pure populations have been re-established in the Blanco and San Antonio Rivers. Research studying effects of urbanization on Guadalupe Bass populations in the Colorado River Basin was completed in 2017. In January 2018 a new Guadalupe Bass Conservation Plan was released by TPWD. Efforts to restore Guadalupe Bass have now shifted to the Medina River in the San Antonio River Basin. A 2019 annual report highlighting activities is available. For more information contact timothy.birdsong@tpwd.texas.gov.

Use of fine-scale population and genetic data to inform Guadalupe Bass restoration stocking – Related to the Guadalupe Bass Restoration Initiative, TPWD continues to work to develop more efficient and effective methods to re-establish pure populations of Guadalupe Bass. A new project was initiated in 2019 to develop improved management and stocking strategies suitable for rehabilitation of Guadalupe Bass populations impacted by Smallmouth Bass introgression. In this project, we will test effectiveness of developed strategies varying fish size and stocking density at a fine spatial scale (i.e., short (~1km) reaches separated by instream barriers. For more information contact nate.smith@tpwd.texas.gov.

Watershed Conservation Book - TPWD staff authored or co-authored eleven chapters for the American Fisheries Society Symposium 91 book "Multispecies and Watershed Approaches to Freshwater Fish Conservation". The book focuses on innovative conservation approaches to restore watershed processes for freshwater fish conservation while simultaneously supporting human needs. For more information contact timothy.birdsong@tpwd.texas.gov.

Texas Instream Flow Program **-** An instream flow report for the middle and lower Brazos River basin was published in June 2018; for six sites, recommendations were made for subsistence flows, base flows, and high flow events to address instream flow needs for fish, mussels, riparian areas, water quality, and fluvial geomorphology (i.e., sediment transport and channel maintenance). Instream flow studies have been completed in the Trinity and lower Guadalupe rivers and final reports are expected in 2020. Data from this effort will be used to inform instream flow recommendations for maintaining a sound ecological environment. Study results will be used as best available science for water management to guide state agencies in managing rivers and streams. For more information see Texas Instream Flow Program or contact kevin.mayes@tpwd.texas.gov.

Research to Inform Prescribed Releases for Blue Sucker in the Lower Colorado River, Sabine and Rio Grande **-** TPWD Inland Fisheries staff collaborated with the TPWD Water Resources Branch, Lower Colorado River Authority, and Texas Tech University on movement, population dynamics, and habitat occupancy studies of the state threatened Blue Sucker. A dissertation based on the lower Colorado River study was completed in January 2019. The upper boundary of population size in the 292-rkm study area was estimated at only 1,089 individuals, and recruitment since 2009 appeared weak. Because of the declining population trend TPWD has continued annual population monitoring with the same methodology used in the collaborative

study with Texas Tech. For more information contact nate.smith@tpwd.texas.gov.

Environmental Flows Information Toolkit - TPWD has built a decision support tool, the Environmental Flow Information Toolkit (EFIT), to help develop and prioritize strategies for the protection and restoration of natural flow regimes and water levels in Texas aquatic systems. The web-based geospatial platform incorporates multiple data sources and integrated statistical models to serve critical information on water use, hydrologic alteration, and environmental flow targets to meet conservation objectives. EFIT will enable environmental flow practitioners and stakeholders to communicate and collaborate more effectively to achieve voluntary environmental flow protection and restoration strategies. Initially EFIT encompasses the Great Plains of Texas and will be expanded statewide in 2020. For more information contact david.bradsby@tpwd.texas.gov.

BioBlitz Initiative - Since 2013 the TPWD River Studies Program has been collaborating with the University of Texas on bioassessments of rivers and streams adjacent to State Parks and Wildlife Management Areas. This initiative supports management needs of these properties, informs recreational initiatives such as the TPWD's Texas Paddling Trails and River Access and Conservation Area Programs, and guides future research and conservation efforts through TPWD's Native Fish Conservation Area initiative. Bioassessment reports include fish, benthic macroinvertebrate, freshwater mussel, riparian, and instream habitat data, as well as recommendations for improving conditions for aquatic and riparian species and recreational use. The latest bioassessment was completed on the Paluxy River. Bioassessment reports are available on-line at the River Studies Reports page on the TPWD web site. For more information contact stephen.curtis@tpwd.texas.gov.

Alligator Gar Research Assessing Inland and Coastal Alligator Gar within Coastal Rivers— Inland Fisheries Division staff continue to focus research on Alligator Gar populations. One study involves identification and estimates of abundance for adult Alligator Gar using side scan sonar in the middle and lower Brazos River. The project will examine Alligator Gar distribution and habitat characteristics across the longitudinal gradient of the two Texas river systems. Using these data, scientists will develop predictive relationships between habitat variables and Alligator Gar distribution in river systems and quantify and compare dynamic rates of Alligator Gar collected from upstream (inland) and downstream (coastal) reaches of the lower Brazos River. For more information contact clint.robertson@tpwd.texas.gov.

Recovery of habitat and fish assemblage in the Llano River following a flood— Following a large-scale flood in the Llano River watershed in October 2018, TPWD Inland Fisheries Division staff began a project to compare post-flood habitat availability and fish assemblage structure to pre-flood conditions that were documented in the preceding decade. The project will also assess the resilience of the assemblage with a focus on Guadalupe Bass, a species of greatest conservation need and also important to local recreational fisheries. Data collected in this project will help inform what, if any, actions might be taken to restore habitat or fish populations following a large flood. For more information contact preston.bean@tpwd.texas.gov.

Recovery of Macroinvertebrate Communities After Flooding Events in the Blanco, Colorado, and Llano Rivers - The objective of this study is to understand the effect of a catastrophic flood event on various macroinvertebrate taxa, and to track the recovery of the macroinvertebrate communities until they stabilize. For more information contact archis.grubh@tpwd.texas.gov.

Collaborative Research to Inform Conservation Decisions for Imperiled Freshwater Mussels - In 2010, 15 of the 52 identified freshwater mussel species that occur in Texas were listed as state-threatened. Since that time, research to fill critical knowledge gaps for managing populations of these species has been a focus of TPWD. In the past three years alone, TPWD has collaborated with the United States Fish and Wildlife Service to fund approximately $1 million in State Wildlife and Section 6 program grants for freshwater mussel research. For more

information contact clint.robertson@tpwd.texas.gov.

Maintaining instream flows and building public support for native fish and mussel conservation and river recreation in the Devils River Basin - The Devils River in southwest Texas is a unique desert river and considered the most pristine river in the state. It is home to many imperiled endemic species such as the Devils River Minnow; however, groundwater pumping poses an imminent threat of reduced spring flows. Baseflow reduction would negatively impact many already imperiled species and degrade one of the state's most remote and scenic paddling and angling destinations. TPWD continues to be engaged in a number of technical studies such as groundwater-surface water interaction and fish habitat availability modeling, as well as building relationships with landowners to help ensure the rivers future. For more information contact sarah.robertson@towd.texas.gov.

Saltcedar Management on the Upper Brazos River – Since 2015, TPWD, in partnership with 90+ local landowners, USFWS Partners for Fish and Wildlife Program, and others, has implemented salt cedar management in the upper Brazos River. Salt cedar infestation poses issues for water, but also degrades habitat for fish and wildlife, including two imperiled fishes. Research studies are underway at sites throughout the upper watershed to evaluate the effects of salt cedar management on water budget, water quality, instream habitat, and riparian plant communities. For more information contact monica.mcgarrity@tpwd.texas.gov.

River Access and Conservation Areas Program - With more than 95% of the land in Texas privately-owned and the state's population expected to potentially more than double by 2050, the public's access to land for recreational use, especially land close to major urban areas where demand is greatest, is in increasingly short supply. In 2011-2012, TPWD developed the River Access and Conservation Area Program (RACA) to address the need for increased access to the state's rivers and streams. This program has leased 19 public river access sites along the banks of the Brazos, Colorado, Devils, Guadalupe, Llano, Neches, Nueces, Sabine, and South Llano rivers. These leases provided access to more than 45 miles of new bank and wade fishing opportunities and have increased access to more than 180 additional miles of river. For more information contact john.botros@tpwd.texas.gov.

American Eel Study - TPWD is partnering with the University of Texas at Austin, University of Houston-Clear Lake, USFWS, and citizen-science volunteers to assess the status of American Eel in Texas to better inform conservation and management decisions. The primary objectives of this study are to assess the distribution and abundance, habitat use, movement patterns, and population structure (genetics and demographics) of American Eel across all life stages. Field sampling is primarily focused on the Texas Coastal Plain with a concerted effort to collect glass and elver eel using a variety of gear types (including small-mesh fyke nets and eel mops). Most eel collected to date have been female yellow eels; one silver eel was found dead on a Texas beach. No glass eel or elver have been collected despite extensive effort. The non-native nematode, *Anguillicoloides crassus*, has been documented from the swimbladder of American Eel at three locations. For more information contact stephen.curtis@tpwd.texas.gov.

Frio River Sand and Gravel Permit Study - Due to an increasing volume of sand and gravel permit requests within the Frio River basin the Texas Parks and Wildlife Department suspended issuance of these permits until a biology and geomorphology (sediment and hydrology) study was completed. Results of the study are to be used to make better informed permitting decisions. The study area covers approximately 26 river miles. This was a collaborative study between TPWD, the Texas Forest Service and Texas Water Development Board. A final report was completed and is available online at the River Studies Report web page on the TPWD web site. For more information contact melissa.parker@tpwd.texas.gov.

Effects of Energy Production on West Texas Springs - Freshwater springs contribute substantially to the west Texas regions water quantity and quality. These springs are also

ecologically important as they provide habitat for numerous rare and federally listed endemic aquatic species. While much of far west Texas has experienced petroleum exploration and production over the last half century a newly discovered gas and oil field in the proximity of the San Solomon Springs complex, has raised concern about the future of flows at the springs. It is estimated that as many as 5,000 new wells, requiring 4-15 billion gallons of water, will be drilled in the next 20 years. This water will likely be pumped from local aquifers. Recommendations for the Biological Community include formulating a routine biomonitoring program to establish baseline conditions and track species status and health as well as supporting federal Recovery Plan and refugia efforts. A biomonitoring plan for San Solomon Spring is available from Chad Norris chad.norris@tpwd.texas.gov.

Monitoring Effects of Arundo Management Study - Arundo is a non-native, cane-like perennial grass that grows prolifically along riparian corridors in moist environments in the U.S. It has been shown to negatively influence riparian and instream environments by altering native riparian community composition, reducing riparian arthropod abundance and diversity, possessing higher proportions of non-native compared to native aquatic macroinvertebrates in root wad habitat, increasing modeled channel depth and current velocity and consuming higher amounts of water than native vegetation. Biological and physical habitat monitoring is being conducted in Barons Creek to assess the effects of herbicide treatment of Arundo and the success of native riparian reestablishment on a long-term scale in the Pedernales watershed. The purpose of this study is to compare biological and physical variables through all stages of Arundo treatment and riparian recovery to assess herbicide treatment effect on biological communities, riparian plant composition and physical stream habitat. Contact Monica McGarrity monica.mcgarrity@tpwd.texas.gov for more information on this project.

Development of an Index of Biotic Integrity for Large Rivers in Texas - The Texas Commission on Environmental Quality and TPWD have Indices of Biotic Integrity (IBI) which are relatively effective for identifying and classifying different levels of biotic integrity among fish and macroinvertebrate assemblages in wadeable streams across Texas. An important next step for Texas is the development of IBI's for larger non-wadeable rivers. For more information contact gordon.linam@tpwd.texas.gov.

Long-Term Assessment of Fish and Freshwater Mussel Community Impacts from a Newly Permitted Wastewater Discharge in the Sabine River - An inter-divisional TPWD team is assessing potential impacts to the Sabine River freshwater mussel community from a wastewater discharge from a new large-scale poultry processing plant. The proposed discharge location is in an area recognized by TPWD as a mussel sanctuary because of the known diversity and abundance of freshwater mussels. Objectives are: 1) Qualitative assessment of mussel community changes upstream and downstream of the wastewater discharge location over four years; 2) Quantitative assessment of mussel community densities and population dynamics; 3) assessment of juvenile mussel growth and survivorship utilizing mussel cages; 4) assess water quality changes; 5) assessment of long term fish community changes associated with potential water quality changes. For more information contact marty.kelly@tpwd.texas.gov.

Assessment of a Desktop Floodplain Inundation Model Development Process for Biological Studies at a Large Scale - The objective is to compare the accuracy of floodplain inundation models derived from HEC-RAS to GIS derived models utilizing readily available digital elevation models and USGS rating curves. For more information contact clint.robertson@tpwd.texas.gov.

Development of Instream Flow Requirements through Spawning Habitat Availability for Alligator Gar Recruitment Success in the Lower Guadalupe River - Utilizing the Alligator Gar spawning habitat availability model developed by Texas State University and Alligator Gar year-class strength data developed by Heart of the Hills Fisheries Science staff the objective is to develop high flow pulse recommendations for successful Alligator Gar recruitment success for

the Texas Instream Flow Program study on the lower Guadalupe River. For more information contact clint.robertson@tpwd.texas.gov.

Brushy Creek Creel Survey and Fisheries Management Report - The fish population of Brushy Creek was surveyed in the fall of 2018 and the spring of 2019 using boat electrofishing (lotic portions) and backpack electrofishing (lentic portions) of the system. Roving creel surveys were conducted in fall of 2018 and spring of 2019. There were no known previous creel or angler utilization surveys for the Brushy Creek system. Based on results of these surveys statewide Community Fishing lake regulations were applied throughout the entire creek system within Williamson County. For more information contact patrick.ireland@tpwd.texas.gov.

Least Disturbed Streams: An Extension of the Texas Aquatic Ecoregion Project - This project is a continuation of the Texas Aquatic Ecoregion Project that originated in the early to mid-1980's. During that time period, a coordinated effort with the Texas Commission on Environmental Quality was initiated to sample least disturbed ecoregion reference streams to establish environmental baselines for the development of indices designed to evaluate aquatic life use (report available at: https://tpwd.texas.gov/publications/pwdpubs/media/pwd_rp_t3200_1086.pdf). The overall goal of the current project is to expand, refine, and consolidate the information on streams in Texas that can potentially serve as least disturbed ecoregion reference streams. The project will also contribute data in support of macroinvertebrate metric regionalization and objectives such as nutrient criteria development by providing data on background concentrations of environmental variables. For more information contact gordon.linam@tpwd.texas.gov.

Effects of Altered Water Quality on Populations of Smalleye Shiner and Sharpnose Shiner in the Upper Brazos River – Smalleye and Sharpnose Shiners are endemic to the Upper Brazos River (above Possum Kingdom Reservoir) and were listed as federally endangered by the U.S. Fish and Wildlife Service in 2014. Degraded water quality is one of the threats to these fish and the Upper Brazos River receives treated effluent from eleven facilities including one drinking water plant that treats groundwater through reverse osmosis. This facility has historically discharged wastewater with high concentrations of selenium, a metal known to cause birth defects in fish and birds. Water quality and fish tissue samples were collected from two sites on the upper Brazos River and one site each on the Double Mountain Fork Brazos River and Salt Fork Brazos River. Elevated levels of metals were found in both water and fish tissue samples from the Brazos River, Salt Fork Brazos River, and Double Mountain Fork Brazos River. Selenium in fish tissue was not detected in any of the samples, but high concentrations of selenium were detected in water quality samples from the Salt Fork Brazos River. For more information contact marty.kelly@tpwd.texas.gov.

Honey Creek State Natural Area Baseline Water Quality Study – Honey Creek State Natural Area (HCSNA) covers 2,293.7 acres and is located directly adjacent to Guadalupe River State Park. Honey Creek originates from Honey Creek Cave, the longest mapped cave in Texas, and is home to a variety of rare karst organisms including the Cascade Caverns Salamander as well as a number of sensitive aquatic organisms that live in the creek itself. In 2018 a development company proposed to build a dense residential area directly adjacent and upstream of Honey Creek and applied to discharge treated effluent into the Honey Creek watershed through a Texas Discharge Pollution Elimination System (TPDES) permit. The company has since withdrawn this permit and has re-applied for a Texas Land Application Permit (TLAP) which will allow the development to applied treated effluent to specified irrigation areas within the development. The Meadows Center for Water and the Environment began collecting baseline water quality samples from two sites along Honey Creek and TPWD Water Quality staff continue to collect water quality and periphyton data from Honey Creek to establish the baseline conditions of Honey Creek. For more information contact marty.kelly@tpwd.texas.gov.

Activities submitted by Stephan Magnelia, 512-754-6844, stephan.magnelia@tpwd.texas.gov

Virginia

Virginia Warmwater Streams Update
SDAFS Warmwater Streams Technical Committee
SDAFS Meeting – February 2020

Prepared by Jeff Williams

New River Muskellunge Exploitation Study

In January 2019, a Muskellunge tagging project was initiated on the lower New River (below Claytor Dam). This work will provide angler catch and exploitation information for the New River Muskellunge fishery, but will also serve as a comparison for a similar study conducted on James River.

A total of 204 adult Muskellunge were tagged with single-barb dart tags during the first year of this study. Approximately 35% of the fish were double-tagged to estimate tag retention. In addition to receiving a dart tag, adult Muskellunge were PIT tagged to provide additional information on the population. Juvenile Muskellunge collected during the project only received PIT tags. Response cards were distributed to anglers encountered at primary access points to estimate angler response rate.

Tag retention was 100% and the angler reporting rate was estimated at 45%. Adjusted tag return information suggests that 50% of the tagged population was caught by anglers during the first year of study. Despite this relatively high catch rate, no Muskellunge were harvested. These results were comparable to those observed from the James River. Tagging for the second year began in January 2020, but high flows have limited sampling time. To date, just over 50 Muskellunge have been tagged.

Muskellunge Management Plan

The VDGIF Warmwater Streams Committee recently completed a draft statewide Muskellunge management plan as requested by the Chief of Fisheries. This plan will guide future management actions and provide justification of current management efforts aimed at this species. One of the key items in the plan included identification of how Virginia's Muskellunge fisheries fit in to the agency's R3 efforts. The plan admits that Muskellunge fisheries are likely not suited for recruiting new anglers to the sport. However, there is a great potential for Muskellunge fishing to retain or reactivate existing anglers. Another important aspect of the plan was to examine ways to reduce the cost and annual variability in the production Muskellunge fingerlings by VDGIF's hatcheries. The plan is currently under review by the Chief of Fisheries and the Aquatic Resources Science Team.

Water Withdrawals – Tidal Rivers

Due to depletion of the principal coastal plain aquifers (and saltwater intrusion into some of them), the Virginia DEQ has been undertaking an initiative to reduce groundwater usage in this part of the state. As a result, multiple water users are exploring surface water alternatives for water supply purposes. Most of these users are looking into direct withdrawals from tidal

rivers/streams, as opposed to new reservoir construction or tapping into existing reservoirs. As a result, there is a large number of permits for water withdrawals in tidal freshwater rivers. This is a relatively new arena for our agency, and we are learning on the fly. Since withdrawals from tidal systems do not change the physical habitat (e.g., depth, velocity, etc.), we are exploring these from a water quality perspective (temp, salinity, DO, nutrients, etc.). Based upon findings from other states, water quality alterations tend to be linked (e.g, DO changes with changes in salinity), and salinity appears to be the simplest parameter to model. Thus, we have been approaching these withdrawals by looking at how the changes in flow impact the salinity regime of these tidal waters. So far, we can use the models to determine how salinity might change, but we're still learning how to interpret these results. Since these systems are very dynamic anyway, how does a change in the salinity regime impact aquatic life (particularly if the changes are subtle)? Up to this point, we have focused on things like the area of freshwater (0.0 psu) refugia or changes in maximum salinity level at a certain location. We are unsure if this is actually telling us what we need to know, but it's a learning process. Additionally, we are more than willing to speak with others who have had some experience in this arena.

Walleye Genetics

There has been a substantial amount of effort aimed at the characterization of Walleye genetics and in Virginia much of this work has been aimed at the New River. Previous research conducted by Virginia Tech had identified a unique walleye stock native to the New River. However, it remained unclear how the New River population related to the larger, regional assemblages such as the Eastern Highlands. Additionally, there was little known about some of the other rivers in Virginia where Walleye are native such Clinch and Powell Rivers in the Upper Tennessee River drainage. Another more recent study conducted by Virginia Tech wanted to examine the genetic structuring of Walleye in the eastern United States and how Virginia Walleye populations fit into this structure. The take away message from this research was that both the Upper Tennessee and New River populations were members of the Eastern Highlands evolutionarily significant unit. However, there is enough genetic differentiation and demographic independence between the two populations that the researchers recommended treating these populations as distinct management units.