CHAD TEAL

Curriculum Vitae

Assistant Unit Leader; Assistant Professor
USGS-Utah Cooperative Fish and Wildlife Research Unit; Utah State University – Watershed Sciences
5200 Old Main Hill – BNR 165, Logan, Utah 84322, U.S.A.; (407) 257-0127; chad.teal@usu.edu

EDUCATION

Ph.D., December 2022 — **University of Arizona,** Fisheries Conservation and Management; Minor- Genetics
The development of Trojan sex chromosome carrying red shiner (Cyprinella lutrensis) and green sunfish (Lepomis cyanellus) to control their nuisance populations
(Committee: Scott Bonar, Melanie Culver, Kevin Fitzsimmons, Daniel Schill)

M.P.S, May 2016 — **University of Miami,** Marine Affairs and Policy- Aquaculture
The design and construction of a zero discharge, solar powered recirculating aquaculture system for the Miami Science Barge
(Committee: Daniel Benetti, Joshua Grubman, Nathalie Manzano, Theodore Caplow)

B.S., May 2012 — **University of Florida**, Biology; Minor- Fisheries and Aquatic Sciences

RESEARCH

PUBLICATIONS

Peer-Reviewed Articles

Teal, C.N., Schill, D.J., Fogelson, S.B., Bauder, J.M., Roberts, C.M., Fitzsimmons, K., Stewart, W., and S.A. Bonar. 2024. The effects of estradiol-17β on the survival, growth, and sex reversal of red shiner *Cyprinella lutrensis* and its use in the development of YY broodstock. *North American Journal of Aquaculture*, 86(1), 110-129.

Teal, C. N., Coykendall, D. K., Campbell, M.R., Delomas, T.A., Eardley, D.L., Erwin, J.A., Schill, D.J., Bonar, S.A., and M. Culver. 2023. The development of genetic sex identification markers and evidence of a male heterogametic sex determination system in red shiner *Cyprinella lutrensis*. *North American Journal of Aquaculture*, 85(1), 74-86. doi: 10.1002/naaq.10274.

Teal, C.N., Schill, D.J., Fogelson, S.B., Roberts, C.M., Fitzsimmons, K., Bauder, J.M., Stewart, W., and S.A. Bonar. 2023. The effects of estradiol-17β on the survival, growth, and sex reversal of green sunfish *Lepomis cyanellus*. *Aquaculture,* 562, p. 738853.

Teal, C. N., Coykendall, D. K., Campbell, M.R., Eardley, D.L., Delomas, T.A., Shira, J.T., Schill, D.J., Bonar, S.A., and M. Culver. 2022a. Sex-specific markers undetected in green sunfish *Lepomis cyanellus* using restriction-site associated DNA sequencing. *Journal of Fish Biology,* 100(6), 1528–1540.

Teal, C. N., Schill, D. J., Fogelson, S. B., Roberts, C. M., Fitzsimmons, K., and S.A. Bonar. 2022b. Development of aquaculture protocols and gonadal differentiation of green sunfish (*Lepomis cyanellus*). *Aquaculture*, 547, p. 737515.

Teal, C. N., Schill, D. J., Fogelson, S. B., and S.A. Bonar. 2021a. Development of aquaculture protocols and gonadal differentiation of red shiner. *North American Journal of Aquaculture*, 83(3), 145-154.

Tracy, E. E., **Teal, C. N.**, Ingram, S. J., Jenney, C. J., Grant, J. D., and S.A. Bonar. 2021b. The impact of COVID-19 on freshwater fisheries fieldwork and data collection. *Fisheries*, 46(10), 505-511.

Fogelson, S. B., Yanong, R. P. E., Kane, A., **Teal, C. N.**, Berzins, I. K., Smith, S. A., ... and A. Camus. 2015. Gross, histological and ultrastructural morphology of the aglomerular kidney in the lined seahorse *Hippocampus erectus*. *Journal of Fish Biology*, 87(3), 805-813.

Manuscripts In Preparation (drafts available upon request)

Teal, C.N., Landguth, E., Day, C., Bauder, J., Bonar, S.A., Schill, D.J., Jenney, C.J., Hedden, S., Blasius, H., and P. Reinthal. Comparisons of YY red shiner Cyprinella lutrensis introductions for nuisance population eradication in two Southwestern streams. To be submitted to North American Journal of Fisheries Management.

Book Chapters

Tracy, E.E., Brouder, M.J., Iles, A.C., **Teal, C.N.**, and S.A. Bonar. Chapter 20: Indices for Common North American Fishes. In: Bonar, S.A., Hubert, W.A., Willis, D.W. (Eds.), Standard Methods for Sampling North American Freshwater Fishes Vol 2.

Unpublished Reports (available upon request)

Teal, C.N. 2016. The design and construction of a zero discharge, solar powered recirculating aquaculture system for the Miami Science Barge. Unpublished Masters Report. University of Miami Repository.

Teal, C.N., Chow, S., Sutton, S., and D.D. Benetti. 2014a. Analysis of Japanese *Seriola quinqueradiata* (Hamachi) Aquaculture Sustainability. University of Miami Research Report Submitted to Japanese National Research Institute of Fisheries Science.

Teal, C.N. 2014b. Offshore Aquaculture Site Selection for *Seriola quinqueradiata* (Hamachi) Cages in Southern Kyushu, Japan. University of Miami Research Report Submitted to Japanese National Research Institute of Fisheries Science.

Popular Media

Teal, C.N. (2018) "USFWS and a Mining Company Collaborating for Conservation?" Arizona/New Mexico Chapter of the American Fisheries Society Newsletter, *Fish Soup*, 51, 11.

Teal, C.N. (2018) "All Hands on Deck at the Verde River" Arizona/New Mexico Chapter of the American Fisheries Society Newsletter, *Fish Soup*, 51, 11.

Teal, C.N. (2018) "Supermales to the Rescue" *Fish Soup*, 52, 14-16. Arizona/New Mexico Chapter of the American Fisheries Society Newsletter, *Fish Soup*, 51, 11.

Teal, C.N. (2017) "Take a Field Trip to the Miami Science Barge" South Florida Public Broadcasting System

GRANTS — Year Awarded

- "Development of YY Bullfrogs, *Lithobates catesbeianus*, and models of their release for invasive population extirpation"
  PI: **Teal, C.N. (100%),** Co-PIs: Bauder, J.M., and Z.B. Klein,
  New Mexico Dept of Fish and Game- $351,800 — **to be routed in January 2025**

- "Thiamine Availability in the Weber River and its Implications for Native Fish Conservation and Sportfish Management"
  PI: **Teal, C.N. (100%),** Utah Division of Wildlife Resources- $130,969 **2024**

- "*Common Carp Feminization Trials for Invasive Population Mitigation*"
  PI: **Teal, C.N. (100%)**, Western Association of Fish and Wildlife Agencies- $250,702 **2024**

- "*Implementation of the Trojan Sex Chromosome Approach in the San Juan River: Investigation and Validation of Feminization Methods for Channel Catfish*"
  PI: **Teal, C.N. (100%),** collaborators: Zeigler, M.P., and T.A. Diver, U.S.F.W.S- $215,474 **2023**

- "*YY red shiner Cyprinella lutrensis Investigations: Task 1- Simulated releases of YY red shiner, Task 2- red shiner population testing with developed genetic sex identification markers, and Task 3- Estradiol-17β derived pathology in red shiner*"
  PI: **Teal, C.N., (100%),** collaborators: Bonar, S.A., and D.J. Schill, U.S.B.O.R - $233,775 **2023**

- Arizona and New Mexico American Fisheries Society Chapter 2022 Small Grant Award, American Fisheries Society- $1,312 **2022**

- **"***Backcross validation research using YY male red shiner Cyprinella lutrensis*",
  PI: Bonar, S.A. (100%), collaborator: **Teal, C.N.** U.S. Bureau of Reclamation - $96,000 **2022**

- "*Genetic sex identification marker research and sex reversal research with red shiner Cyprinella Lutrensis and green sunfish Lepomis cyanellus*",
  PI: Bonar, S.A. (100%), collaborator: **Teal, C.N.** U.S. Bureau of Reclamation - $126,033 **2020**

- Arizona and New Mexico American Fisheries Society Chapter 2020 Small Grant Award, American Fisheries Society- $1,000 **2020**

- "*Histology on developing red shiner Cyprinella lutrensis and green sunfish Lepomis cyanellus"*,
  PI: Bonar, S.A. (100%), collaborator: **Teal, C.N.** U.S. Bureau of Reclamation- $27,000 **2018**

PRESENTATIONS

Invited Presentations

Teal, C.N., Landguth, E., Day, C., Bauder, J., Bonar, S.A., Schill, D.J., Jenney, C.J., Blasius, H., Reinthal, P., Hedden, S., and K. Mosher. A Path Forward for YY Red Shiner Implementation. Gila River Basin Native Fishes Conservation Program Annual Reporting Meeting, December 10, 2024.

Teal, C.N., Landguth, E., Day, C., Bauder, J., Bonar, S.A., Schill, D.J., Jenney, C.J., Blasius, H., and P. Reinthal. Simulations of YY red shiner *Cyprinella lutrensis* introductions for nuisance population mitigation in a Southwestern stream. Desert Fishes Council, November 21, 2024.

Teal, C.N., Landguth, E., Day, C., Bauder, J., Bonar, S.A., Schill, D.J., Jenney, C.J., Blasius, H., and P. Reinthal. Simulations of YY red shiner *Cyprinella lutrensis* introductions for nuisance population mitigation in a Southwestern stream. USU-UDWR Brown Bag Series, February 20, 2024.

Teal, C.N., Landguth, E., Day, C., Bauder, J., Bonar, S.A., Schill, D.J., Jenney, C.J., Blasius, H., and P. Reinthal. Simulations of YY red shiner *Cyprinella lutrensis* introductions for nuisance population mitigation in a Southwestern stream. Gila River Basin Native Fishes Conservation Program- Annual Reporting Meeting. December 11, 2023.

Teal, C.N.,and D.J. Schill. YY Fish Overview. Gila River Basin Native Fishes Conservation Program- Annual Reporting Meeting. December 11, 2023.

Teal, C.N. 2023. The development of Trojan Sex Chromosome Carrying (YY) Green Sunfish *Lepomis cyanellus* and Red Shiner *Cyprinella lutrensis*. YY Fish Consortium All-Hands Meeting. Phoenix, AZ, November 14, 2023.

Teal, C.N. 2023. Fisheries Management and Conservation Through Novel Applications of Captive Population Research. Utah Division of Wildlife Resources' 3 Species Meeting. Salt Lake City, UT, November 8, 2023.

Teal, C.N. 2023. Fisheries management and conservation through novel applications of aquaculture and genetics. Research Seminar. Logan, UT, March 17, 2023.

Teal, C.N. 2022. The development of Trojan sex chromosome carrying Green Sunfish *Lepomis cyanellus* and Red Shiner *Cyprinella lutrensis* to control their nuisance populations. Gila River Basin Native Fish Program- Technical Committee Meeting. Tucson, AZ, December 14, 2022.

Teal, C.N., 2022. The development of Trojan sex chromosome carrying Green Sunfish *Lepomis cyanellus* and Red Shiner *Cyprinella lutrensis* to control their nuisance populations. Dissertation Defense. Tucson, AZ, November 14, 2022.

Teal, C.N., 2022. The development of YY Red Shiner (*Cyprinella lutrensis*) for invasive population control. USFWS Collaborative Conservation and Adaption Strategy Toolbox Webinar. Virtual, September 27, 2022.

Teal, C.N., 2022. Attempts at the development of Trojan sex chromosome carrying Green Sunfish (*Lepomis cyanellus*). American Fisheries Society 152nd Annual Meeting, Spokane, WA, August 21-25, 2022.

Teal, C.N., 2022. The development of YY Red Shiner (*Cyprinella lutrensis*) for invasive population control. American Fisheries Society 152nd Annual Meeting, Spokane, WA, August 21-25, 2022.

Teal, C.N., 2021. Efforts in the development of Trojan sex chromosome carrying Red Shiner (*Cyprinella lutrensis*) and Green Sunfish (*Lepomis cyanellus*) for the control of nuisance populations in the Southwest. Gila River Basin Native Fish Program- Technical Committee Meeting. Virtual, December 8, 2021.

Teal, C.N., 2020. Developing trojan sex chromosome carriers (YY Males or ZZ females) to control nuisance fish populations in the Southwest. Gila River Basin Native Fish Program- Technical Committee Meeting, Virtual, December 9, 2020.

Teal, C.N., 2020. Developing trojan sex chromosome carriers (YY Males or ZZ females) to control nuisance fish populations in the Southwest. Annual AZ Cooperative Research Unit Cooperators Meeting. Phoenix, AZ, February 11, 2020.

Teal, C.N., 2019. Developing trojan sex chromosome carriers (YY Males or ZZ females) to control nuisance fish populations in the Southwest. Gila River Basin Native Fish Program- Technical Committee Meeting. Cottonwood, AZ, December 10, 2019.

Teal, C.N., 2018. Developing trojan sex chromosome carriers (YY Males) to control nuisance fish populations in the Southwest. Gila River Basin Native Fish Program- Technical Committee Meeting, Silver City, New Mexico, December 11-13, 2018.

Teal, C.N., 2018. Developing YY males to control nuisance fish populations in the Southwest. Arizona Native Fishes Conservation Team Statewide Meeting, Phoenix, Arizona, November 8, 2018.

Teal, C.N., 2018. Developing YY males to control nuisance fish Populations in the Southwest. Colorado River Aquatic Invasive Species Task Force Meeting, Virtual, September 26, 2018.

Teal, C.N., 2016. The Miami Science Barge. Rotary Club of Miami, November 11, 2016.

Teal, C.N., 2015. The design and construction of a zero discharge, solar powered, recirculating aquaculture system for the Miami Science Barge. Master's Defense, Miami, Florida, May 6, 2015.

Contributed Presentations

Teal, C.N., Landguth, E., Day, C., Bauder, J., Bonar, S.A., Schill, D.J., Jenney, C.J., Blasius, H., and P. Reinthal. Simulations of YY red shiner Cyprinella lutrensis introductions for nuisance population mitigation in a Southwestern stream. 44th Researchers Meeting- Upper Colorado River Endangered Fish Recovery Program & San Juan River Basin Recovery Implementation Program. January 30, 2024.

Teal, C.N., 2023. YY Red Shiner *Cyprinella lutrensis* Spawning Viability, Fecundity, and Sex Ratios of Progeny. 56th Joint Annual Meeting, Arizona and New Mexico Chapters of the American Fisheries Society, Farmington, NM, February 2-4, 2023.

Teal, C.N., 2022. The Development of Genetic Sex Identification Markers and Evidence of a Male Heterogametic Sex Determination System in Red Shiner *Cyprinella lutrensis*. 55th Joint Annual Meeting, Arizona and New Mexico Chapters of the American Fisheries Society, Virtual, February 3-5, 2022.

Teal, C.N., 2021. Efforts in the development of Trojan sex chromosome carrying Red Shiner (*Cyprinella lutrensis*) and Green Sunfish (*Lepomis cyanellus*) for the control of nuisance populations in the Southwest. 53rd Annual Desert Fishes Council Meeting, Virtual, November 17-18, 2021. *Best Student Presentation Award Winner*.

Teal, C.N., 2021. Gonadal differentiation and effects of estradiol-17β on the survival, growth, and sex reversal of Green Sunfish. American Fisheries Society 151st Annual Meeting, Virtual, November 6-10, 2021.

Teal, C.N., 2021. Gonadal differentiation and effects of estradiol-17β on the survival, growth, and sex reversal of Green Sunfish. Western Division of the American Fisheries Society Annual Meeting, Virtual, May 10-14, 2021.

Teal, C. N., 2020. Effects of estradiol-17β on the survival, growth, and sex reversal of red shiner. American Fisheries Society 150th Annual Meeting, Virtual, September 14-25, 2020.

Teal, C. N., 2020. Effects of estradiol-17 Beta on the survival, growth, and sex reversal of Red Shiner. 53rd Joint Annual Meeting, Arizona and New Mexico Chapters of the American Fisheries Society, January 30 - February 1, 2020. Prescott, Arizona. *Best Student Presentation Award Winner*.

Teal, C.N., 2019. Developing trojan sex chromosome carriers (YY Males) to control nuisance fish populations in the Southwest. The American Fisheries Society's 149th Annual Meeting and Joint Conference with the Wildlife Society. Reno, NV, September 29 - October 3, 2019.

Teal, C.N., 2019. Developing trojan sex chromosome carriers (YY Males) to control nuisance fish populations in the Southwest. 52nd Joint Annual Meeting of the AZ/NM American Fisheries Society, AZ Chapter of The Wildlife Society, and NM Chapter of The Wildlife Society. Albuquerque, New Mexico, February 7-9, 2019.

Teal, C.N., 2018. Developing YY males to control nuisance fish populations in the Southwest. 50th Annual Desert

Fishes Council Meeting, Death Valley, California, November 14-18, 2018.

Teal, C.N., 2018. The Miami Science Barge: Developing a Small-Scale, Portable Environmental Education Platform. 148th Annual Meeting of the American Fisheries Society, Atlantic City, New Jersey, August 17-23, 2018.

AWARDS — Year Awarded

- 2023 Best Paper in the North American Journal of Aquaculture
  "The development of genetic sex identification markers and evidence of a male heterogametic sex determination system in red shiner *Cyprinella lutrensis*." **2024**
- Best Dissertation – University of Arizona School of Natural Resources **2023**
- River Field Scholar,
  River Field Scholar Network Curriculum Development- $1,000 **2023**
- Carl L. and Laura C. Hubbs Award, 2021 Desert Fishes Council 53rd Annual Symposium,
  Awarded for best student presentation **2021**
- Arizona and New Mexico American Fisheries Society Chapter 2020 Best Student Presentation,
  American Fisheries Society - $50 **2020**
- Miles McInnis Memorial Student Award, Arizona and New Mexico American Fisheries Society Chapter Joint Annual Meeting 2019- $1,000 **2019**
- Florida Bright Futures Scholarship –100% college tuition awarded by the state of Florida **2008-2012**

RESEARCH EMPLOYMENT

Assistant Unit Leader — **June 2023 - Present**

USGS-Utah Cooperative Fish and Wildlife Research Unit

- Acquired $1,182,720 in grants to support graduate student and staff research
- Designed recirculating aquaculture research systems for the Technical and Experimental Aquatics Laboratory
- Assisted with field lessons for Fish Diversity and Conservation course – WATS3100
- Developed and taught Ichthyology- WATS 4540/6540

Research Scientist III — **January 2023 - June 2023**

University of Arizona, Tucson, AZ

- Conducted computer simulations on YY Red Shiner releases for nuisance population control of Aravaipa Creek, AZ
- Designed and implemented ancient population study of Verde River razorback sucker *Xyrauchen texanus*
- Designed and constructed aquaculture systems and assisted in development of aquaculture protocols for Sonora sucker *Catostomas insignis* conservation aquaculture project

Graduate Research Associate — **January 2018-December 2022**

University of Arizona, Tucson, AZ

- Designed and implemented the first, and only, study on the development of Trojan sex chromosome carrying (YY) red shiner and green sunfish to control their nuisance populations
- Provided scientific, technical, and administrative leadership to a diverse staff composed of 20 research technicians, volunteers, and natural resource professionals working on an invasive species study
- Developed genetic sex identification markers using restriction-site associated DNA sequencing data

- Developed effective sex reversal techniques for red shiner and green sunfish using estradiol-17β treatments and conducted comparisons of reproductive physiology among sex reversal groups and control groups
- Uncovered sex determination systems through XY female, YY male, and YY female crosses
- Developed predictive growth models and conducted fecundity assessments for red shiner and green sunfish
- Analyzed data using various mixed-effects models using R
- Designed and constructed 50-tank aquaculture research and hatchery facility and 7,500 gallon recirculating growout facility
- Conducted endangered Gila chub *Gila intermedia* rescue efforts, constructed safe-harbor aquaculture systems, and implemented Gila chub husbandry techniques during the 120,000 acre Bighorn wildfire (2020)
- Consulted with Arizona/Sonora Desert Museum staff on invasive species exhibit and aquarium design
- Acquired $352,936 of project funding, prepared grant proposals, and wrote peer-reviewed publications
- Co-led various wilderness research trips assessing habitat suitability for native fishes of the Verde River, Arizona and assisted with fisheries surveys and lotic/lentic fisheries restoration projects across Arizona
- Helped organize and clean data for 1.8 million record international fisheries database for American Fisheries Society standard methods project
- Reviewed and edited sections of the American Fisheries Society's *Standard Methods for Sampling North American Freshwater Fish*, 2nd edition

Graduate Research Associate and Aquaculture Technician **August 2014- May 2016**

University of Miami Experimental Hatchery, Miami, FL

- Designed and constructed zero discharge, solar powered recirculating aquaculture system for the Miami Science Barge
- Authored report on the design and construction of a zero discharge, solar powered recirculating aquaculture system for the Miami Science Barge

- Collaborated with Japanese National Research Institute of Fisheries Science on Japanese yellowtail *Serioula quinqueradiata* aquaculture sustainability assessment
- Used a variety of geographic information systems data to select the best suited offshore sites for Japanese yellowtail *Seriola quinqueradiata* aquaculture in southern Kyushu, Japan
- Conducted analysis and authored report on Japanese yellowtail *Seriola quinqeuradiata* aquaculture sustainability
- Acquired and analyzed data for various aquaculture studies

Aquaculture Technician **January 2013-June 2013**

Walt Disney World Resort- Epcot, Bay Lake, FL

- Conducted breeding research with koi (*Cyprinus rubrofuscus*) and whiteleg shrimp (*Machrobrachium rosenbergii*)
- Maintained and managed aquaculture facility
- Monitored and managed water quality and daily feedings
- Scheduled exhibit maintenance and cleaning
- Conducted routine fish harvests for various Disney restaurants
- Developed educational tour content and led public tours through the greenhouses and aquaculture facility at Epcot's The Land
- Modified and enhanced educational exhibits

Research Assistant **January 2012- January 2013**

Andrew Kane Ph.D., University of Florida- Aquatic Pathobiology Laboratory, Gainesville, FL

- Provided technical leadership for incoming graduate students on methods used for National Institute of

Environmental Health Sciences seafood toxicology study
- Assisted in the completion of a population assessment of the eastern oyster (*Crassostrea virginica*) in Apalachicola Bay
- Conducted data analysis on reproduction rates of eastern oyster in Apalachicola Bay
- Analyzed specimens for health and condition indices
- Implemented innovative methods and techniques in calculating health and condition indices of eastern oysters

Research Assistant **August 2011-September 2012**

Susan Fogelson D.V.M, Ph.D., University of Florida- Aquatic Pathobiology Laboratory, Gainesville, FL

- Assisted in mycobacterium study using the lined seahorse (*Hippocampus erectus*)
- Examined and described the aglomerular kidney in the lined seahorse by histology and subsequent microscopy (coauthor in Fogelson et al., 2015)
- Conducted data analysis and sample processing using Microsoft Excel and Adobe Photoshop CS5, respectively
- Monitored and managed laboratory water quality and lined seahorse husbandry

TEACHING

Instructor, Ichthyology WATS 4540/6540 **Every Fall Semester starting in 2024**

Utah State University, Logan, UT

- Developed and led lectures and labs investigating topics such as fish phylogeny, behavior, physiology, anatomy, conservation, and management.

Instructor, Zoo and Aquarium Conservation WFSC 345 **Summer 2022**

University of Arizona, Tucson, AZ

- Developed lessons plans and lectures discussing topics such as animal physiology, mating systems, *ex situ* animal management, *in situ* conservation practices, and more
- Collaborated with multiple zoos and aquariums to provide students free access and the ability to conduct their animal behavior studies using data they collected
- Facilitated in-depth discussions and quizzes on associated topics
- Instructed students on empirical methods used for conducting ethogram and activity budget research which was used in their authorship of journal-appropriate research manuscripts

Co-Instructor, Fishery Management and Lab WFSC 455R/555R and WFSC 455L/555L **Spring 2020**

University of Arizona, Tucson, AZ

- Developed lesson plans and lectured both in person and virtually
- Facilitated in-class group discussions as well as virtual group discussions
- Designed and implemented laboratory exercises
- Incorporated experiential learning curriculum utilizing our aquaculture research facilities

Guest lecturer, Various Courses **January 2019- September 2023**

Utah State University, Logan, UT

- Fundamentals of Watershed Science, WATS 3700, Spring 2024 – "Invasive Species and Water Quality"
- Big Ideas in Watershed Science, WATS 6270, Spring 2024 – "Invasion Biology"
- Fish Diversity and Conservation, WATS 3100, Fall 2023 – "Reproduction"

University of Arizona, Tucson, AZ

- Fishery Management and Lab, WFSC 455R/555R and WFSC 455L/555L Spring 2022– "Novel Approaches for Invasive Species Management"; Led a tour and research demonstration at the UA Fisheries Propagation Laboratory for the lab portion of the class
- Renewable Natural Resource Seminar, RNR 696A Fall 2021 – "Scientists' Roles in Advocating for Climate Change Awareness and Mitigation"; Led concomitant graduate student discussion
- Recent Advances in Genetics, GENE 670 Fall 2020 – "Identification of Sex Chromosomes Using Genomics"
- Recent Advances in Genetics, GENE 670 Spring 2020 – "The Use of Restriction-Site Associated DNA Sequencing to Develop Sex Identification Markers"
- Bioinformatics, ECOL 346 Spring 2019 – "Utilizing Stacks Program for Single Nucleotide Polymorphism Discovery in Novel Species"

Grader, Conservation Planning and Wildland Recreation RNR 448 **Fall 2022**

University of Arizona, Tucson, AZ

- Graded online discussion posts and responses to readings
- Provided feedback on discussions and reading responses
- Assisted professor in class website layout and assignment posts

Technical Director and Lead Educator **May 2015- June 2017**

Miami Science Barge, Miami, FL

- Supervised 5 educators, 3 biologists, and cohorts of interns ranging from 2-4 students per semester
- Developed and taught K-12 curriculum covering marine biology, aquaculture, environmental science, ecology, and environmental sustainability
- Advised and mentored high school, undergraduate, and graduate students on internship projects and graduate projects
- Designed, built, and managed living system exhibits, including zero discharge, solar powered recirculating aquaculture systems
- Designed, constructed, and maintained educational exhibit and coral fragment nursery for the critically endangered species, staghorn coral *Acropora cervicornis*
- Led public tours and educated guests about the barge and affiliated programs
- Collaborated and planned multiple public outreach programs with a diverse group of government organizations, universities/schools, private companies, and nonprofit scientific organizations
- Consulted with and designed educational exhibits and living systems for Ecotech, Miami Seaquarium, and Phillip and Patricia Frost Museum of Science

STUDENT MENTORSHIP

Graduate Student Committees- Utah State University

- Chair: M.S. Student, Aric McKinney, expected finish Summer 2026
- Chair: M.S. Student, Phillip Saporito, expected finish Summer 2026
- Chair: M.S. Student, Andrew Wisniewski, expected finish Summer 2026
- Committee Member: M.S. Student, Austin Garner, expected finish Winter 2026

Mentorship- Utah State University, Logan, UT

- Meghan Grace-Slocombe- MS Student in Watershed Sciences Dept
- Brennan Nelson - Undergraduate Research Intern at the Technical and Experimental Aquatics Laboratory
- Audrey Caplow- High School Intern

Mentorship- University of Arizona, Tucson, AZ

- Undergraduate Research Technicians at the University of Arizona Fisheries Propagation Laboratory
    - Amy Heiling, Kaitlyn Tyler, Jesus Bustamante, Hunter Henry, Colby Roberts, Kim Smoot, Cora Thomas, Suhailal Hussein, Kylee Rath, Gabriella Buonavolonta, and Stephen Ferrar
- Graduate Researchers at the University of Arizona
    - Kaitlyn Gahl, Zach Nemec, Taylor Saucier

Mentorship- University of Miami, Miami, FL

- Graduate Intern on the Miami Science Barge
    - Michael Coogan

Mentorship- Florida International University, Miami, FL

- Undergraduate Interns on the Miami Science Barge
    - Andres Gomez and Natalia Padillo-Anthemides

Mentorship- Marine and Science Technology Academy, Miami, FL

- High School Thesis Research at the University of Miami Experimental Hatchery
    - Romi Bakun

PEDAGOGICAL TRAINING & PROFESSIONAL DEVELOPMENT

RFSN Instructor and Curriculum Professional Development Program

University of Arizona, Teaching in Wildlife and Fisheries Science RNR 694D

University of Arizona, Family Educational Rights and Privacy Act of 1974 Training (FERPA)

PROFESSIONAL TEACHING EMPLOYMENT

Eco-Tour Guide **May 2012-October 2012**

Garl's Coastal Kayaking, Homestead, FL

- Educated participants about the flora and fauna in the ecosystems of the Everglades
- Led kayaking and trekking tours in Everglades National Park and Florida Bay
- Guided participants through encounters with wildlife while ensuring their safety
- Maintained and repaired equipment used during tours

Outdoor Recreation Leader **August 2010- May 2012**

University of Florida Travel and Recreation Program (TRiP), Gainesville, FL

- Facilitated environmental education and personal achievement through backcountry experiences and instruction
- Planned, coordinated, and led multiple canoeing, backpacking, and rafting excursions in the southeastern United States for groups of students
- Advertised for planned trips and program activities

SERVICE & PROFESSIONAL SOCIETY MEMBERSHIP POSITIONS

Utah Fish Health Policy Board, Seat 13058 (2024 – 2028)

American Fisheries Society (2018 - present)

- UT Chapter

- AZ/NM Chapter
  - Newsletter Editor (2018 - 2019)
  - Membership Chairman (2019 - 2021)
  - Social Media and Website Chairman (2022-Present)

Desert Fishes Council (2018 - present)

TECHNICAL SKILLS

Aquaculture
freshwater and saltwater system design and construction, system maintenance**,** broodstock collection and management, larval rearing, live feeds, fish pathology diagnosis and treatment, growth and reproduction assessment and enhancement

Fisheries Equipment and Methods
boat electrofisher construction and maintenance, boat electorfishing, backpack electrofishing, raft electrofishing, whitewater navigation and paddling, prepositioned aerial electrofishing device (PAED) construction and implementation, tag implanting (surgical and PIT injector), snorkeling surveys, habitat suitability surveys, gill netting

Genetics and Associated Software
eDNA collection, DNA extraction, ddRAD-seq and single-digest RAD-seq library construction and sequencing, PCR, gel-electrophoresis, data management, Stacks, Python, Primer3, linux coding language

Software
Microsoft Office (Excel, Word, Powerpoint), R Studio, Photoshop, ArcGIS, Desire2Learn (digital learning interface), CDMetaPop

CERTIFICATIONS

U.S. Dept of Interior
Motorboat Operator Certification **2024**

Orlando Medical Institute
Emergency Medical Technician- Florida and National certification eligible for renewal **2014**

National Association of Underwater Instructors
Advanced with Nitrox, Rescue Diver, & AAUS Scientific Diver **2012**

REFERENCES

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