INLAND FISHERIES

2023 ANNUAL REPORT

TEXAS PARKS & WILDLIFE

Conserving freshwater fisheries resources and providing the best possible public fishing opportunities

INLAND FISHERIES
2023 ANNUAL REPORT

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INLAND FISHERIES OVERVIEW

Mission

Conserving freshwater fisheries resources and providing the best possible public fishing opportunities

Scope

The Inland Fisheries Division provides quality fishing opportunities for 3.1 million freshwater anglers on Texas' 1,100 public lakes and 191,228 miles of streams, creeks and rivers. Whether it's preserving Texas native species and freshwater biodiversity, promoting sportfishing, or serving up a wild-caught, healthy source of protein to feed Texas families, the Inland Fisheries Division plays essential roles in managing and conserving public freshwater fisheries resources to meet the needs of all Texans. The Division exists to sustain thriving populations of fish and other aquatic species, and to sustain recreationally, commercially and economically important fisheries. Simply put, people need fish and fish need the Inland Fisheries Division. In 2022, anglers spent an estimated $11.1 billion on food, lodging, transportation and equipment while fishing Texas freshwater and coastal waters, and fishing supported an estimated 51,380 jobs in the state.

3.1 Million
Freshwater Anglers

191,228
Miles of Streams, Creeks, and Rivers

1,100
Public Lakes

Agency Goals

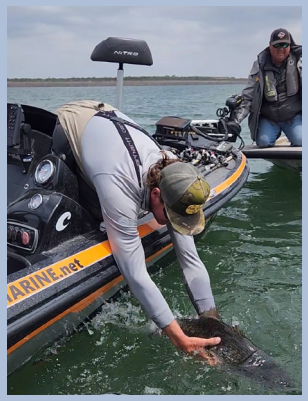
Texas Parks and Wildlife Department's Land and Water Resources Conservation and Recreation Plan (2015) established four primary goals to direct the agency's divisions regarding the state's conservation and recreation needs.

- Practice, encourage, and enable science-based stewardship of natural and cultural resources
- Increase access to and participation in the outdoors
- Educate, inform, and engage citizens in the support of conservation and recreation
- Employ efficient, sustainable, and sound business practices

Division Goals

Division goals were developed to address major issues facing freshwater fisheries resources of Texas.

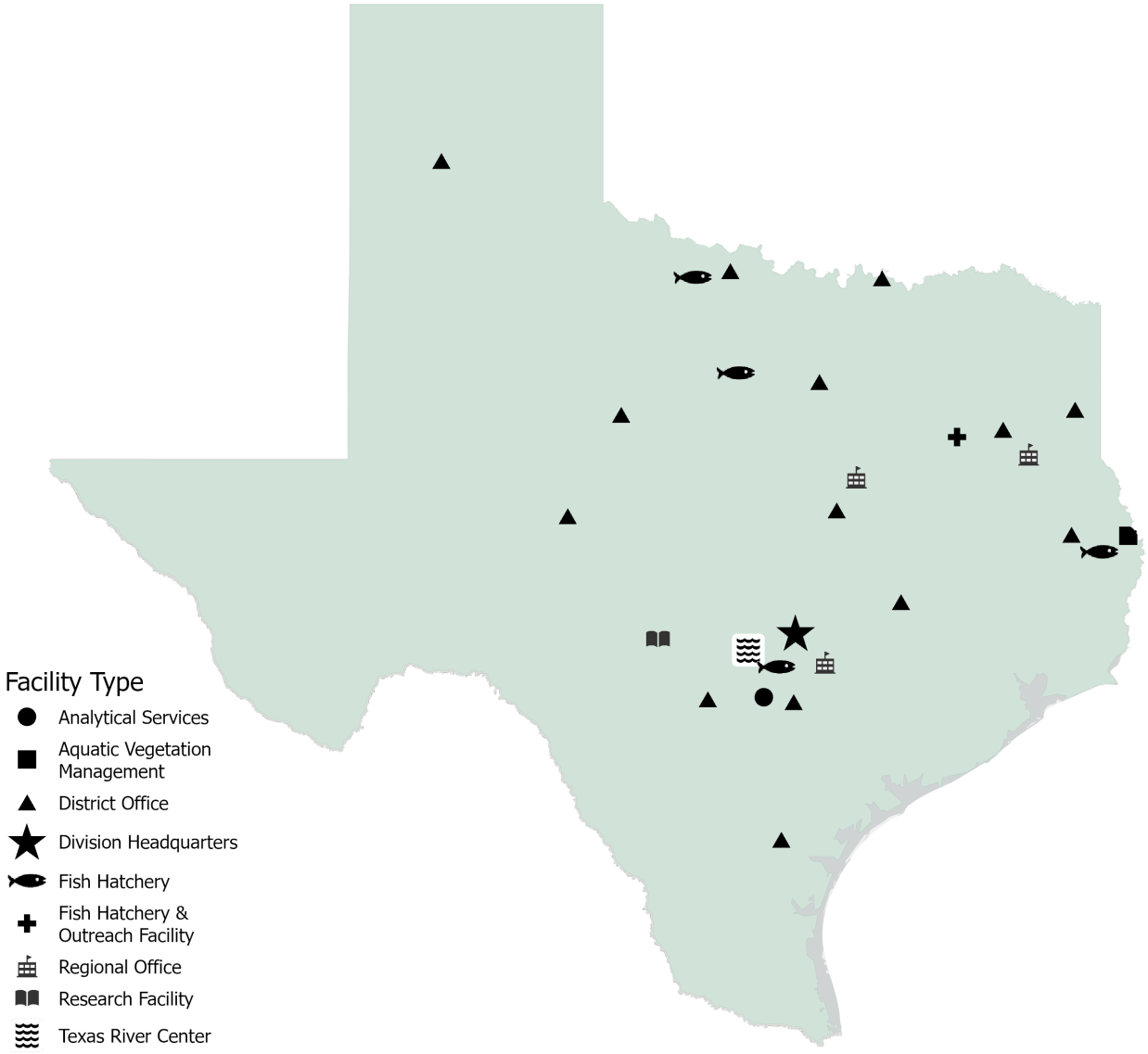
- Maintain or restore appropriate conditions to support healthy aquatic ecosystems
- Maintain quality fish communities for recreation and ecological health and value
- Maintain or increase constituent satisfaction, participation, or stewardship
- Employ efficient and sustainable business practices in fisheries management



Staff

Inland Fisheries has 210.5 positions assigned to management and conservation, hatcheries, outreach, analytical services, science and policy, and administrative programs. For details, see Appendix – Organizational Charts.

Facilities



Contact Information

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(800) 792-1112 or (512) 389-4444 • www.tpwd.texas.gov

Funding and Allocation

In FY23, $20,785,829 was budgeted for Inland Fisheries (not including fringe benefits or capital construction). Federal grants through the Sport Fish Restoration Program reimbursed the Department $8,968,086 for eligible Inland Fisheries activities.
A.2.1. Inland Fisheries Management, A.2.2. Inland Hatcheries Operations

Detail Internal Category Code	Strategy	Aquatic Invasive 0014	Freshwater Fish Stamp 0917	Sand & Gravel 0924	Freshwater Fishing Licenses 0930	Federal Sport Fish Restoration 0931	Emoluments 0932	Bass Plate 3047	Rivers Plate 3050	Total
Base-Operating	A.2.1.		175,000	75,000	4,090,650	5,719,040				10,059,690
		3,066,900				500,000				3,566,900
	A.2.2.		1,300,000		2,427,401	2,749,046				6,476,447
Total-Base		**3,066,900**	**1,475,000**	**75,000**	**6,518,051**	**8,968,086**				**20,103,037**
Capital-Equipment	A.2.1.	15,500			77,000					92,500
	A.2.2.				169,788					169,788
Capital-Transportation	A.2.1.				257,800					257,800
	A.2.2.				59,354					59,354
Total—Capital		**15,500**			**563,942**					**579,442**
Supplemental-Emoluments	A.2.2.						29,300			29,300
Supplemental-Bass Plate	A.2.1.							38,950		38,950
Supplemental-Rivers Plate	A.2.1.								35,100	35,100
Total—Supplemental							**29,300**	**38,950**	**35,100**	**103,350**
Grand total		**3,082,400**	**1,475,000**	**75,000**	**7,081,993**	**8,968,086**	**29,300**	**38,950**	**35,100**	**20,785,829**

WHAT WE DO

Fisheries Administration

The Administrative function of the Inland Fisheries Division occurs primarily at Texas Parks and Wildlife Department (TPWD) headquarters in Austin. The administrative staff provides critical leadership, strategic and operational planning, fiscal oversight, and administrative and managerial support to field offices that carry out the Division mission. The Inland Fisheries Division seeks to maximize collaborative efforts among its work groups to accomplish projects and to achieve the larger goals of the Division. These efforts, at least in part, are due to the close coordination of a small group of leaders who direct Division activities in the areas of fisheries management, aquatic resources conservation, permitting and consultations, fish production and stocking, fisheries research, analytical services, policies and procedures, regulations, and outreach.

Analytical Services

Analytical Services laboratories serve a unique function within Inland Fisheries by providing scientific analyses of water quality, fish pathology, and fish genetics. Analytical Services conducts a variety of analyses in support of divisional, interdivisional, and inter-agency programs. Analyses are routinely performed in support of ongoing monitoring, routine fish health inspection, disease diagnosis and treatment, program evaluation and focused research conducted by Inland Fisheries.

Hatcheries

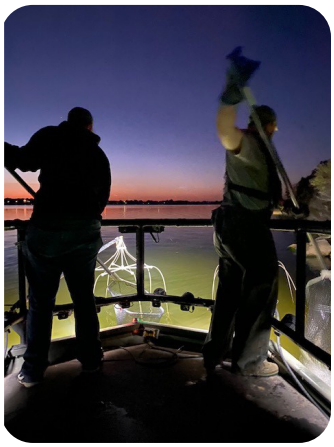
Hatcheries serve as an important component of Inland Fisheries resource management. Fish stocking is one of several essential tools used to protect, manage and enhance statewide fisheries resources as well as achieve specific fisheries resource objectives. Stocked fish must meet specific requirements including number, size, genetic integrity, disease-free status, and time of stocking. Hatchery-stocked fish are used to start new fish populations, supplement existing fish populations, restore depleted or threatened populations, provide fish in small urban lakes, enhance population genetics and performance, take advantage of improved habitat, and increase angler opportunities and success. Also, hatchery personnel are involved in outreach programs and agency-sponsored fishing events as well as providing educational hatchery tours to the public and students of all ages.

Hatchery teams operate from two regional offices (San Marcos, Graford), and five hatcheries (A.E. Wood Fish Hatchery in San Marcos, Dundee Fish Hatchery in Electra, East Texas Fish Hatchery in Brookeland, Possum Kingdom Fish Hatchery in Graford, Texas Freshwater Fisheries Center in Athens).

Fisheries Management and Conservation

The Fisheries Management and Conservation Branch monitors sport fish populations, fish habitats, and angler utilization in Texas rivers and lakes and recommends harvest regulations, fish stockings, fish habitat improvements, and other actions to sustain high-quality fishing experiences. Additionally, the Branch monitors the status and trends of Texas' 191 species of native freshwater fish, 52 species of native freshwater mussels, 54 species of native crayfish, and other freshwater taxa and implements actions to conserve the state's freshwater biodiversity. Branch teams accomplish these activities

through cooperation with angling organizations, local communities and municipalities, the fishing industry, property owners, river and lake authorities, other natural resources agencies, river conservancies, watershed alliances, and others.



Examples include the restoration, enhancement, and preservation of habitats in watersheds, springs, creeks, rivers, and lakes, as well as the management of aquatic invasive plants in lakes (e.g., giant salvinia, water hyacinth) and riverscapes (e.g., giant reed, saltcedar, elephant ear). The Branch also works with partners to improve and expand fishing, paddling, and boating opportunities through the delivery of programs such as Texas Paddling Trails, River Access and Conservation Areas, Habitat and Angler Access Program, Neighborhood Fishin', and the Guadalupe Bass Restoration Initiative. Branch teams assemble science-based and data-driven plans to guide and evaluate effectiveness in achieving fisheries management and conservation goals. Branch teams operate from three regional offices (Waco, Tyler, San Marcos), 14 district offices (Canyon, Wichita Falls, Abilene, Denison, Dallas-Fort Worth, Waco, San Angelo, San Antonio, Austin-San Marcos, Tyler, Marshall, Jasper, College Station-Houston, and Corpus Christi), the Texas River Center (located in San Marcos), and the Aquatic Habitat Enhancement Program office (located in Brookeland).

Fisheries Science and Policy

The Fisheries Science and Policy Branch develops, shares, and uses the best available science to inform policy, regulations, and programs that support the conservation and management of freshwater fisheries resources. The Branch coordinates Division-wide efforts to develop proposals for fishing regulation and exotic species rules changes, obtain public input on changes, and communicate proposals to the Parks and Wildlife Commission. Aquatic natural resource conservation efforts include consultations and technical guidance on development projects/permits, statewide permitting, coordinating responses to fish kills and pollution events, and investigating, restoring, and recovering damages to natural resources. The Branch coordinates aquatic invasive species policy and regulations as well as the agency's Aquatic Invasive Species Working Group, which leads efforts on prevention, management, and research. The Branch also furnishes data expertise for Division and Agency-wide assessments and disseminates general information to the public regarding fishing, access to public aquatic resources, and aquatic resource conservation.

The Heart of the Hills Fisheries Science Center in Mountain Home provides leadership, support, and coordination for Division research activities. They conduct intensive research investigations and give scientific guidance and support in the form of experimental design, statistical analyses, and literature, and develop science-based position papers that inform critical aquatic resource-related issues.

Texas Freshwater Fisheries Center

The Texas Freshwater Fisheries Center (TFFC) in Athens is a multipurpose facility that strives to provide educational experiences representing the breadth of the Inland Fisheries Division to the public. A main component of TFFC is serving as a working state fish hatchery that produces millions of fish each year to meet the stocking needs of fisheries managers. TFFC also serves as headquarters for the Toyota ShareLunker program and is home to the Texas Freshwater Fishing Hall of Fame. On average, 40,000 people visit the center annually; at least 14,000 of those are youth aged 12 and under. The visitor center is open to individuals and families six days a week in spring and summer, and five days a week in fall and winter. In addition, TFFC provides high-quality, intensive, hands-on outdoor and science educational experiences for K-12 students and educators. Special events are held throughout the year to encourage and enhance constituent participation. These activities result in connections to aquatic resources in Texas, information about Inland Fisheries management, conservation, and hatchery efforts, and great fishing experiences.

SUMMARY OF ACCOMPLISHMENTS

Aquatic Invasive Species Management

Invasive Mussel Monitoring and Prevention

- 43 water bodies are being monitored for early detection of zebra and quagga mussels and 28 for population monitoring
- Sampling involves a combination of environmental DNA analysis, plankton sampling, settlement samplers, and shoreline surveys
- At year's end, 31 water bodies across six river basins were fully infested with zebra mussels, having established populations, and this invasive species had been found multiple times in five additional water bodies
- A zebra mussel infestation was detected in Hords Creek Lake in Coleman County
- Zebra mussel larvae were detected in samples from Lake Amistad, where quagga mussel veligers had previously been detected repeatedly; no quagga mussel veligers have since been detected
- TPWD and partners continue to implement the Protect the Lakes You Love public outreach campaign to seek to slow the spread of aquatic invasive species

Invasive Carp Population Assessment

- TPWD, in collaboration with the Oklahoma Department of Wildlife Conservation and Arkansas Game and Fish Commission, oversaw completion by Auburn University and Texas Tech researchers of the third year of the first invasive bigheaded carp population assessment in the Lower Red River Basin. This study includes baseline population data for native fish assemblages.
- A two-year telemetry study to better understand the invasive carp populations began in FY23.
- Invasive Bighead and Silver carp were found in all Texas tributaries of the Red River with the exception of the Sulphur River
- Targeted outreach emails to local licensed anglers were used to aid in preventing new introductions

Aquatic Invasive Species Management

Inland Fisheries and partners continued to manage primarily nuisance aquatic vegetation throughout Texas' reservoirs and river systems. TPWD's Inland Fisheries' integrated pest management (IPM) plan was greatly expanded in late 2015 (FY16) as a result of record funding provided by the State Legislature. The IPM plan included installing floating booms, conducting herbicide treatments, and releasing biocontrol agents as well as employing an effective giant salvinia outreach campaign.

Herbicide treatments by TPWD and partners

- Treated 13,199 acres of giant salvinia in FY23 and nearly 125,000 acres of giant salvinia since the beginning of FY16.
- Treated 3,119 acres of water hyacinth in FY23 and nearly 17,000 acres of water hyacinth have been treated with herbicides since FY16.
- Treated 68 acres of hydrilla, focusing on public boat ramps, public fishing piers, and public swim beaches.

Mechanical treatments

- Floating booms
  - » Containment at lakes Athens, Houston County, and Raven
  - » Create weevil rearing sites at lakes Raven, Caddo, and Naconiche

Bio-control agent introductions

- Giant salvinia weevils
  - » TPWD released nearly 336,583 adult, giant salvinia weevils in Texas' public waters in FY22 and a total of nearly 2,570,200 adult, giant salvinia weevils since FY16.
  - » Self-sustaining populations are present in lakes Toledo Bend, Raven, Sheldon, Naconiche, and Nacogdoches.
  - » Weevils are currently the only control methodology used at Lake Nacogdoches.
  - » TPWD documented improved winter survival of giant salvinia weevils at Caddo Lake in FY23 but the weevil population later crashed when the giant salvinia was substantially reduced as a result of the December 2022 cold weather event.

Riparian Invasive Species Control

A variety of projects are underway to manage non-native, invasive plants that grow along the banks of Texas rivers and streams. When left unchecked, these invaders often crowd out native plants and may alter the aquatic food webs on which native fish depend. Severe growth may alter channel geomorphology, reduce stream flow, alter soil chemistry, worsen flooding, increase wildfire risk, and harbor other nonnatives such as feral hogs.

- TPWD manages and/or supports several riparian vegetation control projects in headwater rivers and streams of the Hill Country.
  - » Healthy Creek Initiative (Arundo)
  - » Nueces River Authority's Pull, Kill, Plant Project (Arundo)
  - » Llano River Elephant Ear Control
  - » Colorado Bend State Park Elephant Ear Control
  - » Lower Colorado River at Texas River School Arundo and Elephant Ear Control
- Currently, 723 landowner partners are enrolled in the Arundo management programs along 371 stream-miles of the Blanco, Guadalupe, Llano, Medina, Pedernales, Nueces, Frio, Dry Frio, Sabinal, and Leona rivers as well as San Felipe and Turkey creeks.
- In FY23, 72 stream-miles of elephant ear were treated along the upper Llano and South Llano rivers as well as Gorman Creek (99% reduction since 2017).
- To date, 181 landowner partners are enrolled in the Brazos River saltcedar management program along over 400 river miles stretching from near Lubbock to Possum Kingdom Reservoir.

Conservation of Species of Greatest Conservation Need

Texas hosts 191 native freshwater fishes, 54 species of crayfish, and 52 species of freshwater mussels, of which 89 fish, 12 crayfish, and 17 mussel species are currently listed as Species of Greatest Conservation Need (SGCN).

Inland Fisheries performs ecological research, conservation planning and assessments, species propagation, biological surveys and monitoring, habitat restoration, habitat protection, and other actions to ensure the continued ability of native freshwater taxa "to perpetuate themselves". Such actions are prioritized by the Division for freshwater fish, mussels, and benthic invertebrates including crayfish recognized within the Texas State Wildlife Action Plan as SGCN. Status as a SGCN is afforded to species with low or declining populations in need of conservation action, including species at risk due to threats to their life history needs or habitats; species considered rare due to few, small or declining populations, abundance, or distribution; and species with declining trends in their habitats and populations. Conservation actions performed to conserve SGCN help avoid further imperilment, loss, and extinction of native species and reduce the need for their listing as threatened or endangered.

During 2023, over 75% of freshwater fish and mussel species listed as SGCN in Texas received conservation investments by the Division to recover, restore, or preserve their populations.

Fish Habitat Conservation

Fish populations and quality angling opportunities depend upon healthy aquatic habitats in Texas creeks, rivers, and reservoirs. Texas fisheries face several challenges including sedimentation, loss of vegetation and coarse woody structure, water regime changes, nutrient loading, and invasive species that have resulted in varying degrees of degradation and lack of quality habitats. The Inland Fisheries Division collaborates with local, state, and federal agencies, private landowners, local communities, river authorities, fishing clubs, watershed alliances, and other organizations to design and implement aquatic habitat restoration, enhancement, and protection projects supported with external grants, collaborative cost-share programs, and intra-agency funding programs. Examples of fish habitat management efforts include native vegetation restoration, deployment of habitat structures in reservoirs, management of reservoir water levels to maximize the availability of spawning and nursery habitats, restoration and protection of riparian buffers, and management of aquatic invasive plants.

The Fish Texas largemouth bass conservation license plate supports habitat improvements and smaller angling access improvements in Texas public reservoirs. In 2023, 12 projects were supported with Fish Texas largemouth bass conservation plate funding. The Texas Rivers conservation license plate supports paddling access, riparian restoration, and invasive species management along Texas' streams and rivers. In 2023, TPWD Inland Fisheries finished the first cycle of projects (N=24) supported by the Habi-

tat and Angler Access Program (HAAP). The HAAP intends to expand efforts to address habitat impairments and deficiencies and address the increasing need for shoreline-based angler access. Additionally, three habitat projects were conducted in collaboration with the Brazos River Authority and local partners at Belton, Possum Kingdom, and Granbury reservoirs. In 2023, the Inland Fisheries Division was awarded a $275,000 Bass Pro Shops Conservation Grant from Bass Pro Shops and the National Fish Habitat Partnership to support habitat enhancement efforts at Ralph Hall Reservoir. Habitat enhancements will include the creation of a jetty and the installation of fish habitat structures.

The Habitat and Angler Access Program (HAAP) is a relatively new program that supports shoreline-based angler access improvements and fish habitat improvements in Texas' public inland waters. This program was conceptualized in FY21 and started in FY22, which 21 projects were selected for funding. Approximately, $500,000 was appropriated to support 13 internally planned projects and 11 external grant projects (See table 1 and 2 in the Appendix section FY22-23 HAAP Projects). All projects spanning approximately 23 waterbodies and several riparian areas were completed by the end of FY23. All project descriptions were made public on a website (https://tpwd.texas.gov/haap) and through a press release. Additionally, HAAP signage was posted at the project sites to promote the program and highlight the partnerships.

Several changes to the HAAP were completed prior to the next request for FY24-FY25 project proposals. These changes were intended to allow for better project planning and implementation, improved project selection, and increased efficiency for the contracting process:

- Updated scoring procedures and rubric
- Contracting improvements
- New member to the Scoring Committee
- Internal proposal submission process
- Removal of the external grant format

The request for proposals for the FY2024-FY2025 biennium was disseminated through a press release, word of mouth, and social media outlets during fall 2022, 16 proposals were submitted. Of the proposals submitted, 10 projects were selected for funding with anticipated matching dollars and in-kind support of $1,311,127.00 (See table 3 in the Appendix section FY22-23 HAAP Projects).

Fish Health Investigations

During FY2023, activities conducted by the Analytical Services Laboratory in San Marcos, TX (and collaborating laboratories) included the following:

- A total of 22 fish health cases analyzing approximately 1,184 fish samples for state hatchery fish health inspections for quality control/assurance, fish disease outbreak investigations in state waters and TPWD hatcheries, pathogen monitoring efforts, etc.
- A total of 190 water samples were processed for invasive Dreissenid mussels (zebra and quagga mussels) to detect microscopic larvae and/or environmental DNA (eDNA).
- A total of 182 samples were analyzed for Prymnesium parvum (golden alga) toxicity and presence in public water bodies.
- In addition, the laboratories completed 19 genetics projects with 2,600 samples.

Fish Stockings

A total of 13.1 million fingerlings were produced and stocked in public water. Species stocked included largemouth bass, Guadalupe bass, striped bass and hybrid striped bass, channel catfish, smallmouth bass, bluegill sunfish, rainbow trout and red drum. Rainbow trout are acquired from a commercial producer and red drum are produced by the Coastal Fisheries Division. Most of the fingerlings stocked were largemouth bass (41%) or either striped bass or hybrid striped bass (38%) which collectively comprise approximately 79% of the total number of fingerlings stocked. Hatchery staff drove more than 337,253 miles during more than 1,165 stocking trips to distribute the fish to more than 425 water bodies throughout Texas. Stocking Reports are available in the Appendix on page 17.

Fisheries Surveys

Reservoir Surveys

District management teams developed 45 reservoir management plans to guide their management efforts on these waters for their next 4-year cycle. Scientific observations and data from monitoring surveys were used to create these plans. Other reservoirs, under previous management plans were also monitored in FY23. Overall, the teams surveyed 106 public impoundments, covering 1,039,806 surface acres across the state. The following monitoring survey efforts were expended during FY23:

- 331 angler creel survey days
- 1,014 electrofishing stations (plus 18 stations on three lotic systems)
- 75 low-frequency electrofishing stations
- 453 gill-netting overnight sets
- 2 shoreline seining hauls
- 89 hoop-netting sets
- 221 trap-netting overnight sets
- 4 structural habitat surveys
- 64 aquatic vegetation surveys (plus two surveys on three lotic systems)

River Surveys

During FY23 staff conducted 263 surveys across 59 springs, streams, and rivers to assess the status of fish communities, freshwater mussels, benthic invertebrates, aquatic and riparian habitats, invasive species distribution, and recreational access and use.

Alexander Creek, Bayou Loco, Bear Creek, Bell Creek, Big Cypress Bayou, Big Elkhart Creek, Black Cypress Bayou, Blanco River, Bluff Creek, Bristow Creek, Caney Creek, Cedar Creek, Cibolo Creek, Cochino Bayou, Colorado River, Comanche Springs, Coyote Creek, Davis Creek, Dry Bayou, Dry Frio River, Elm Creek, Frio River, Guadalupe River, Hurricane Bayou, Jacks Creek, Jones Creek, Legg Creek, Leon River, Leona River, Linney Creek, Little Cypress Bayou, Loco Bayou, Lower Oyster Creek, Lynch Creek, McManus Creek, Medina River, Mill Creek, Morral Bayou, Neches River, North Creek, North Fork Red River, Nueces River, Paluxy River, Pecos River, Pedernales River, Piney Creek, Rio Grande River, Sabinal River, Saddlers Creek, San Bernard River, San Felipe Creek, San Marcos River, San Saba River, South Llano River, Varner Creek, Wallace Creek, West Fork Williams Creek, White Oak Creek, White Rock Creek

Surveys were used to inform river recreation, public access, sport fish management, and conservation activities and included invasive species control, riparian invasive species control, riparian vegetation recolonization, water management guidance, fish and freshwater mussel species distribution, aquatic

life use assessments, angler creel surveys, and game and non-game fish population monitoring. Focal species included Guadalupe Bass, Alligator Gar, American Eel, Devils River Minnow, Blue Sucker, Channel Catfish, Largemouth Bass, Smallmouth Bass, Smallmouth Buffalo, White Bass, and imperiled West Texas fishes.

Outreach

Texas is one of the fastest growing and increasingly diverse populations in the USA. In response to increases in the number and diversity of new Texans, TPWD created and approved an R3 plan (Recruitment, Retention, and Reactivation). The Inland Fisheries responsibilities in this plan include creating new and diverse fishing opportunities, creating more innovative outreach and educational programs, and making aquatic resources more accessible to new user groups. Combining the programs with innovative and engaging marketing campaigns and strategies should develop new users of the outdoors and assist in the accomplishments of the R3 plan goals.

Programs such as the Neighborhood Fishin', statewide Rainbow Trout stockings, and statewide applied habitat improvements implemented on urban waters results in new and improved fishing opportunities in major urban areas. The Texas Paddling Trails and River Access and Conservation Areas programs, along with HAAP and Conservation License Plate funding, improve public access to rivers and lakes and are making aquatic resources more available to all outdoor users.

The Texas Freshwater Fisheries Center (TFFC) is the primary outreach facility for the Inland Fisheries Division. TFFC is home to the Toyota ShareLunker Program, Angler Recognition Program, the Texas Division of the Fish Art Contest, and exhibits including 300,000 gallons of aquariums. TFFC's R3 efforts also include the development and participation in numerous outreach programs and events at TFFC and statewide in major urban areas.

Texas Freshwater Fisheries Center

- Texas Freshwater Fisheries Center (TFFC) is the Inland Fisheries Division's primary outreach and education facility. In FY 2023, TFFC provided facility tours, workshops, aquatic education classes, and other special events. Further TFFC is home to the statewide Toyota ShareLunker Program, Texas Division of the Fish Art Contest, Angler Recognition Program, and Texas Freshwater Fishing Hall of Fame.
- TFFC visitation included 40,495 people from 119 Texas counties, 45 states and 5 foreign countries. TFFC provided hands-on fishing for 22,615 visitors, with 846 receiving First Fish Awards. A total of 15,289 people toured the hatchery ponds via 502 guided tram trips.

Fish Art Contest

- The Fish Art Contest is organized by the national non-profit Wildlife Forever. The Texas Division is sponsored by Gulf States Toyota. The contest is designed to foster youth interest in fish, fisheries, and fishing. The program encourages K-12 students to submit original artwork of any fish and an essay or poem (grades 4-12) about their entry, its habitat, or efforts to conserve it.
- In 2023, 352 entries from grades K-12 were submitted to the program. All entries received certificates. The top 10 contestants in each of four grade divisions were recognized. The top 3 in each category had their work put on display as part of the Fish-Art exhibit at TFFC.

- First-place winners in each of the four age groups advanced to the national level and competed against winners from other states. Two Texas winners were announced as national 1st place winners by Wildlife Forever. Grace Cao's Guadalupe bass for the 7th through 9th grade category and Arim Jun's striped bass for the 10th through 12th grade category.
- TFFC staff participated in the selection of Wildlife Forever's "Richard M. Hart National Educator of the Year" award selection. The teacher is recognized as part of the Fish-Art exhibit at TFFC.
- A 2023 calendar was published highlighting the top three entries in each of the four grade categories from 2022.

Toyota ShareLunker Program

- The Toyota ShareLunker partners with anglers year-round (January 1 – December 31) to collect catch and genetic data on bass 8 pounds or 24 inches and larger, and to collect bass 13 pounds and larger during our ShareLunker collection season (January – March) for selective breeding.
- In FY 23, 552 entries from 90 lakes across the state were approved into the program. Of those entries: 353 were Lunker Class (8+ lbs.), 167 Elite Class (10+ lbs.), 14 Legend Class (13+ lbs.), 18 Legacy Class (13+ lbs. and donated for spawning).
- The 2023 collection season (January through March) was the busiest since 1995 when 27 were loaned to the program. This season pushed the program total Legacy Class collection to 632.
    - » A record 15 Legacy Class ShareLunkers for O.H. Ivie.
    - » Five fish weighing more than 14 pounds.
    - » Angler Kyle Hall recorded a Legacy Lunker in back-to-back seasons.
    - » Anglers Dalton Smith and Caden Cowan reeled in Legacy Lunkers at O.H. Ivie on the same day (Feb. 2).
    - » Anglers from seven states, including Texas, etched their name into the program's record book: Texas, Colorado, Kansas, Kentucky, Minnesota, New Mexico and Washington.
    - » ShareLunker 642 became the eighth-largest largemouth bass ever verified in Texas and the seventh-largest Legacy Class ShareLunker (public or private).
- The 2023 season continued the ShareLunker Response Team whose goal was to get Legacy Class lunkers more quickly and efficiently in the care and transportation of Inland Fisheries staff. Efforts of this team were successful. Anglers were provided faster service and the fish received better care quicker. Ultimately the quicker better fish health care ultimately led to survival of 100% of Legacy class lunkers.
- Hatchery staff successfully collected spawns from the Legacy Class lunkers loaned to the program this season. Hatchery staff produced and stocked 179,567 fingerlings from the selective breeding of the Legacy Class bass. A portion of the fingerlings were stocked into each of the reservoirs that loaned a Legacy Class fish.
- The Toyota ShareLunker continued to garner tremendous public interest.
    - » More than 66,000 anglers are signed up for ShareLunker email updates.
    - » More than 57,805 visits occurred to the ShareLunker website.
    - » ShareLunker Facebook page has more than 34,000 followers.
    - » A digital ad campaign resulted in 25,725 ad clicks, created 1,066,254 impressions, and 4,500 app downloads.

» Nearly 500 news articles, radio, tv, and online videos were created with resulted in a total reach of more than 3.45 billion.

Texas Freshwater Fishing Hall of Fame

- The Texas Freshwater Fishing (TFF) Hall of Fame was established in 1997 with a mission is to "recognize and honor those who have made a lasting contribution to freshwater fishing in Texas, and to foster a sense of appreciation, awareness and participation in the sport of fishing."
- In 2023, the TFF Hall of Fame selected professional angler Mr. Crappie Wally Marshall of Anna as the 38th member to be inducted.

Angler Recognition Program

- The Angler Recognition Program (ARP) maintains state record lists for public and private waters and water body records for all public lakes, rivers, and bays. Junior Anglers (under 17 years of age) compete in a separate division. The program issues certificates for several types of angler achievements.
- In this period, a total of 609 applications were received, with Big Fish Awards (287), Water Body Record (232), Junior Water Body Record (107), and Water Body Catch and Release Records (98) being the most submitted application categories.

Popular Articles and Social Media

Efforts to connect with our constituents can be achieved in many ways. Our diverse expertise across Inland Fisheries allows our team to utilize multiple outlets to deliver the essence of our mission and expose the public to our many successful programs and conservation commitments. Conservation is everyone's responsibility; so, engaging folks to our mission makes us relevant and supported within the community. These were different ways Inland Fisheries staff connected with the public through outreach efforts in FY 23:

- A total of 146 media coordination efforts, supporting press releases and popular articles, were conducted with TV, radio, news, and outdoor-related media outlets, regarding aquatic natural resource conservation, fisheries management, and recreational fishing opportunities.
- A total of 41 TPWD news releases were produced with the Communications Division about Inland Fisheries activities with each being distributed to nearly 4,400 media member contacts. Additionally, eight popular articles were written and published in newspapers, websites, and magazines.
- Inland Fisheries staff produced 646 social media posts for Facebook and Instagram, communicating Division interests from various programs. These posts reached 3.4 million+.

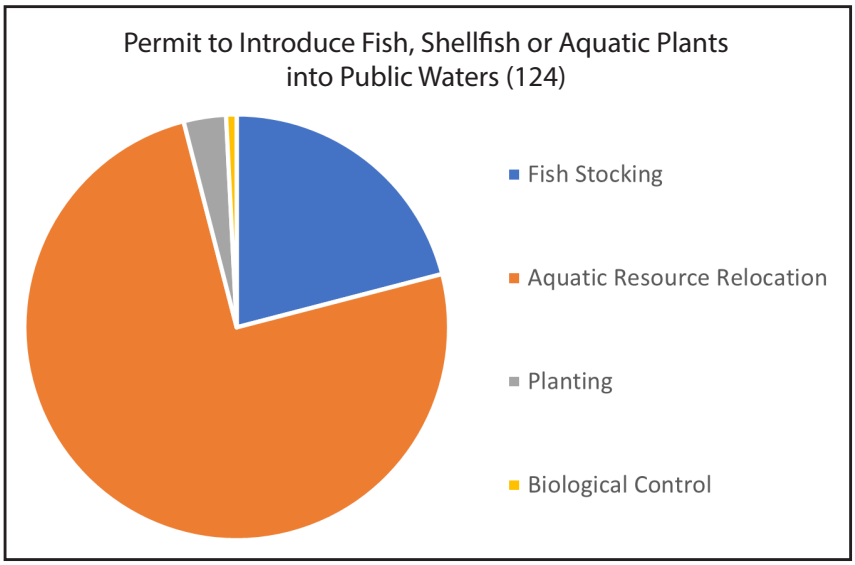
Events

- Inland Fisheries staff members were event leaders for 349 various local outreach events engaging 24,249 people. The events included youth and family fishing events and presentations to civic and conservation organizations.
- TPWD "Get Outside" events are cross-divisional efforts to provide a variety of outdoor education and activities for public enjoyment at key major events for the general public across Texas. Inland Fisheries developed outreach displays and materials and participated in all Get Outside events including the Texas State Fair, Ducks Unlimited Expo, Poteet Strawberry Festival, Mayfest, Baytown Nurture Nature Festival, and Austin Powwow. The Toyota ShareLunker Program outreach exhibit includes the Toyota Tundra ShareLunker collection truck and display trailer. This exhibit participated in major events that included the Texas High School Bass Association State Championship and Ducks Unlimited Expo.

TFFC Special Events and educational activities were developed and implemented to provide opportunities for the public to engage at all levels of experience and interest. These included kid's outdoor adventure camps, fly-fishing education classes, hunter's safety education, boater safety, Bass University 2 day pro angler seminar series, CAST for Kids, Deaf Day, Fishing with First Responders, Fireworks at the Fisheries, Fishing's Fools Day and Spawning Run, Fish Tag Friendzy event on Free Fishing Day, Library Day, Sunfish Showdown mentored fishing tournament on National Hunting Fishing Day, Halloween at the Hatchery, Veteran's Day event, Ethelsgiving, First Fish Fridays, and Merit-Badge University.

Permits

Inland Fisheries issued 124 permits to introduce fish into public waters:



Staff issued 1,199 permits (including renewals) authorizing possession of prohibited exotic fish, shellfish or aquatic plants for the purpose of:

- Invasive plant management (7)
- Fish/shrimp aquaculture (30)
- Stocking Triploid Grass Carp (1,080)
- Culture of water spinach as a food source (40 issued and 2 denied)
- Research (6)
- Zoological display (12)
- Pond Stocking Sales (23)
- Biological Control Production (1)

Staff issued 49 permits for commercial harvest of nongame fishes from public fresh waters.

Fourteen of 17 requests to stock tilapia in private ponds in the Conservation Zone were approved.

Three sand and gravel permits were issued. Staff also approved 403 Aquatic Vegetation Treatment Proposals and conducted 43 reviews of water-related documents, grants and projects.

No permits authorizing Interstate Transit of an exotic species or Broodstock collection were issued.

Regulation Updates

The following regulation changes were adopted by the Texas Parks and Wildlife Commission to improve angling opportunities and protect fisheries resources.

Community Fishing Lakes

- Modify the definition of and fishing regulations for Community Fishing Lakes (CFLs) as follows:
  - » Clarify that CFLs include all public impoundments 75 acres or smaller that are located totally within incorporated city limits or a public park, including municipal, city, county, or state parks. The new definition will exclude impoundments greater than 75 acres that are totally within the boundaries of state parks.
  - » Remove special exceptions for blue and channel catfish and remove statewide daily bag, possession, and length limits for other species of fish to implement a daily bag limit of five (all species combined) with one black bass 14 inches or greater in length.
  - » Continue largemouth bass special exceptions for five CFLs.
  - » Clarify the pole-and-line restrictions for CFLs, state park lakes, and Deputy Darren Goforth Park Lake.

Bag, Possession, and Length Limits

- Changes to CFL regulations require modifications to catfish regulations for three state park lakes: Abilene (Taylor County), Raven (Walker County), and Sheldon (Harris County) to remove special exceptions for blue and channel catfish and remove statewide daily bag, possession, and length limits for other species of fish to implement a 14-inch minimum length limit and daily bag limit of 15. These lakes require more restrictive catfish regulations due to limited natural reproduction.
- Apply the CFL fishing regulations to seven waterbodies that are managed consistently with CFLs to remove special exceptions for blue and channel catfish and remove statewide daily bag, possession, and length limits for other species of fish to implement a daily bag limit of five (all species combined) with one black bass greater than 14 inches.
- Modify largemouth bass harvest regulations for Lake Nasworthy (Tom Green County) to eliminate special exceptions (14- to 18-inch slot length limit) to statewide daily bag, possession, and length limits and return to statewide regulations. Based on fisheries data at Lake Nasworthy, no change in largemouth bass abundance, size structure, or growth was detected after implementation of the slot limit. Harvest of largemouth bass is low, and the harvest of largemouth bass under the slot length limit is needed to restructure the population. Based on an online angler opinion survey, most anglers support returning to the statewide regulations.
- Implement a largemouth bass catch-and-release regulation for the newly renovated Lake Forest Park (Denton County, City of Denton). Recent renovations included dam replacement, silt removal, fish habitat improvements, and fish stocking. It is important to provide protection to initial year-classes of stocked largemouth bass to develop a quality, self-sustaining largemouth bass population.
- Remove fishing regulations for Gibbons Creek Reservoir. This reservoir is privately owned and no longer open to the public.
- Modify catfish harvest regulations for Dixieland Lake (Cameron County) to remove special exceptions for blue and channel catfish and remove statewide daily bag, possession, and length limits for other species of fish to implement a daily bag limit of five (all species

combined) with one black bass greater than 14 inches. Dixieland Lake's size has been reassessed, and it is classified as a CFL.

- Modify catfish harvest regulations for Bellwood (Smith County) and Tankersley (Titus County) lakes to eliminate special exceptions to statewide daily bag, possession, and length limits for blue and channel catfish and return to statewide regulations.

Reservoir Boundaries

- Delineate the upstream reservoir boundaries for Choke Canyon Reservoir (Live Oak and McMullen counties) and O.H. Ivie Reservoir (Coleman, Concho, and Runnels counties) to differentiate between the inflowing river and the reservoir where special exceptions to statewide daily bag, possession, and length limits are in place.
- Correct the upstream reservoir boundary road name for Lake Conroe (Montgomery and Walker counties).

Research

- Initiated, conducted, or completed 37 internal and 67 collaborative applied research studies to inform management and conservation actions (see Appendix – Active Research Studies)
- Authored 16 scientific articles that were published in twelve different peer-reviewed journals and two books (see Appendix – Scientific Publications and Reports)
- Contributed to 35 scientific presentations given at five professional conferences

APPENDIX

Stocking Reports

Species	Adult	Fingerling	Fry	Total
Black crappie	4,000			4,000
Blue catfish		653,869	176,552	830,421
Bluegill	614	313,772		314,386
Channel catfish	2,648	475,856	452,173	930,677
Florida largemouth bass	30			30
Guadalupe bass		10,098	7,074	17,172
Largemouth bass	55			55
Lone Star Bass		6,197,722	504,906	6,702,628
Longear sunfish	50			50
Palmetto Bass (striped X white bass hybrid)			4,945,614	4,945,614
Rainbow trout	369,138			369,138
Red drum		1,035,401		1,035,401
ShareLunker largemouth bass	151	179,557		179,708
Smallmouth bass	308	212,253	9,230	221,791
Striped bass		939,948		939,948
Sunshine Bass (white bass x striped bass hybrid)		2,304,366	1,083,307	3,387,673
Walleye		11,350	3,160,326	3,171,676
Totals	**376,994**	**12,334,192**	**10,339,182**	**23,050,368**

FY22-23 HAAP Projects

Table 1. Internal Projects funded and completed during FY2022-FY2023 biennium.

	Project	Management District	Project Type	HAAP Funds
1	Riparian Restoration & Bank Re-stabilization on the Paluxy River in Dinosaur Valley State Park	Waco	Both	$18,150
2	Small Craft and Shoreline Access on Middle Bosque on Lake Waco	Waco	Access	$10,000
3	Lake Murvaul Native Vegetation Restoration	Marshall	Habitat	$10,000
4	City of Early Town Center Pond Renovation	Abilene	Habitat	$45,000
5	Aeration and Water Quality Improvements in Dallas-Fort Worth Community Fishing Lakes	DFW	Habitat	$30,000
6	Lake Dunlap Reservoir Habitat Restoration Project	Corpus Christi	Habitat	$15,000
7	Zuni Bowl Erosion Control Project	San Antonio	Habitat	$7,500
8	San Felipe Creek Riparian Restoration Project	San Angelo	Habitat	$21,000
9	Miller's Pond Aerator	San Antonio	Habitat	$5,000
10	DFW CFL Shoreline Riprap	DFW	Habitat	$7,000
11	Gordon Lake Shoreline Riprap	Wichita Falls	Habitat	$4,000
12	Lake Murvaul Plant Nursery Improvements	Marshall	Habitat	$5,000

Table 2. Projects funded by external grant and completed during FY2022-FY2023 biennium.

	Project	Management District	Project Type	HAAP Funds
1	City of Early Town Center Pond Fishing Piers Project	Abilene	Access	$60,000.00
2	Little Elm Kayak Angler Access Project	Dallas-Fort Worth	Access	$50,000.00
3	Lake Wichita Kayak Launch	Wichita Falls	Access	$31,500.00
4	TX River School Camp Paddling Access Improvements	San Marcos/Austin	Access	$51,000.00
6	Bandera Angler Park Access Improvements	San Antonio	Access	$60,000.00
7	Central TX Reforestation Program	San Marcos/Austin	Habitat	$50,000.00
8	Resoft Park Fish Habitat Enhancement	College Station/ Houston	Habitat	$6,000.00
9	Lake Fork Habitat Enhancement	Tyler	Habitat	$15,269.00
10	Longhorn Shores - Lady Bird Lake Habitat & Access	San Marcos/Austin	Both	$20,800.00
11	Hidalgo Pump House Channel Habitat & Access Project	Corpus Christi	Both	$48,500.00

Table 3. Projects selected for the FY2024-FY2025 biennium.

	Project	District	Project Type	Funds	Match/ In-kind
1	MediPark Fishing Pier	Amarillo	Access	$53,000.00	$25,000.00
2	Livingston Fishing Pier	Jasper	Access	$50,000.00	$15,000.00
3	Runaway Bay - Lake Bridgeport Fishing Pier	Dension	Access	$83,000.00	$60,210.00
4	Hill at Cims Habitat and Access	B/CS-H	Both	$83,750.00	$789,344.00
5	City of Early Kayak Launches	Abilene	Access	$45,250.00	$ 53,000.00
6	Millers Pond Fishing Pier	San Antonio	Access	$35,000.00	
7	Upper San Marcos Riparian Invasives Control (AIS Funds)	San Marcos	Habitat	$50,000.00	$10,000.00
8	TreeFolks Revegetation Project	San Marcos	Habitat	$65,000.00	$401,073.00
9	Garner State Park Riparian Stabilization	San Antonio	Habitat	$6,000.00	$500.00
10	Iraan Access and Habitat Project	San Antonio	Both	$42,000.00	$10,000.00

Active Research Studies

INTERNAL RESEARCH
(FUNDED WITH SPORT FISH RESTORATION OR STATE FUNDING)

- Spatial patterns of Guadalupe Bass x Spotted Bass hybridization in Texas rivers. Preston Bean, Dijar Lutz-Carrillo, Nate Smith, and Paul Fleming.
- Trajectory of habitat and fish assemblages in the Llano River watershed following a large-scale flood. Preston Bean.
- Abundance and movement of juvenile and adult Guadalupe Bass in headwater streams on the Edwards Plateau. Nate Smith and Paul Fleming.
- Use of fine-scale population abundance and genetic data to inform Guadalupe Bass restoration stocking. Nate Smith, Paul Fleming, and Dijar Lutz-Carrillo.
- Spatial distribution and habitat association of fishes at the river-reservoir ecosystem scale. Paul Fleming, Dave Buckmeier, Nate Smith, Archis Grubh, Sarah Robertson, and Michael Homer.
- Inland and coastal Alligator Gar: do differences warrant local-scale management? Dan Daugherty, Paul Fleming, Michael Baird, and Clint Robertson.
- *Morone* fry early feed utilization and feed transitions. Neil Pugliese, Mike Matthews, Reese Sparrow, and Ryan Rogers.
- *Morone* fry deformities as related to maternal stress. Mike Matthews, David Prangnell, and Hugh Glenewinkel.
- YY male carp broodstock development – feminization protocol for carp. Carl Kittel and Mike Matthews.
- Effects of spawning structure on Smallmouth Bass spawn success in raceways and fry production. Reese Sparrow and Zachary Zemanek.
- Use of ozonated water for Phase 1 Striped Bass production: effect of two pond filling strategies on pond production performance. Ryan Rogers.
- Comparison of egg size and volume from wild caught and F1 domestic Striped Bass broodstock. Ryan Rogers and Courtney Thompson.
- Comparison of inorganic and organic fertilizing strategies for use with filtered and sterilized production pond water. Courtney Thompson and Ryan Rogers.
- Effects of feeding regimes on the proximate composition and condition indices of Koi used as forage. Donovan Patterson and David Prangnell.
- Comparison of early growth rates of Florida Bass fry compared to ShareLunker offspring fry. Elizabeth Foster and Donovan Patterson.
- Impact of forage feeding rate on Florida Bass broodfish spawning. Donovan Patterson and Carl Kittel and Delbert Gatlin (TAMU).
- Effects of selected oxidants on *Prymnesium parvum* cell density and toxicity. Greg Southard.
- ShareLunker and Florida Bass genetic research. Dijar Lutz-Carrillo.
- Population structure and hybridization in Headwater Catfish. Dijar Lutz-Carrillo, Megan Bean, Josh Perkin and Stephanie Parker (TAMU).
- Population structure and hybridization in west Texas Gambusia and Cyprinodon species. Dijar Lutz-Carrillo and Megan Bean.

- Sequencing of the Florida Bass genome. Dijar Lutz-Carrillo.
- Identifying native lineages of Largemouth Bass in Texas. Dijar Lutz-Carrillo.
- Evaluation of hybrid Striped Bass stocking rates, relative abundance, and angler distribution in Texas reservoirs. Lynn Wright and Tim Bister.
- Evaluation of growth and survival of standard hatchery produced and selectively bred Florida Largemouth Bass: implications for stocking success and efficiency. Greg Binion and Muhktar Farooqi.
- Blue and Channel Catfish growth, mortality, and gill net selectivity in Texas reservoirs. Lynn Wright, Michael Homer, John Tibbs, Greg Binion, Greg Cummings, and Quintin Dean.
- Effects of PVC cube habitat structures on angling success in an urban reservoir. Cynthia Holt and Kris Bodine.
- Population assessment of the Alligator Gar in the lower Brazos River, Texas. Michael Baird.
- Evaluation of the utility of self-reported creel survey data using smartphone technology. Natalie Goldstrohm and John Clayton.
- Comparison of recruitment, growth, and catch of Palmetto Bass and Sunshine Bass fingerlings in Texas. Michael Homer Jr., Robert Mauk, John Tibbs, and Rafe Brock.
- Evaluation of ghost-fishing of abandoned trotlines in a Texas reservoir. Dusty McDonald,
- Comparison of catfish harvest between anglers using active and passive angling gears in a Texas reservoir. Greg Binion.
- Economics and characteristics of large (>200) fishing tournaments at Lake Fork Reservoir. Dan Bennett, Jake Norman, Kevin Storey, and Todd Driscoll.
- Recruitment success of fry-stocked hybrid Striped Bass in Texas reservoirs. Jake Norman.
- Habitat use and movement of Largemouth Bass at Toledo Bend and Lake Fork Reservoirs. Todd Driscoll and Jake Norman.
- Assessing the impact of forward-facing sonar (FFS) utilizing creel data within Texas reservoirs. David Smith, Jake Norman, and Dan Bennett.
- Methodology development of using camera traps for *Cyprinodon* monitoring. Robert Mollenhauer, Megan Bean, Dominik Chilleri, Preston Bean, Josh Perkin (TAMU), and Matt Acre (USGS).
- Assessment of impacts to mussel community structure from a new wastewater discharge in the Sabine River. Clint Robertson and Adam Whisenant.

COLLABORATIVE RESEARCH WITH EXTERNAL PARTNERS

Funded with USFWS State Wildlife Grant

- Assessing the fishery and economic value of a restored Guadalupe Bass population. Jeff Hutchinson (UTSA), Randy Myers, Mitch Nisbet, and Gordon Linam.
- Assessing the restored Guadalupe Bass population in the Mission Reach, San Antonio. Matt Troia (UTSA), Randy Myers, Mitch Nisbet, and Gordon Linam.
- Alligator Gar population connectivity and habitat use in the Trinity River National Wildlife Refuge. David Hoeinghaus and Wesley Homan (UNT), Nate Smith, Dan Ashe, and Clint Robertson.

- Multiscale thermal vulnerability for fishes in urbanizing, spring-influenced streams of central Texas. Matt Troia and Nick Loveland (UTSA), Marty Kelly (CF), David Young , Warren Schlechte, and Nate Smith.
- Evaluating resilience and vulnerability of fish assemblage structure to intermittent flow. Jane Rogosch (TTU/USGS), Cienna Hanson (TTU), Nate Smith, and Clint Robertson.
- Identifying environmental flow thresholds for fish species and communities in Texas. Ryan McManamay and Ryan King (Baylor), Ryan Smith (TNC), Kevin Mayes, David Young, and Preston Bean.
- Distribution, abundance, and current status of Llano River Carpsucker. Josh Perkin, Gary Voelker, Kevin Conway, and Hayden Roberts (TAMU), Henry Bart (Tulane), and Preston Bean.
- Assessing the swimming performance of Species of Greatest Conservation Need fishes of the Guadalupe River to inform stream crossing design and barrier prioritization. Ed Mager and Cameron Emadi (UNT), and Preston Bean.
- Developing and validating bioenergetics models for Guadalupe Bass. Matthew Troia (UTSA), Preston Bean, and Mitch Nisbet.
- Lateral movements and tributary habitat uses of Alligator Gar in the Middle Brazos River. Josh Perkin and Hayden Roberts (TAMU), Matt Acre (USGS), and Dan Daugherty.
- Surveys for Ephemeroptera, Plecoptera, and Trichoptera Species of Greatest Conservation Need. Lance Williams, Marsha Williams, Matthew Greenwold, and Alexander Beemer (UT Tyler), and Archis Grubh.
- Risk assessment and conservation of five narrowly endemic crayfish in eastern Texas. Christopher Taylor and Dusty Swedberg (Illinois Natural History Survey), and Archis Grubh.
- Evaluation of population persistence for *Popenaias popeii*, Texas Hornshell, in the Devils River. Charles Randklev (TAMU Natural Resource Institute) and Clint Robertson.
- Host fish use, reproduction, and propagation potential of two East Texas threatened mussel species. Charles Randklev (TAMU Natural Resource Institute) and Clint Robertson.
- Developing conservation action decision support tool from the NatureServe Rank Calculator. Charles Randklev (TAMU Natural Resource Institute) and Clint Robertson.
- Mussel age validation. Charles Randklev (TAMU Natural Resource Institute) and Clint Robertson.
- Examining the conservation status of freshwater mussels in Texas. Charles Randklev (TAMU Natural Resource Institute) and Clint Robertson.
- Examining trematode infestations at mussel biodiversity hotspots throughout the state. Charles Randklev (TAMU Natural Resource Institute) and Clint Robertson.
- Population genomics in imperiled mussels and their hosts in the Guadalupe River. Mark Kirkpatrick and Chase Smith (UT), and Clint Robertson.
- Conservation status and life history of imperiled fish species East Texas streams. Carmen Montaña-Schalk (SFASU), Bjorn Schmidt (TAMU Commerce), Stephen Curtis, and Kevin Mayes.
- Gap sampling within the Texas Native Fish Conservation Areas Network. Dean Hendrickson and Adam Cohen (UT), Melissa Casarez, Sarah Robertson, and Stephen Curtis.
- American Eel: Utilizing modern techniques to assess conservation status in Texas. Dean Hendrickson (UT), Stephen Curtis, and Melissa Casarez.

- Extensive field effort using a novel gear type to detect recruitment of American Eel (*Anguilla rostrata)* in Texas. George Guillen (UHCL), Jenny Oakley (UHCL), and Stephen Curtis.
- American eel ramp network. George Guillen (UHCL) and Stephen Curtis.
- Assessment and prioritization of barriers in the Upper Guadalupe River upstream from Canyon Reservoir, Texas – a pilot project. Kimberly Meitzen (TXST), Jessica Graham (SARP), Kathleen Hoenke (SARP), and Stephen Curtis.
- Assessment of *Gila pandora* in Little Aguja Creek (Davis Mountains), Texas. Scott Collins (TTU), Jane Rogosch (TTU/USGS), and Megan Bean.
- Implementing conservation delivery and developing conservation networks for Species of Greatest Conservation Need in the Chihuahuan Desert. Jeff Bennett (Rio Grande Joint Venture) and Megan Bean.
- Population genetic structure of five Species of Greatest Conservation Need in the Pecos and Devils Rivers. Kevin Conway (TAMU), David Portnoy (TAMU Corpus Christi), and Megan Bean.
- Distribution and species distribution modeling of Headwater Catfish. Josh Perkin (TAMU) and Megan Bean.
- Temporal trajectories and landscape correlates for stream fish community change in central and west Texas. Josh Perkin (TAMU) and Megan Bean.
- Distance sampling and species distribution modeling of Conchos Pupfish. Josh Perkin (TAMU) and Megan Bean.
- Food habitats of Species of Greatest Conservation Need fishes to inform habitat assessment and restoration in the Red River Basin. Scott Collins (TTU), Jane Rogosch (TTU/USGS), Bart Durham (Lubbock Christian), and Sarah Robertson.
- Hydrologic monitoring of priority habitats in the Devils River. Jon Paul Pierre (UT Bureau of Economic Geology) and Sarah Robertson.
- Airborne Lidar bathymetry survey and aquatic habitat evaluation for Devils River Minnow and Texas Hornshell Mussel in the Devils River. Brian Hunt (UT Bureau of Economic Geology) and Sarah Robertson.
- Cypress paired-watershed eflow refinement – Caddo Cypress Riparian Stewardship. T. Hayes (TCS) and Kevin Mayes.
- Assessing ammonia toxicity of Texas unionid mussels. Astrid Schwalb (TXST), Somerley Swarm (USFWS), Lee Gudgell (GBRA), and Clint Robertson.
- Riparian productivity in three Texas river basins. Tom Hayes (Texas Conservation Service) and Kevin Mayes.

Funded with USFWS Section 6

- Distribution and habitat use of Kisatchie Painted Crayfish in northeast Texas with investigation of multi-scale environmental influences on crayfish community structure. Matt Barnes (TTU), Allison Pease (formerly TTU), and Paul Fleming.
- Geomorphic and sediment analysis of the upper Brazos River in response to saltcedar control. Kimberly Meitzen and Samantha Krause (TXST), Monica McGarrity, and Kevin Mayes.
- Quantification of physiological performance and other functional traits of plains fishes in support of mechanistic management and conservation. David Hoeinghaus and Ed Mager

(UNT), Nate Smith, and Megan Bean.

- Assessing acute and chronic thermal sensitivity and exposure of spring-associated fishes. Matt Troia and Garrett Tucker (UTSA), Warren Schlechte, Nate Smith, and Sarah Robertson.
- Fish assemblages of the Rio Grande between Eagle Pass and Laredo, Texas. Chris Taylor (UTRGV) and Megan Bean.
- Conservation genomics of Pecos Pupfish (*Cyprinodon pecosensis*). David Portnoy (TAMU Corpus Christi), Kevin Conway (TAMU), Joanna Hatt (NMDGF), and Megan Bean.
- Ecological forecasting and conservation contingency planning for imperiled Great Plains fishes in Texas. Joshua Perkin (TAMU) and Kevin Mayes.
- Measuring and predicting movement ecology for imperiled Great Plains fishes in Texas. Joshuah Perkin (TAMU) and Kevin Mayes.
- Impact of hydrologic alteration on Brazos River pelagophilic minnows. Christopher Taylor (UTRGV) and Kevin Mayes

Funded with USFWS Sport Fish Restoration

- Use of lapsed-angler focus groups to inform R3 efforts. Sherry Matthews Group, Kris Bodine, Paul Fleming, Warren Schlechte, John Taylor, Dan Daugherty, Zack Thomas (CF), and TPWD Communications.
- Survey of anglers in Texas that recruited during the COVID pandemic. Sherry Matthews Group, Warren Schlechte, John Taylor, Kris Bodine, Dan Daugherty, Zack Thomas (CF), and TPWD Communications.
- Dimensions of diversity in urban fisheries: examining habitat, fish, and anglers to inform the management of Texas Community Fishing Lakes. Scott Collins and Travis Ausec (TTU), Warren Schlechte, Rafe Brock, Caleb Huber, and Preston Bean.
- Economic impacts of Lake Texoma recreational fishing. Rebekka Dudensing (TAMU AgriLife), Andrew Ropicki (UFL/Florida Sea Grant), Dan Bennett, and Matt Mauck (ODWC).

Funded with State Aquatic Invasive Species

- Assessing abundance, sex ratio, and space use by suckermouth armored catfish to enhance control efforts. Josh Perkin (TAMU), Thomas Heard (TXST Meadows Center), Dan Daugherty, and Monica McGarrity.
- Near real-time detection and monitoring of invasive mussel species in Texas waterways. Greg Hamerly and Ryan McManamay (Baylor), and Monica McGarrity.
- Assessing the population dynamics and body condition of Zebra Mussels within and between two Texas water bodies with different population trajectories: Lakes Belton and Stillhouse Hollow. Jason Locklin (Temple College), Brian Van Zee, and Monica McGarrity.
- Using remote sensing to map *Arundo donax* populations in Native Fish Conservation Areas throughout Texas to better understand causal factors of invasion and set management priorities. Jason Martina (TXST) and Monica McGarrity.
- Assessing pathways of introduction of non-native fishes (Sheepshead Minnow: C*yprinodon variegatus* and Gulf Killifish: *Fundulus grandis*) in Texas streams. Carmen Montaña-Schalk (SFASU), Joshuah Perkin (TAMU), Kevin Mayes, and Monica McGarrity.

- Evaluating the suppression of *Hydrilla verticillata* by manual removal and planting native aquatic plants. Jeffrey Hutchinson (UTSA), Sarah Haas, and Monica McGarrity.
- Growth, survival, and reproductive success of zebra mussels. Michael Misamore (TCU), Sarah Haas, and Monica McGarrity.
- Impact of zebra mussels on unionid mussels, population dynamics and limiting factors for growth and survival. Astrid Schwalb (TXST) and Monica McGarrity.
- Monitoring of hydrologic effects of saltcedar control in the upper Brazos River Basin, Texas. Tyson McKinney, Tara Bongiovanni, Jon Paul Pierre, and Michael Young (UT Bureau of Economic Geology), Kevin Mayes, and Monica McGarrity.
- Assessment of passive revegetation of upper Brazos River Basin saltcedar management sites. Tom Hayes (Texas Conservation Science) and Monica McGarrity.
- Geomorphic characteristics of the upper Brazos River in response to invasive saltcedar management. Kimberly Meitzen (TXST), Kevin Mayes, and Monica McGarrity.

Miscellaneous Funding

- Distribution and Population Demographics of Asian Carp in the Lower Red River Basin. Shannon Brewer (Auburn), Scott Collins (TTU), and Monica McGarrity. Funding – USFWS Invasive Carp
- Zebra mussel monitoring in Texas water bodies. Astrid Schwalb (TXST), and Monica McGarrity. Funding – USFWS ANS Management Plan Implementation
- Population structure of Pecos Pupfish. Joanna Hatt (NMDFG) and Megan Bean. Funding – New Mexico Department of Game and Fish
- Conservation of Diamond Y Preserve and management of aquatic resources. Ryan Smith (TNC) and Megan Bean. Funding – National Fish and Wildlife Foundation.
- Examining OTC uptake and visible staining in calcified structures of fishes. Derek Crane (CCU), Meredith Pfennig (CCU), Nate Smith, and Dave Buckmeier. Funding – Coastal Carolina University
- Hydraulic connectivity to riverine habitats in the Colorado and Lavaca basins. Tom Hayes (Texas Conservation Science), Dan Daugherty, and Kevin Mayes. Funding – Texas Water Development Board

Scientific Publications and Reports

Acre, M. R., T. B. Grabowski, D. J. Leavitt, N. G. Smith, A. A. Pease, P. T. Bean, and P. D. Geeslin. 2023. Mismatch between temperature and discharge disrupts spawning cues in a fluvial specialist, blue sucker *Cycleptus elongatus*. Ecology of Freshwater Fish 32:305-321. https://doi.org/10.1111/eff.12687

Benavides, J. A., J. Karges, K. B. Mayes, H. S. Rifai, and C. V. Castro. 2023. Chapter 5 – Gulf coast rivers of the southwestern United States. Pages 176-224 *in* M. D. Delong, T. D. Jardin, A. C. Benke, and C. E. Cushing editors. Rivers of North America (Second Edition), Academic Press. https://doi.org/10.1016/B978-0-12-818847-7.00012-4

Hays, H. C., Pease, A. A., Fleming, P. and Barnes, M. A. 2023. Distribution and habitat use of a rare native crayfish: Implications for conserving Data Deficient species. Aquatic Conservation: Marine and Freshwater Ecosystems 33:751-760. https://doi.org/10.1002/aqc.3971

Lutz-Carrillo, D., J. W. Schlechte, J. Norman, and D. L. Bennett. 2023. Lineage and hybridization effects on size potential in the Largemouth Bass complex. Transactions of the American Fisheries Society 152:145-168. https://doi.org/10.1002/tafs.10395

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Work with Other Organizations

Program Contracts and Agreements

729 Properties, LLC	Leased Access on the San Marcos River	$20,040.00
American Bird Conservancy	Implementing Conservation Delivery and Developing Conservation Networks for Species of Greatest Conservation Need in the Chihuahuan	$12,213.08
American Fisheries Society	The Hutton Junior Fisheries Biology Program	$10,000.00
Private Landowner	LIP Project - Bush Management, Enclosures, and Erosion Control under the WL Landowner Incentive Program	$2,692.60
Angelina-Nacogdoches Counties WCID # 1	Control of giant salvinia Salvinia molesta and other aquatic or riparian plant species in Lake Striker	$25,000.00
Auburn University	Evaluating the spatial and temporal distribution, ecology, and movement of Bighead and Silver Carp and native fishes of the Lower Red River basin	$347,094.19
Baylor University	Near real-time detection and monitoring of mussel species in Texas waterways	$49,800.00
Baylor University	Identifying environmental flow thresholds for fish species and communities in Texas	$31,245.07
Brazoria County	Resoft County Park Shoreline Habitat Improvement	$6,000.00
Brazos River Nature Center	Angler and Boater Access to the Brazos River	$12,000.00
Caddo Biocontrol Alliance Inc	Biological Control of giant salvinia in Caddo Lake and other public water bodies containing giant salvinia	$30,000.00
Charlotte Nadine Hopson	Angler and Boating Access to the LLano River	$9,000.00
CHS Camping LLC	Angler lease access for the Guadalupe River at Camp Huaco Springs	$2,600.00
City of Bandera	Bandera Angler Park	$40,000.00
City of Early	Town Center Pond Renovation and Angler Access Project	$84,500.00
City of Hidalgo	Old Hidalgo Pump House Channel Angler Access and Habitat Improvement Project	$4,038.76
City of Wichita Falls	Lake Wichita Kayak Launch for Shoreline and Bank Angler Access	$0.00
Private Landowner	LIP Project	$999.08
Coastal Water Authority	Control of water hyacinth Eichhornia crassipes and other aquatic or riparian plant species in Lake Houston and its tributaries	$30,000.00
County of Uvalde	Cooksey Park Angler Access	$30,000.00

Cypress Valley Navigation District	Boat lane maintenance and boater access on Caddo Lake and Big Cypress Bayou	$35,000.00
Fishing's Future	George H.W. Bush Vamos A Pescar	$10,000.00
Guadalupe-Blanco River Authority	Control of water hyacinth Eichhomia crassipes and other aquatic or riparian plant species in the Lower Guadalupe River and lakes Placid, Gonzales, Wood, and Coleto Creek Reservoir	$25,000.00
Hill Country Alliance	Restoration, Landowner Outreach, and Community Engagement for Control of Arundo and Stewardship of Hill Country Rivers	$103,950.00
Jean S Weinkauf DBA Dick's Canoes	Angler Access to the Brazos River	$9,000.00
Private Landowner	LIP Project - Pecos Pupfish Production Pond	$8,873.21
Joana Laake DBA Pete's Pecan Patch	Leasing Access by Anglers to the Llano River	$9,000.00
John William Fuller	Leased Access for Anglers and Boaters on the Brazos River	$1,000.00
Karrie Lera Mckeown	Angler and Boating Access to the Colorado River	$9,000.00
Lake Fork Sportsman's Association	Lake Fork Habitat Enhancement	$6,218.67
Lavaca-Navidad River Authority	Control of water hyacinth, Eichornia crassipes, giant salvinia, Salvinia molesta, and other invasive aquatic or riparian plant species in Lake Texana and it tributaries	$50,000.00
Llano River Watershed Alliance	Control of water hyacinth Eichornia crassipes, giant salvinia, Salvinia molesta, and crested floating heart, Nymphoides hydrophylla, on Sam Rayburn and B.A. Steinhagen (Dam B) reservoirs	$150,000.00
Llano River Watershed Alliance	Landowner and Community Engagement in Control of Giant Reed (Arundo donax) in the Upper Llano River Watershed, Fall 2021-Summer 2022	$10,024.28
Luminant Mining Company LLC	Use of Lake Area for Fisheries Research (Big Brown Mine B Area)	$20.00
M Glen Coleman	Lease access for anglers and boaters on the South Llano River	$9,000.00
Mission Presbytery DBA John Knox Ranch	Leasing Access by Anglers to the Blanco River	$15,000.00
Nol Dear	Lease access for anglers and boaters on the South Llano River	$10,800.00
Northeast Texas Municipal Water District	Control of water hyacinth, Eichornia crassipes, giant salvinia, Salvinia molesta, and other invasive aquatic or riparian plant species in Lake O' the Pines.	$40,000.00

Nueces River Authority	San Felipe Creek 2023 Treatment Arundo Control and Restoration	$64,326.90
Nueces River Authority	Project Arundo Control & Restoration Pull.Kill. Plant. in the Nueces Watershed, 2023 Treatment	$53,691.00
Patsy L Spencer DBA Shady Grove Cam	Angler and Boating Access to the San Marcos River	$12,000.00
Paul W Dorsett	Leased access for anglers and boaters on the Brazos River	$59,000.00
Randy Leifeste	Assessment of Passive Revegetation of Upper Brazos River Basin Saltcedar Management Sites	$9,000.00
Richard Bayne DBA Brazos Outdoor Center	Angler and Boater Access to the Brazos River	$9,000.00
Sam Houston State University	The Texasinvasive.org Program	$40,004.53
Scott Mayes	Access	$12,000.00
Shine & Associates Inc	Expert Services in connection with litigation	$8,500.00
Skyline Ranch DBA Ed C Daniel Ranch	River Access for Anglers on the Devils River in Val Verde County	$24,000.00
Stephen F Austin State University	Conservation Status and Life History of Imperiled Fish Species East Texas Streams	$53,112.00
Texas A&M Agrilife Research	TPWD Land and Water Plan (LWP) Revision	$314,475.00
Texas A&M Agrilife Research	Thermal tolerance of Popenaias popeii (Texas hornshell) from the Rio Grande	$92,994.00
Texas A&M Agrilife Research	Distribution, abundance, and current status of Llano River Carpsucker (Carpiodes sp. cf. carpio)	$39,209.86
Texas A&M Agrilife Research	Assessing abundance, sex ratio, and space use by suckermouth armored catfish to enhance control efforts	$40,273.06
Texas A&M Agrilife Research	Host fish use, reproduction, and propagation potential of two East Texas threatened mussel species	$2,046.83
Texas A&M Agrilife Research	Examining the conservation status of freshwater mussels in Texas	$1,287.68
Texas A&M Agrilife Research	Examining trematode prevalence at mussel biodiversity hotspots throughout the state	$37,148.00
Texas A&M University-Corpus Christi	Conservation genomic assessment of imperiled freshwater fishes endemic to the Pecos and Devils Rivers	$32,925.00
Texas A&M University-Corpus Christi	Conservation Genomics of Pecos Pupfish (Cyprinodon pecosensis)	$23,461.00
Texas Conservation Science, Inc	Cypress Basin Riparian Productivity and Environmental Flow Management: Trend Analysis and Paired-Watershed Assessment (Continuation of Contract ID: CA-0000730)	$8,156.92

Texas Conservation Science, Inc	Assessment of Passive Revegetation of Upper Brazos River Basin Saltcedar Management Sites	$38,231.88
Texas Conservation Science, Inc	Hydraulic connectivity to riverine habitats in the Colorado and Lavaca basins	$37,705.82
Texas State University - San Marcos	Fish and freshwater mussel community assessments in off-channel habitats of the Sabine River drainage	$80,000.00
Texas State University - San Marcos	Geomorphic and sediment analysis of the upper Brazos River in response to saltcedar control	$27,761.27
Texas State University - San Marcos	Geographic Information System Data Update for Healthy Creeks Initiative 2023	$11,644.00
Texas State University - San Marcos	Zebra mussel monitoring in Texas reservoirs and outreach	$71,069.00
Texas State University - San Marcos	Assessing ammonia toxicty of Texas unionid mussels	$67,282.26
Texas State University - San Marcos	Using remote sensing to map Arundo donax populations in Native Fish Conservation Areas throughout Texas to better understand casual factors of invasion & set management priorities	$49,874.00
Texas Tech University	Assessing Bigheaded carp populations of the Sulphur River below Wright Patman Lake	$113,145.78
Texas Tech University	Food habits of SGCN fishes to inform habitat assessment and restoration in the Red River basin	$37,024.00
Texas Tech University	Assessment of Gila pandora in Little Aguja Creek (Davis Mountains), Texas	$49,961.00
Texas Tech University	Evaluating resilience and vulnerability of fish assemblage structure to intermittent flow	$34,129.35
Texas Tech University	Ecology of Devils River Minnow Dionda diaboli in an invaded stream-riparia ecosystemPass-thru to Texas Tech	$27,873.00
Texas Tech University	Dimensions of diversity in urban fisheries: Examining habitat, fish, and anglers to inform the management of Texas Community Fishing Lakes	$30,221.94
Thomas A Goynes	Angler and Boating Access to the Colorado River	$12,000.00
Town Lake Trail Foundation DBA The Trail	Longhorn Shores / Lady Bird Lake Habitat Improvement	$20,800.00
Town of Little Elm	Little Elm Kayak Launch	$50,000.00
Treefolks Inc	Central Texas Floodplain Reforestation Program	$40,500.00
Trinity River Authority of Texas	Control of giant salvinia Salvinia molesta, water hyacinth Eichhornia crassipes and other aquatic or riparian plant species in Lake Livingston	$30,000.00
University of Houston Clear Lake	Establishing a Network of Eel Ramps to Monitor Recruitment of Glass and Elver American Eel	$35,715.00

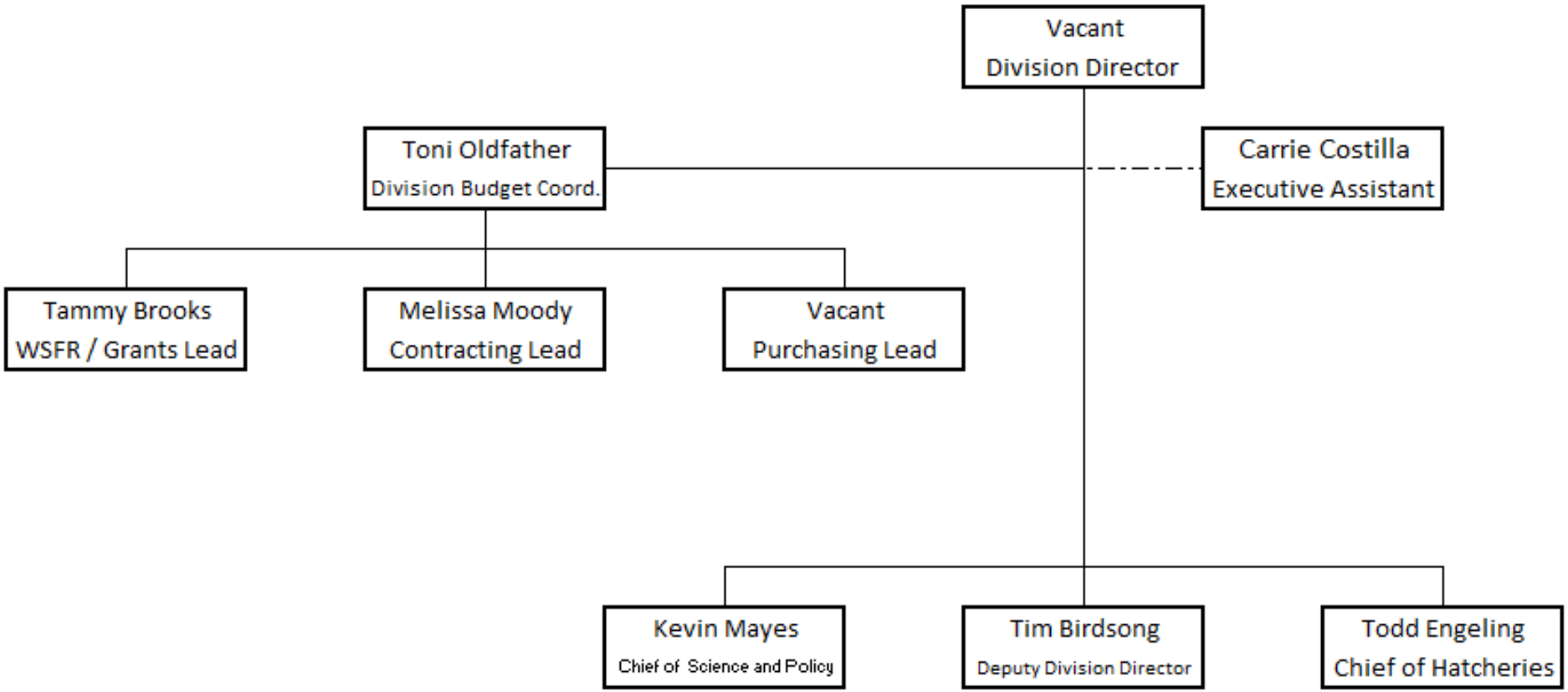
University of Illinois	TX T-261 Risk Assessment and Conservation of Five Narrowly Endemic Crayfish in eastern Texas.	$49,224.00
University of North Texas	Quantification of physiological performance and other functional traits of Plains fishes in support of mechanistic management and conservation	$99,544.00
University of Texas at Austin	Population genomics in imperiled mussels and their hosts in the Guadalupe River	$33,333.00
University of Texas at Austin	Hydrologic Monitoring of Priority Habitats in the Devils River	$31,790.00
University of Texas at Austin	Gap Sampling within the Texas Native Fish Conservation Areas Network	$288,785.02
University of Texas at San Antonio	Developing and validating bioenergetics models for Guadalupe Bass	$67,266.00
University of Texas at San Antonio	Assessing acute and chronic thermal sensitivity and exposure of spring-associated fishes	$88,305.00
University of Texas at Tyler	Surveys of Ephemeroptera, Plecoptera, and Trichoptera Species of Greatest Conservation Need	$47,365.00
University of Texas Rio Grande Valley	Fish Assemblages of the Rio Grande between Eagles Pass and Laredo, Texas	$5,157.00
Walta Pippen Cooke	Leasing Access by Anglers to the Sabine River	$6,000.00
William D O'Hara DBA Bill O'Hara Land Surveyor	Expert Services in connection with litigation	$15,845.00
William Douglass Shaw	Mountain Creek Lake Damage Assessment	$89,300.00

Grants and Donations — Incoming Funds

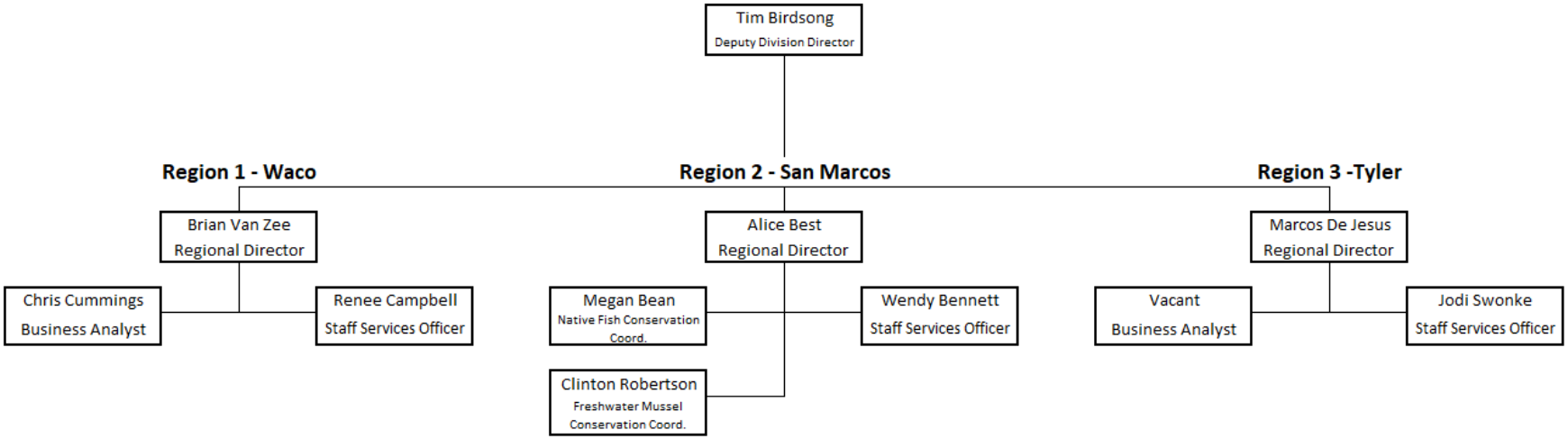
Donor	Amount
Backcountry Hunters and Anglers	$8,000
Guadalupe River Trout Unlimited	$7,000
Guadalupe River Trout Unlimited	$5,000
Sabine River Authority	$30,000
Bass Pro Shops/Cabela's Outdoor Fund	$38,220
Friends of TFFC	$5,600
SePro	$141,320
Texas Parks and Wildlife Foundation	$8,815.78

Organizational Charts

Inland Fisheries Administration

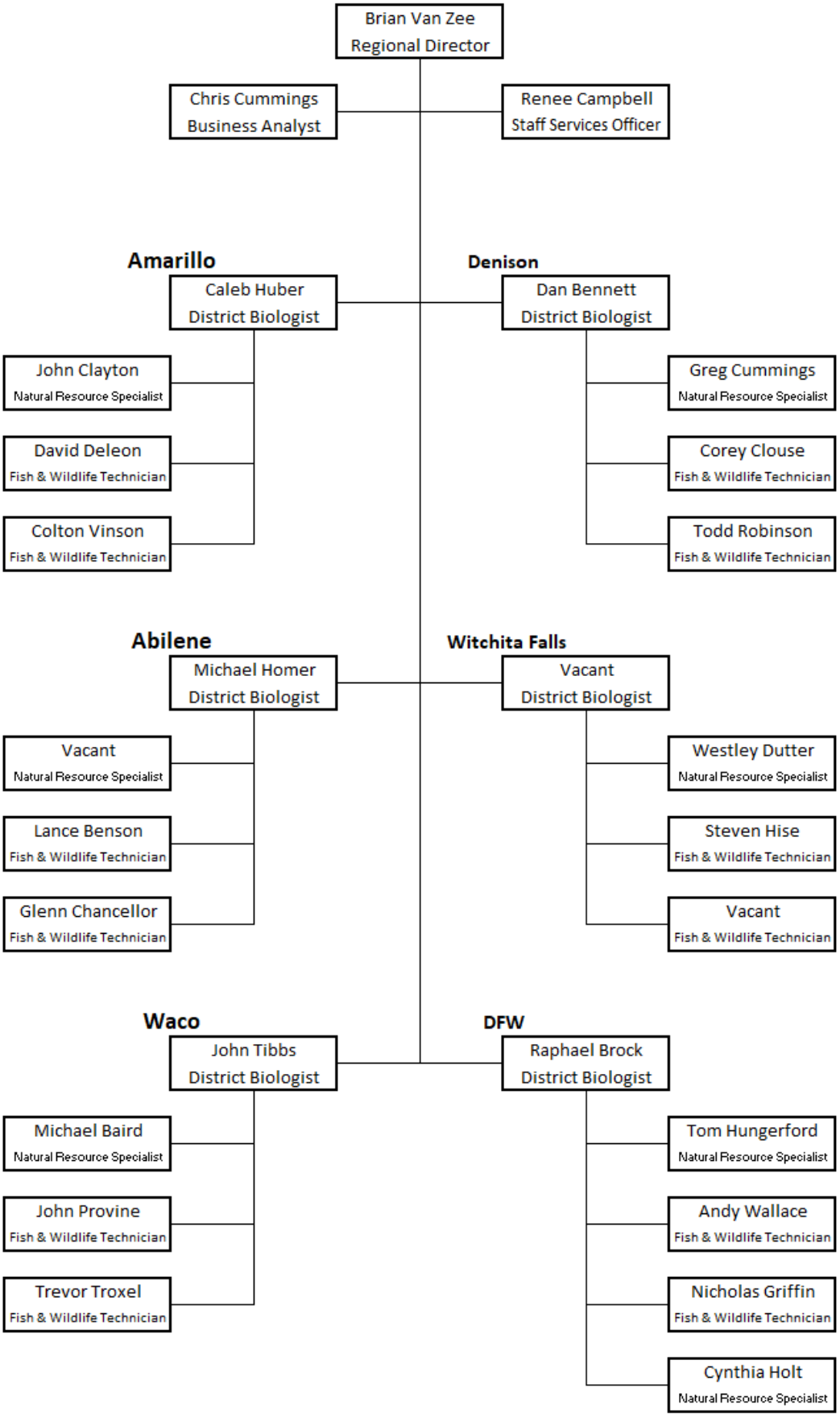


Management and Conservation



Regional staff listed on the following three pages.

Management and Conservation — Region 1



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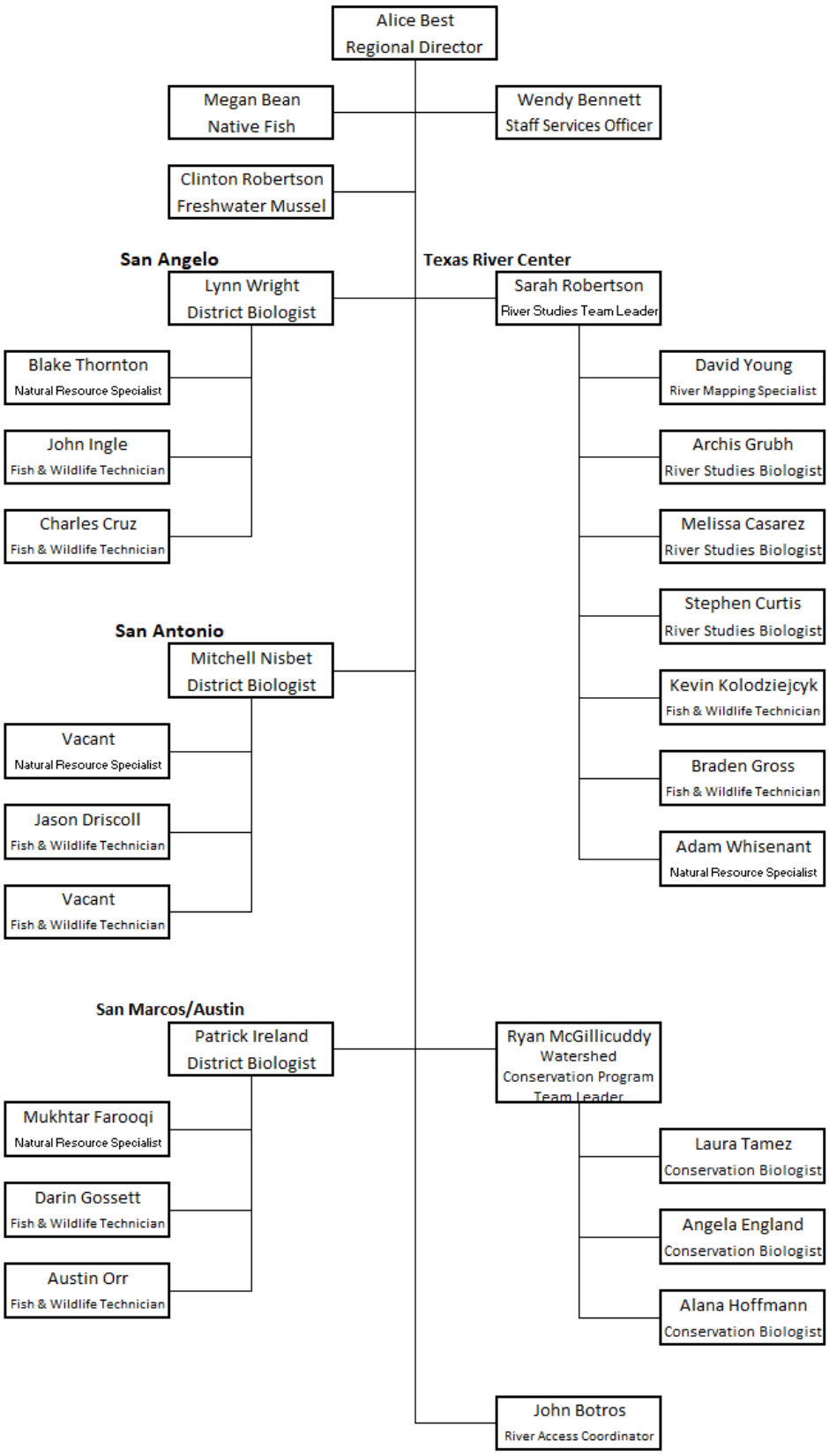
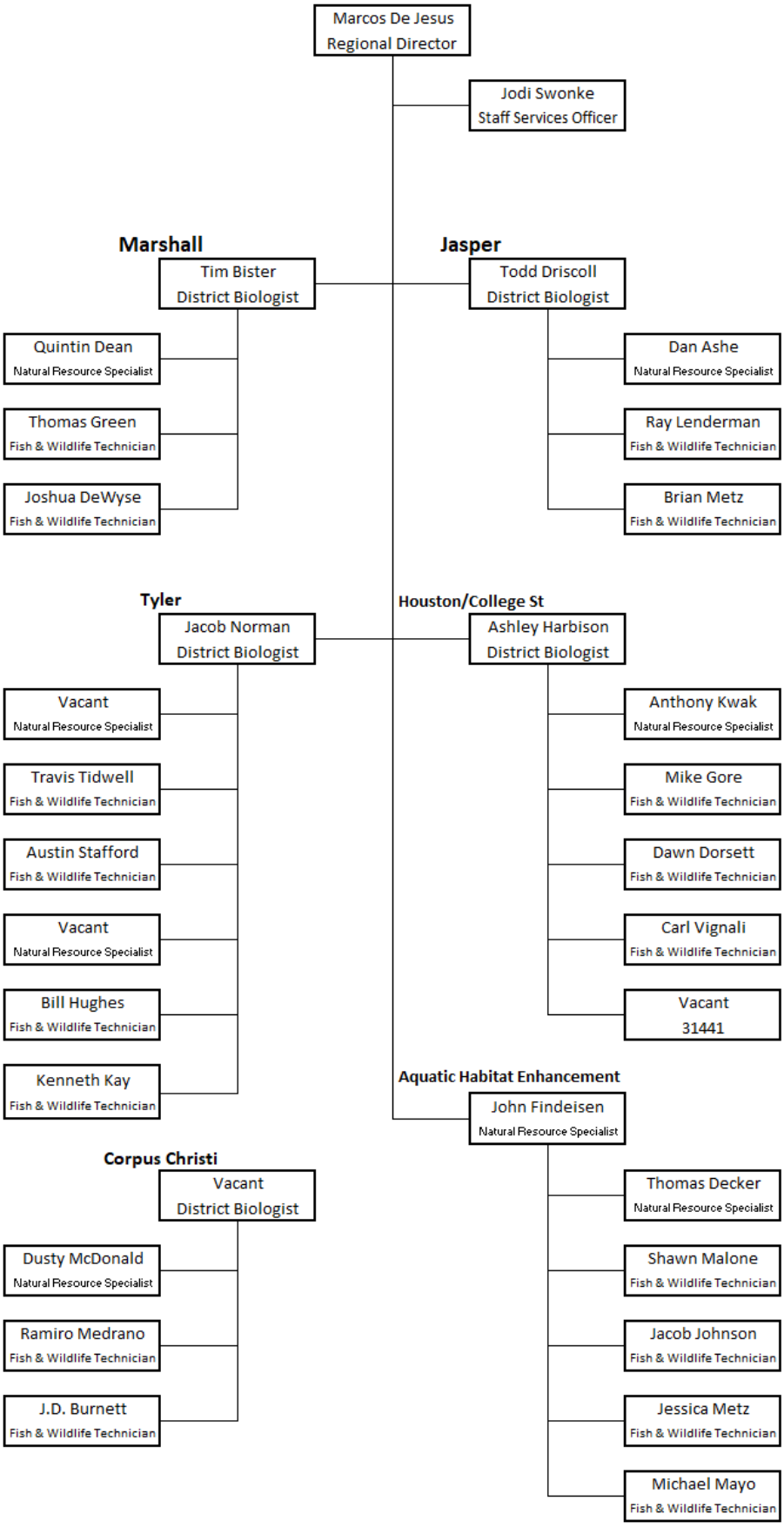
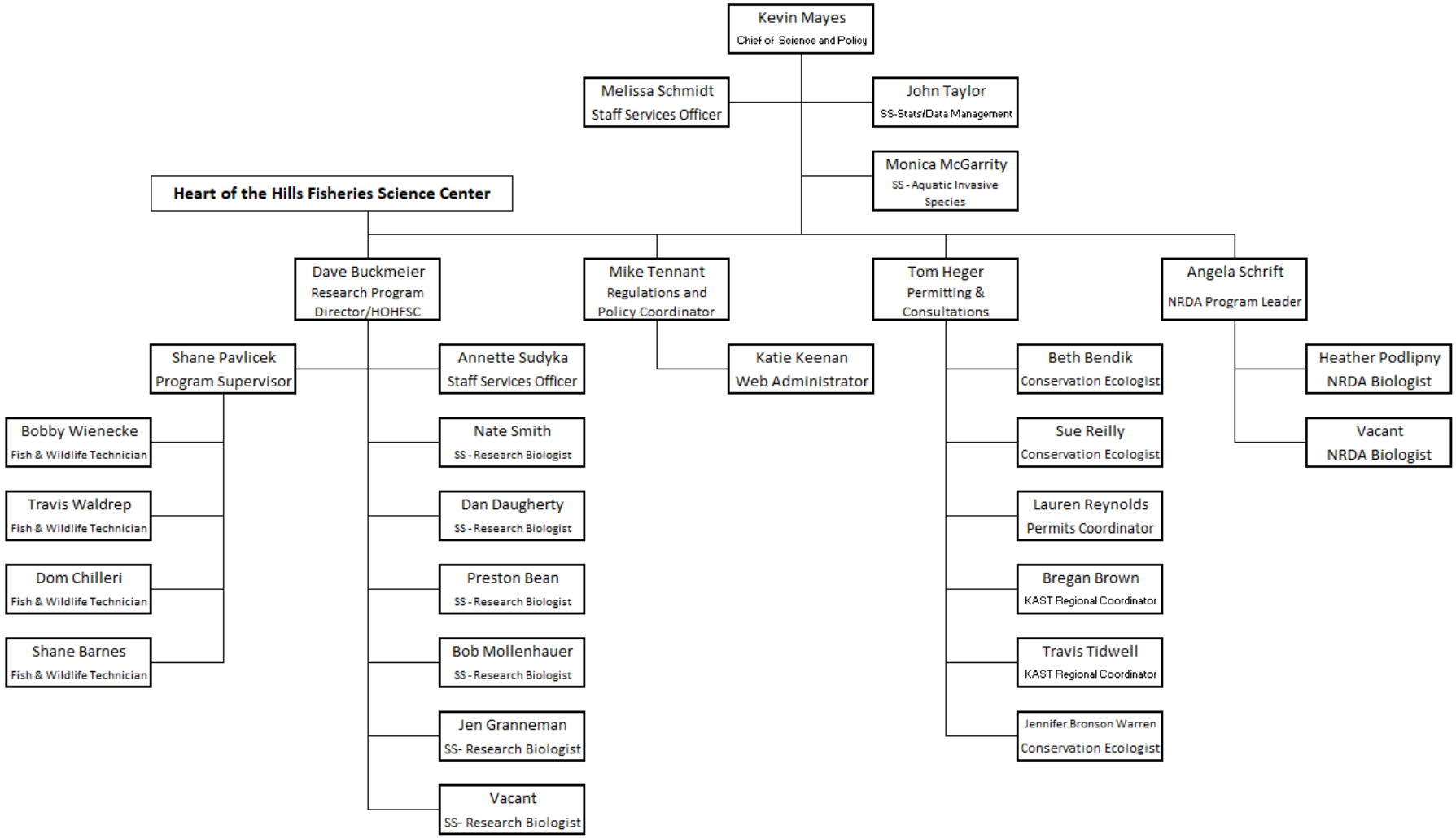


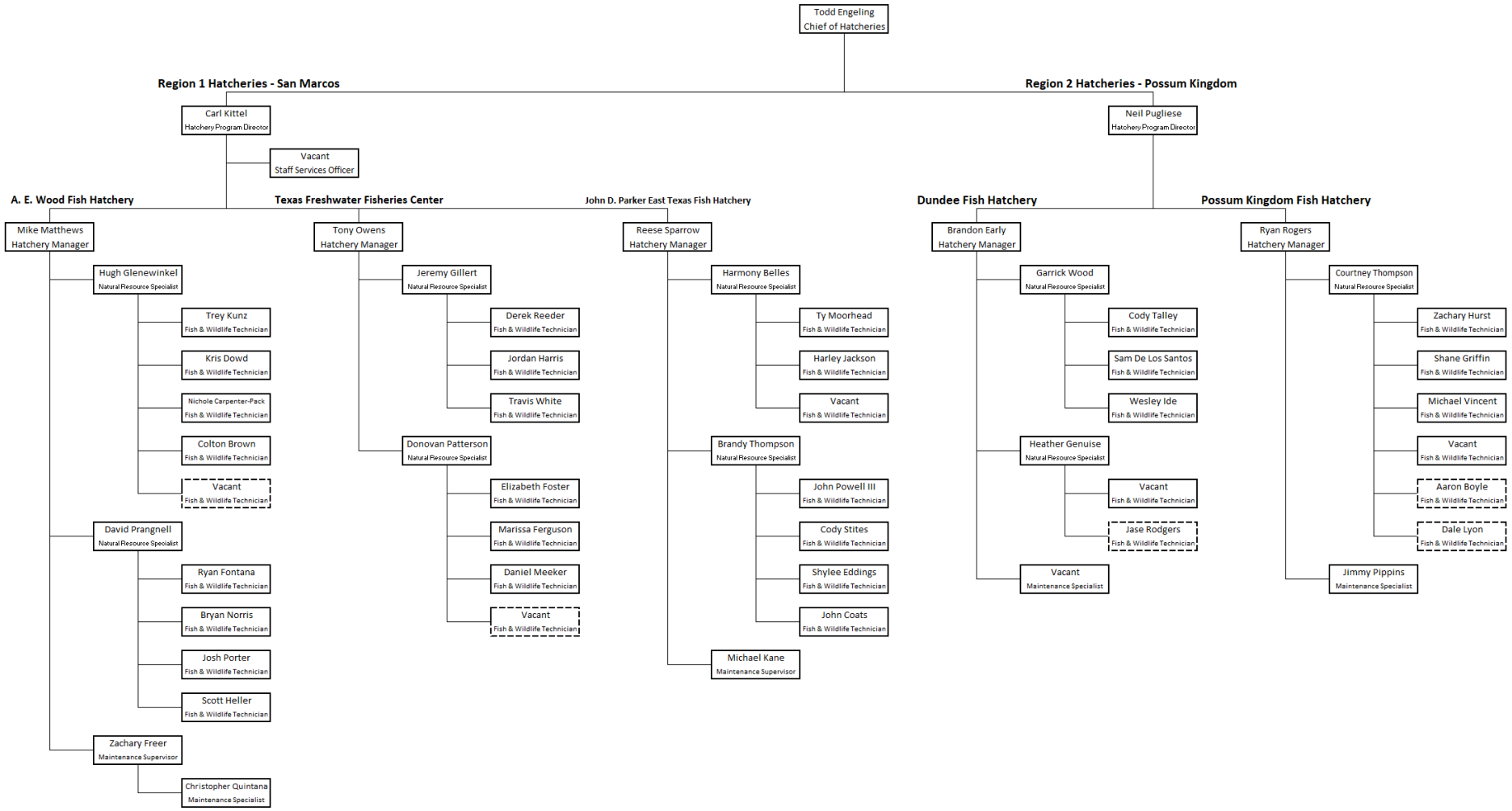
Management and Conservation — Region 3



Fisheries Science and Policy



Hatcheries


Todd Engeling
Chief of Hatcheries
Region 1 Hatcheries - San Marcos
Region 2 Hatcheries - Possum Kingdom
Carl Kittel
Hatchery Program Director
Vacant
Staff Services Officer
Neil Pugliese
Hatchery Program Director
A. E. Wood Fish Hatchery
Texas Freshwater Fisheries Center
John D. Parker East Texas Fish Hatchery
Dundee Fish Hatchery
Possum Kingdom Fish Hatchery
Mike Matthews
Hatchery Manager
Tony Owens
Hatchery Manager
Reese Sparrow
Hatchery Manager
Brandon Early
Hatchery Manager
Ryan Rogers
Hatchery Manager
Hugh Glenewinkel
Natural Resource Specialist
Trey Kunz
Fish & Wildlife Technician
Kris Dowd
Fish & Wildlife Technician
Nichole Carpenter-Pack
Fish & Wildlife Technician
Colton Brown
Fish & Wildlife Technician
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Fish & Wildlife Technician
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Fish & Wildlife Technician
Scott Heller
Fish & Wildlife Technician
Zachary Freer
Maintenance Supervisor
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Maintenance Specialist
Jeremy Gillert
Natural Resource Specialist
Derek Reeder
Fish & Wildlife Technician
Jordan Harris
Fish & Wildlife Technician
Travis White
Fish & Wildlife Technician
Donovan Patterson
Natural Resource Specialist
Elizabeth Foster
Fish & Wildlife Technician
Marissa Ferguson
Fish & Wildlife Technician
Daniel Meeker
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Fish & Wildlife Technician
Harmony Belles
Natural Resource Specialist
Ty Moorhead
Fish & Wildlife Technician
Harley Jackson
Fish & Wildlife Technician
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Fish & Wildlife Technician
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Fish & Wildlife Technician
Shylee Eddings
Fish & Wildlife Technician
John Coats
Fish & Wildlife Technician
Michael Kane
Maintenance Supervisor
Garrick Wood
Natural Resource Specialist
Cody Talley
Fish & Wildlife Technician
Sam De Los Santos
Fish & Wildlife Technician
Wesley Ide
Fish & Wildlife Technician
Heather Genuise
Natural Resource Specialist
Vacant
Fish & Wildlife Technician
Jase Rodgers
Fish & Wildlife Technician
Vacant
Maintenance Specialist
Courtney Thompson
Natural Resource Specialist
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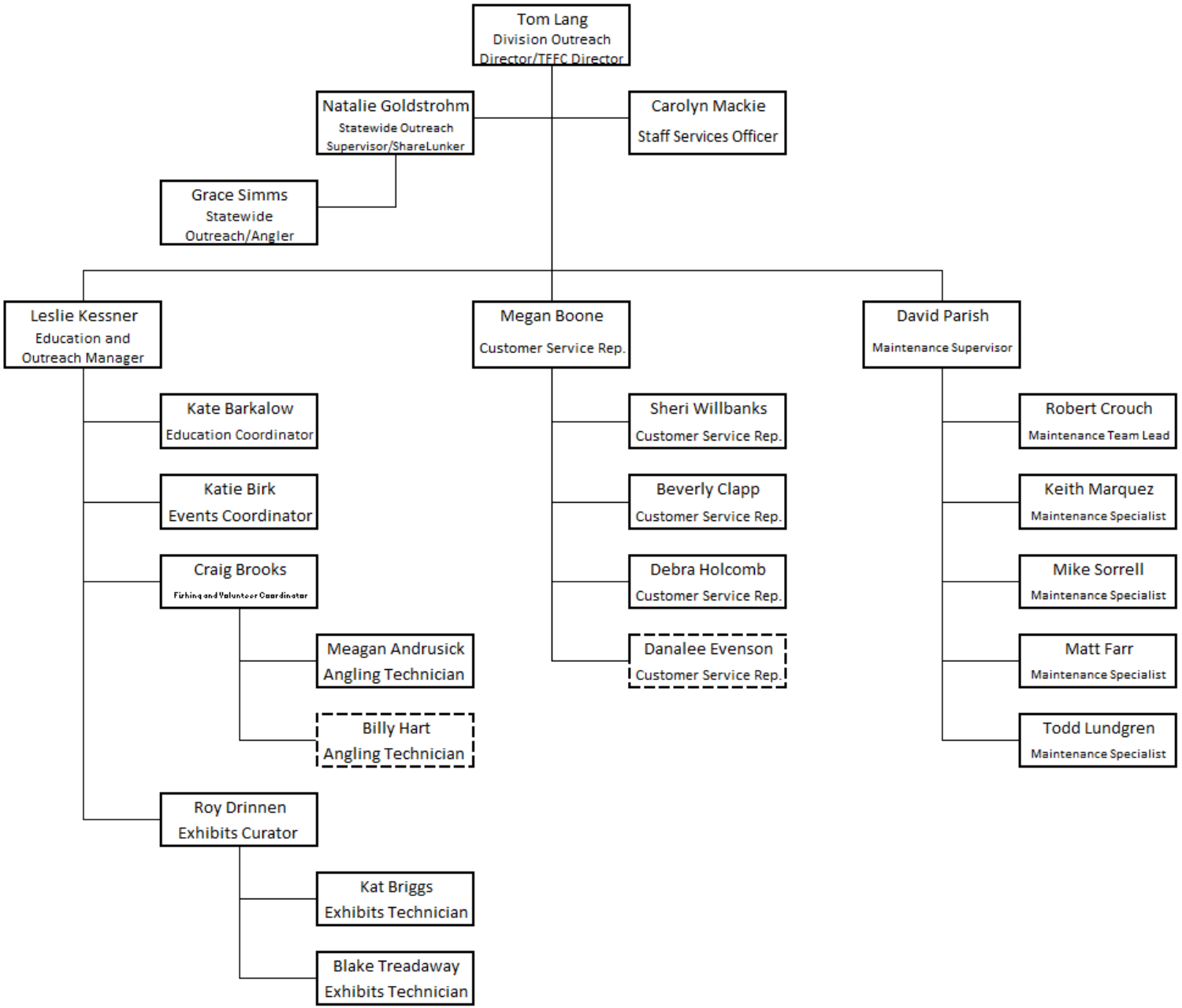
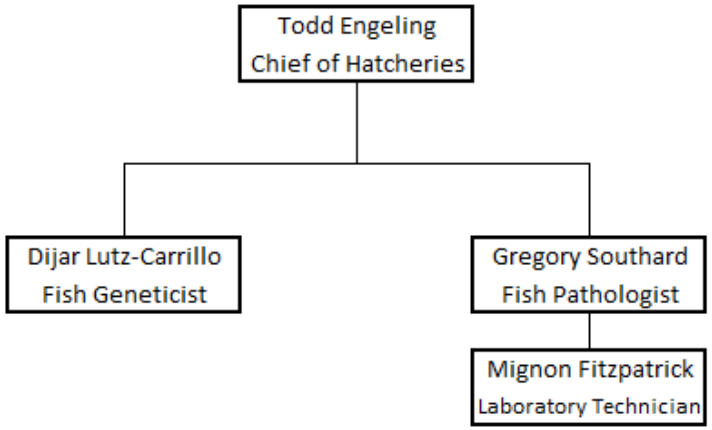
Shane Griffin
Fish & Wildlife Technician
Michael Vincent
Fish & Wildlife Technician
Vacant
Fish & Wildlife Technician
Aaron Boyle
Fish & Wildlife Technician
Dale Lyon
Fish & Wildlife Technician
Jimmy Pippins
Maintenance Specialist

Texas Freshwater Fisheries Center



Analytical Services



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