

Texas River Access and Conservation Areas: A Case Study in Use of Riparian Leases to Enhance Angler Access and Facilitate River Stewardship

Timothy W. Birdsong, *Texas Parks and Wildlife Department, 4200 Smith School Road, Austin, TX 78744*

Stephan Magnelia, *Texas Parks and Wildlife Department, 505 Staples Road, San Marcos, TX 78666*

John Botros, *Texas Parks and Wildlife Department, 505 Staples Road, San Marcos, TX 78666*

Megan Bean, *Texas Parks and Wildlife Department, 5103 Junction Highway, Mountain Home, TX 78058*

Alana Hoffman, *Texas Parks and Wildlife Department, 505 Staples Road, San Marcos, TX 78666*

M. Melissa Parker, *Texas Parks and Wildlife Department, 505 Staples Road, San Marcos, TX 78666*

Sarah Robertson, *Texas Parks and Wildlife Department, 505 Staples Road, San Marcos, TX 78666*

Abstract: Texas contains 307,752 km of streams, creeks and rivers, including 64,686 km of perennially flowing waters. The state maintains public navigability laws that ensure the rights of paddlers and anglers to wade and float many Texas creeks and rivers. However, private ownership of riverbanks limits the number of locations where the public can legally access those waters from land. To confront this reality, Texas Parks and Wildlife Department (TPWD) and cooperating organizations built partnerships with private riparian landowners to expand fishing and paddling opportunities on publicly navigable creeks and rivers. This was accomplished by securing and leveraging innovative funding sources to establish river access leases with private riparian landowners. Additionally, TPWD and cooperators assembled and implemented conservation plans to ensure sustainable recreational use of the new river access areas and built collaborative relationships among local fly-fishing clubs, non-governmental organizations, and communities to promote and encourage use of river access areas and to engage local partners in delivery of volunteer-based river stewardship projects. In 2012–2019, 24 public river access leases were established with cooperating landowners. The corresponding access areas enabled or enhanced paddling and river fishing on more than 340 km of 10 different rivers across Texas. These approaches offer a case study transferable to other states with riparian land ownership and river navigability laws comparable to Texas.

Key words: angler access, river fisheries management, sustainable recreation

Journal of the Southeastern Association of Fish and Wildlife Agencies 7: 114–122

In 2016, about 45% of the freshwater angling community in the United States went fishing on rivers and accounted for 127 million fishing days (USFWS and USCB 2018). Texas rivers offer a wide variety of fishing opportunities for warm- and cold-water species. Expenditures by river anglers and other river recreationists contribute significantly to the economies of communities throughout the state, particularly in rural areas. River fishing within a 24-county region of central Texas, referred to as the Texas Hill Country (Figure 1), generated an economic value of US \$71.6 million over a 16-month period from August 2011 to December 2012 (Thomas et al. 2015). Seasonal fishing for white bass on the Colorado River upstream of Lake Buchanan generated an economic value of more than \$2.8 million over a three-month period from March to May 2011 (S. Magnelia, TPWD, unpublished data). The economic value of fishing, paddling, rafting and other forms of recreation on the Guadalupe River in Comal County, Texas, was estimated at \$84.2 million annually (Impact DataSource 2012).

In Texas and nationally, fishing and other recreational uses of rivers has continued to increase, propelled in part by the rapid growth in popularity of kayaks, canoes, rafts, standup paddleboards, and other non-motorized watercraft (The Outdoor Industry Association 2009, The Outdoor Foundation 2013, 2014, and 2015, Thomas and Arsuffi 2015). In 2014, 21.7 million Americans (7.4% of the population) participated in paddling, an increase of more than 3 million participants since 2010 (The Outdoor Foundation 2015). Thirty-five percent of paddlers surveyed identified freshwater angling as a preferred crossover activity. In a survey of river anglers in the Texas Hill Country, 53% identified kayaks, canoes, or float tubes as methods they often or always use to go fishing in rivers, which closely followed wade fishing (59%) as the primary method (Thomas et al. 2015).

Texas contains 307,752 km of rivers and streams, including 64,686 km of perennially flowing waters (USEPA 2002). The State of Texas maintains stream navigability laws that ensure the rights

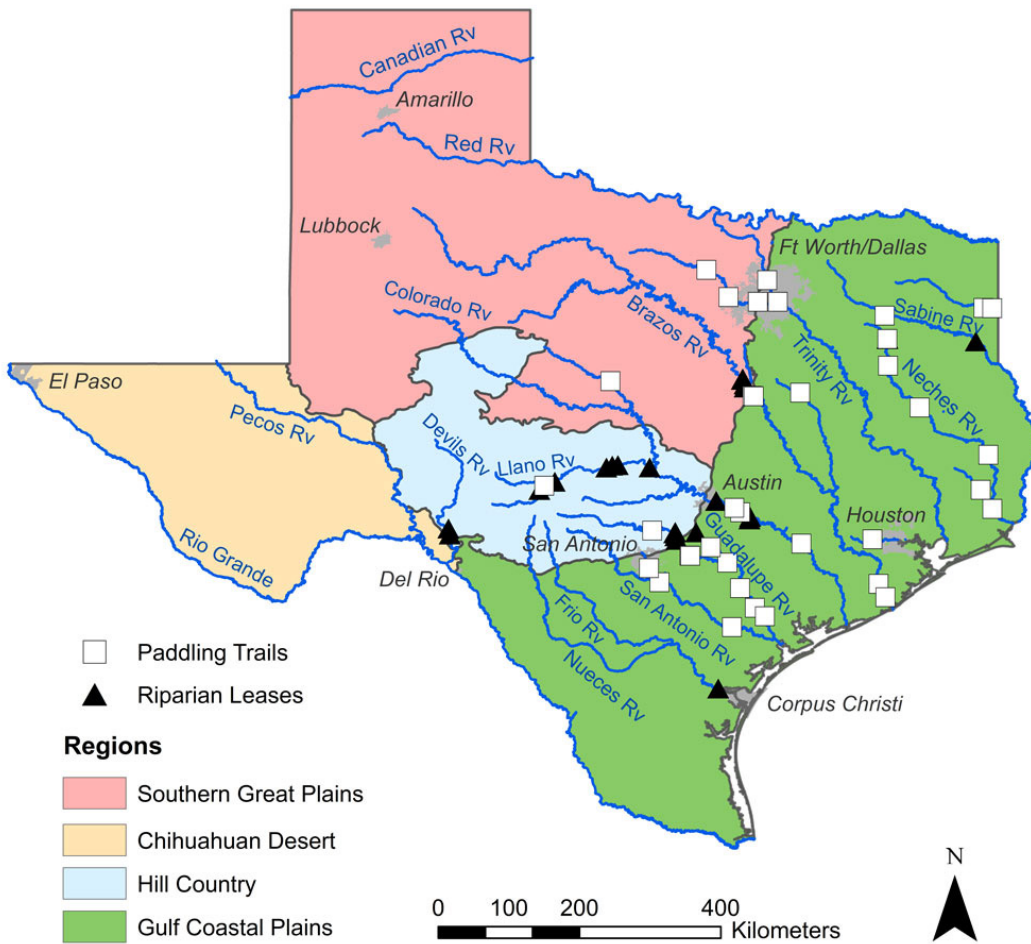


Figure 1. Locations of private riparian leases that offer public river access through the River Access and Conservation Areas Program and river access areas that serve as paddle craft launches for Texas Paddling Trails.

of anglers, paddlers, and other river recreationists to wade or float many Texas rivers (Kennedy 2002, Sweeney 2016). State ownership and jurisdiction over the beds of Texas rivers and streams varies depending on the nature of patents or grants of land by the historic and current governments of Spain and Mexico, the Republic of Texas, and the State of Texas. Generally, these include all major rivers and their tributaries upstream to a point where mean stream width is less than 9.14 m (Sweeney 2016). The public has the right to access reaches of Texas rivers and streams where the beds are state-owned regardless of whether flows are sufficient to float, such as those with braided channels, expansive shoals, or karst landscapes where streams periodically flow subsurface (Kennedy 2002).

Although Texas stream navigation laws enable plentiful paddling and river fishing opportunities throughout the state (Figure 1 and Table 1), private ownership of river banks limits the number of land-based locations where anglers and paddlers can legally ac-

cess Texas rivers (Kennedy 2002, Sweeney 2016). The prevalence of privately-owned riverbanks reflects general land ownership trends in Texas, a state where less than 5% of the landscape is in public ownership (Anderson et al. 2014). As awareness has increased of the diverse river fishing opportunities available in Texas, so has interest among paddlers and river anglers for improved access. Thomas and Arsuffi (2015) found that lack of quality river access was second only to inadequate river flows on the list of concerns of Texas Paddling Trail users. Furthermore, paddlers identified access as the top convenience considered when choosing the location for a trip. Similarly, 74% of river anglers in the Texas Hill Country identified increased river access as an important fisheries management action needed in the region, which only followed habitat and water quality improvements (94%) in level of importance to river anglers (Thomas et al. 2015).

Table 1. Examples of sport fishing opportunities on Texas rivers (Texas Parks and Wildlife Department [TPWD] 1974).

Region	River	Sport fishing opportunities
Intersection of Chihuahuan Desert and Hill Country	Pecos River from its confluence with Independence Creek to its confluence with the Rio Grande	Remote, wilderness fishing in a limestone canyon system by canoe or kayak for largemouth bass (<i>Micropterus salmoides</i>)
Intersection of Chihuahuan Desert and Hill Country	Devils River from Baker's Crossing to its confluence with the Rio Grande at Amistad Reservoir (Figure 2)	Remote, wilderness fishing by canoe or kayak for largemouth bass and smallmouth bass (<i>Micropterus dolomieu</i>)
Hill Country	Rocky, spring-fed rivers including Brushy and Onion creeks and the Blanco, Frio, Guadalupe, Lampasas, Llano, Medina, Nueces, Pedernales, and San Gabriel rivers	Float fishing by raft, drift boat, canoe, kayak, tube, or paddleboard for Guadalupe bass (<i>Micropterus treculii</i>), largemouth bass, Rio Grande cichlid (<i>Herichthys cyanoguttatus</i>), and various Centrarchids (<i>Lepomis</i> spp.)
Southern Great Plains	Brazos River downstream of Possum Kingdom Reservoir to the City of Waco	Float fishing by canoe or kayak for smallmouth bass, largemouth bass, and striped bass (<i>Morone saxatilis</i>)
Southern Great Plains	Wichita River from the City of Wichita Falls to its confluence with the Red River	Float fishing by canoe or kayak for channel catfish (<i>Ictalurus punctatus</i>), blue catfish (<i>Ictalurus furcatus</i>), and flathead catfish (<i>Pylodictis olivaris</i>)
Intersection of Southern Great Plains and Gulf Coastal Plains	Elm Fork of the Trinity River downstream of Lewisville Reservoir	Float fishing by canoe, kayak, or motorboat for white bass (<i>Morone chrysops</i>), palmetto bass (striped bass x white bass hybrid), largemouth bass, spotted bass (<i>Micropterus punctulatus</i>), channel catfish, blue catfish, and flathead catfish
Gulf Coastal Plains	Red River downstream of Texoma Reservoir	Bank fishing for striped bass and white bass
Gulf Coastal Plains	Trinity River downstream of Livingston Reservoir	Float fishing by canoe, kayak, or motorboat for alligator gar (<i>Atractosteus spatula</i>), blue catfish, and striped bass
Gulf Coastal Plains	Lower Colorado River downstream of the City of Austin	Float fishing by canoe, kayak, or motorboat for largemouth bass and Guadalupe bass
Gulf Coastal Plains	Big Cypress Bayou downstream of Lake O' the Pines Reservoir to Caddo Lake	Float fishing by canoe, kayak, or motorboat for largemouth bass, spotted bass, palmetto bass, channel catfish, and various Centrarchids (<i>Lepomis</i> spp.)
Gulf Coastal Plains	Village Creek upstream of the City of Beaumont	Float fishing by canoe, kayak, or motorboat for largemouth bass, spotted bass, channel catfish, and various Centrarchids (<i>Lepomis</i> spp.)
Gulf Coastal Plains	Sabine River from upstream of Toledo Bend Reservoir downstream to Sabine Lake	Float fishing by canoe, kayak, or motorboat for largemouth bass
Gulf Coastal Plains	Bayous within the Houston metropolitan area including Armand, Brays, and Buffalo bayous	Bank fishing or float fishing by canoe, kayak, or motorboat for largemouth bass, blue catfish, channel catfish, flathead catfish, alligator gar, longnose gar (<i>Lepisosteus osseus</i>), spotted gar (<i>Lepisosteus oculatus</i>), various Centrarchids (<i>Lepomis</i> spp.), and various estuarine fishes
Gulf Coastal Plains	Lavaca River upstream of Lavaca Bay	Float fishing by canoe or kayak for blue catfish, alligator gar, and various estuarine fishes
Edwards Plateau, Southern Great Plains, and Gulf Coastal Plains	Neches River upstream of Palestine and Toledo Bend reservoirs, Trinity River upstream of Livingston Reservoir, and the Colorado River upstream of Buchanan and Lyndon B. Johnson reservoirs	Seasonal bank, wade, and float fishing for white bass during annual spring spawning migrations
Intersection of Hill Country and Gulf Coastal Plains	Guadalupe River downstream of Canyon Reservoir	Bank, wade, and float fishing for rainbow trout (<i>Oncorhynchus mykiss</i>) and brown trout (<i>Salmo trutta</i>)
Statewide	Rivers statewide	Bank, wade, and float fishing for put-and-take winter stockings of rainbow trout in rivers statewide including reaches of the Blanco, Brazos, Frio, Guadalupe, Llano, Pedernales, San Marcos, and Trinity rivers
Statewide	Rivers statewide	Bank and float fishing for channel catfish, blue catfish, and flathead catfish

Increasing Awareness Of Existing Public River Access Areas

To enhance awareness of public river access opportunities and encourage fishing, paddling, wildlife-viewing, and other forms of nature-oriented recreation on Texas rivers, TPWD established the Texas Paddling Trails Program. The program currently consists of 54 trails that encompass 93 river access areas (Figure 1), enabling paddling and fishing on 623 km of Texas rivers. This designation promotes public river access areas at publicly owned land (e.g., city, county, and state parks and public boat ramps) that offer safe and reliable access and family-friendly paddling opportunities (S. Plante, TPWD, personal communication). Partnership agree-

ments are established between TPWD and local communities to build and maintain designated parking at access areas, install program signage on area roadways and at launch and take-out areas on the river, and install informational kiosks that offer a river map and information on river use ethics and etiquette, safety, and natural and historical attractions. Interest and awareness by local communities in the Texas Paddling Trails Program continues to grow, as evidenced by the number of applications for new trails. Five new Texas Paddling Trails are expected to open by spring 2020, providing public river access to an additional 113 km of Texas rivers (S. Plante, TPWD, personal communication). However, many reach-

es of Texas rivers still have limited or no publicly owned riparian lands, particularly in rural areas, precluding participation by local communities in the Texas Paddling Trails Program. Thus, public access to Texas rivers has continued to be limited by the prevalence of privately-owned riparian lands.

Expanding Public River Access With Public-Private Partnerships

To address limitations on public river access and recreation, TPWD formally launched the Texas River Access and Conservation Areas Program (RACA) in 2012 with explicit goals of building public-private partnerships and utilizing private lands leases as a tool to increase river access for the general public. Access areas supported through RACA were also intended to serve as local catalysts for river stewardship by providing venues to host volunteer service projects and community events (e.g., citizen-science activities; riparian stewardship workshops; fly fishing courses and casting clinics), and to demonstrate best management practices in sustainable recreation and conservation of riparian and instream habitats. Conceptually, RACA built upon the successful leased public access model established through the TPWD Public Hunting Program, a comparable program that continues to lease private lands to provide seasonal hunting opportunities for the public. Many rural Texas landowners were aware of hunting lease arrangements offered through TPWD, so there was an expectation that private riparian landowners would recognize and embrace the shared benefits of establishing public river access leases.

The general approach taken to implement RACA consisted of 1) identify priority river reaches statewide that had the potential to offer quality fishing and paddling opportunities, 2) inventory existing public river access areas along priority river reaches, 3) establish partnerships with local communities, fishing clubs, or non-governmental organizations interested in cooperating on the development of new river access areas, 4) identify private riparian properties strategically positioned upstream, downstream, or between existing public river access areas, 5) establish public river access leases with willing private riparian landowners, 6) survey fish communities and characterize instream and riparian habitats within river reaches accessible from the new river access areas, 7) assemble resource conservation plans, 8) perform infrastructure and habitat improvements, and 9) monitor fishery resources and angler use.

To identify riparian landowners willing to cooperate on public river access leases, solicitations were broadly disseminated by TPWD through landowner-focused newsletters, media releases, and popular articles. These described the scope and intent of RACA and provided contact information for interested landowners to arrange a site visit with TPWD. Riparian landowners along priority

river reaches were also contacted directly, with land ownership determined through review of county tax records. Priority was given to properties along reaches of river that 1) offered a unique wilderness setting with intact instream and riparian habitats, 2) offered access to high-quality paddling and river fishing experiences, 3) had limited existing public river access, 4) were strategically positioned to serve as a launch or takeout for floats that used existing upstream or downstream river access areas (e.g., access areas already contained within the Texas Paddling Trails Program), and 5) had the potential to result in long-term river access agreements of five years or more. Of particular interest were reaches of river where cooperative relationships were already established between landowners and local community organizations (e.g., fishing clubs, paddling clubs, and watershed alliances). A programmatic review was completed by TPWD for each proposed access area to select access areas for inclusion in RACA. The review considered a variety of criteria related to recreational value, cost:benefit, local partnerships, leveraged resources, and operational logistics.

During the 2012–2019 timeframe, 24 public river access leases were established with cooperating landowners that supported paddling and river fishing on more than 340 km of 10 different rivers (Figure 1). In coordination with cooperating landowners, special conditions on public use were assembled for each of the river access areas (e.g., daily schedule, reservation requirements, limits on number of users or vehicles). Lease timeframes and payment rates were determined based on evaluations conducted by TPWD that considered the scoring criteria outlined in Table 2 and through negotiations with cooperating landowners. Generally, the lease payment rates were structured to provide \$1000 per month for access areas that scored >90 points, \$750 per month for those that scored 80–90 points, and \$500 per month for those that scored <80 points. Timeframes of individual leases were typically limited by available funding, with most leases established for two to five years and extended based on angler use and availability of additional funding. During 2012–2019, lease payments were primarily funded through competitive grants awarded to TPWD by the U.S. Department of Agriculture Voluntary Public Access and Habitat Incentive Program and the U.S. Fish and Wildlife Service Sport Fish Restoration Recreational Boating Access Grant Program. Additional funds were generated from sales of a Texas rivers-themed vehicle license plate which was established in 2017 to provide a sustainable source of funding for delivery of RACA. Revenues from license plate sales provided a modest level of support for RACA (about \$25,000 annually), but most importantly, those funds served as critically important non-federal matching funds for federal grants.

Descriptions of the river access leases were maintained on the

Table 2. Scoring criteria used to evaluate the quality of proposed river access areas being considered through the Texas River Access and Conservation Areas Program.

Scoring criteria	Points awarded
River reach offers high quality paddling and river fishing experiences	0–10 points
River reach offers a wilderness setting with intact instream and riparian habitats	0–10 points
River reach would otherwise have limited public river access	0–10 points
River access area is strategically positioned to connect with other upstream or downstream river access areas	0–10 points
River reach is located near an urban population center	0–10 points
Presence and willingness of local partner organizations to help support maintenance of the access area, such as local fishing or paddling clubs, community organizations, school groups, or conservation non-profits	0–10 points
Quality of layout, infrastructure, and amenities including gates, parking areas, trails, and ease of access	0–10 points
Local services accessible to visitors, such as kayak shuttle and livery services or fishing guide services	0–10 points
Length of river accessible for paddling and fishing (<8 km = 5 points; 8–16 km = 10 points; >16 km = 20 points)	5–20 points

TPWD River Fishing web page (www.tpwd.texas.gov/riverfishing). This included contact information for the access areas, locations and directions, lease timeframe, river maps, descriptions of access area amenities, and descriptions of special conditions on public use unique to each access area. Informational kiosks and brochure dispensers were installed at a subset of the access areas to communicate special conditions on public use. The access areas were also promoted through TPWD media releases, radio interviews, articles in fly fishing magazines and newsletters, social media posts, and through presentations and exhibits at fly fishing meetings, festivals, and expos.

Each of the 24 river access areas established during 2012–2019 offered a unique set of circumstances and operational logistics (e.g., absentee versus onsite landowner, open versus gated access, restrooms or other onsite amenities versus primitive, seasonal versus multi-year lease agreements), providing a diverse set of access areas to coordinate through what was effectively the formative phase of RACA. This proof-of-concept demonstrated the substantial level of interest in RACA from landowners and helped TPWD and partners further develop and refine strategies and approaches for addressing the litany of issues (e.g., landowner liability) and conflicts (such as among users or between users and riparian landowners) that can emerge upon increasing public access and use within a reach of river.

Collaboration With The Texas Fly Fishing Community

At the 2014 Texas Fly Fishing Expo, organized by the then newly formed Texas Council of Fly Fishers International (FFI), TPWD presented a session that profiled aquatic and angler education,

fisheries management, river conservation, and angler access programs. The mission of the Texas Council of FFI and their network of 21 fly fishing clubs located throughout Texas is to ensure the legacy of fly fishing for all fish in all waters continues by focusing on conservation, education, and a sense of community. Interactions between TPWD and the Texas Council of FFI at the Texas Fly Fishing Expo generated increased awareness of the shared mission and interests of the organizations and led to a series of subsequent meetings to explore opportunities for collaboration on angler access, fish conservation, and habitat restoration projects. Opportunities for collaboration identified at those meetings included 1) profiling RACA at fly fishing festivals and monthly club meetings to increase awareness and use of the access areas by fly anglers, 2) scheduling of events at the access areas (e.g., fly tying or casting workshops), 3) delivery of volunteer service projects by member fly fishing clubs at the access areas, and 4) participation from member fly fishing clubs in identification of additional riparian properties located along reaches of river considered priorities for enhancing angler access.

In fall 2014, FFI signed a Memorandum of Understanding (MOU) with the Southeast Aquatic Resources Partnership (SARP), a program of the Southeastern Association of Fish and Wildlife Agencies and a recognized partnership of the National Fish Habitat Partnership. The mission of SARP is to collaborate with partners to conserve and restore aquatic resources throughout the region for the continuing benefit, use, and enjoyment of the American people (SARP 2014). Efforts to implement that mission are guided by the National Fish Habitat Action Plan (Plan; AFWA 2012). Signing of the MOU between FFI and SARP formalized support for FFI councils and clubs to cooperate with SARP member agencies and organizations, including TPWD, on implementation of the Plan. Directly pertinent to RACA, a primary objective of the Plan is to “broaden the community of support for fish habitat conservation by increasing fishing opportunities, fostering the participation of local communities in conservation activities, and raising public awareness of the role healthy fish habitats play in the quality of life and economic well-being of local communities.” The MOU further incentivized cooperation between the Texas Council of FFI and TPWD in delivery of RACA, and soon thereafter, the Texas Council of FFI initiated what was effectively an “adopt an access area” program in which the Texas Council of FFI made concerted efforts to foster relationships with RACA cooperating landowners and organize fly fishing club outings and stewardship projects at the river access areas. As the partnership expanded, the Texas Council of FFI and their network of fly-fishing clubs cooperated with TPWD to identify and prioritize approximately 20 additional reaches of Texas rivers where access improvements were needed to enhance

fishing and paddling opportunities. This was conducted through a request for recommendations disseminated by TPWD to the Texas Council of FFI and their member fly fishing clubs. Information requested by TPWD for each of the recommended river reaches consisted of the following:

- General description of the reach of river, including upstream and downstream boundary features (e.g., bridge crossings, dams, stream confluences)
- Fly fishing club that would be interested in cooperating on the development and maintenance of the proposed river access area
- Discussion of any upstream or downstream connection that the proposed river access area would have with existing or proposed TPWD Paddling Trails, other public river access areas, or adjacent publicly owned lands such as wildlife management areas or state or local parks
- Bank and river conditions (e.g., ease of access, seasonal flows) at the proposed river access area, and in the upstream or downstream reaches of river that the area provides access
- Types of fishing experiences offered in the reach of river (e.g., bank fishing, wade fishing, kayak fishing)
- Fish species that would likely be targeted by anglers in the reach of river and general impressions on the quality of those fisheries
- Description of any local services currently available in the area such as kayak rental and shuttle services or fishing guide services
- Potential concerns from adjacent private landowners or potential conflicts with other recreational users
- Potential public safety issues

The partnership established between TPWD and the Texas Council of FFI substantially enhanced efforts to identify, plan, establish, and maintain public river access areas supported through RACA. In recognition of these collaborative efforts and the resulting expanded river angling opportunities in the State, FFI presented TPWD with the 2016 James A. Henshall Warmwater Fisheries Award.

Sustainable Management Of River Access Areas

A standardized survey methodology was developed to assess fish communities, characterize instream and riparian habitats, and monitor angler use at access areas supported through RACA (Birdsong et al. 2019). Survey results were used to examine popularity of individual access areas among anglers and inform decisions as to whether individual leases would be extended or rates renegotiated. For example, Magnelia and De Jesus (2018) estimated an economic value of more than \$380,000 from December 2014 to April 2015 from three seasonal leases on the Guadalupe River, which were established to provide public access to the winter

trout fishery downstream of Canyon Reservoir. During that time-frame, a total of 4651 anglers utilized the three access areas and accounted for 17,752 angler hours. With consideration of TPWD costs associated with trout stocking and lease payments, economic benefit-to-expenditure ratios were calculated for each of the access areas and ranged from 10:1 to 19:1 per access area. At the Devils River, a 15% increase occurred in the total number of permitted paddlers using the river following establishment of riparian leases ($n=1398$ in 2016, $n=1648$ in 2017; Robertson 2018). During the first year of use, 37% of the permitted paddlers used the new access areas (Robertson et al. 2019).

In contrast, some river access areas supported through RACA received substantially lower usage. Despite offering quality fishing access near the major population center of Austin and providing an excellent sport fishery for multiple species, only 104 anglers used one of the river access areas on the lower Colorado River from January to August 2017 (Magnelia 2018). Creel surveys indicated that overall fishing pressure on the lower Colorado River was generally low (Cummings and De Jesus 2017). While definitive reasons for low utilization of this fishery are unknown, increasing the number of secure parking areas was identified as one of the most important actions that could be taken by TPWD to increase utilization of Texas rivers (Thomas et al. 2015). As angler awareness of the secure parking areas offered through RACA increases, it is anticipated that utilization of the fishery on the lower Colorado River will also increase (Magnelia 2018).

Survey results were also used to inform development of site-specific resource conservation plans assembled for each of the access areas (e.g., East and Botros 2018). Resource conservation plans were assembled to guide infrastructure improvements (e.g., improvements to parking areas, trails, or launch areas), habitat restoration, and other stewardship projects to support sustainable recreational use. Stewardship projects included planting of native trees and reseeded of erosional banks, installation of educational kiosks and monofilament fishing line recycling bins, improvements to parking areas and access trails, and creation of paddler manuals and other educational resources for river users. These were planned and conducted in partnership with cooperating riparian landowners, the Texas Council of FFI, and a wide variety of local non-governmental organizations. From 2015–2018, 37 stewardship projects supported by nearly 400 volunteers were conducted at the river access areas.

A primary concern voiced by riparian landowners upon learning of the intent of RACA was that the influx of river users would result in increased litter (Robertson 2018). Thus, TPWD entered into an agreement with Keep Texas Beautiful to conduct trash cleanups along reaches of river accessible from the riparian lands

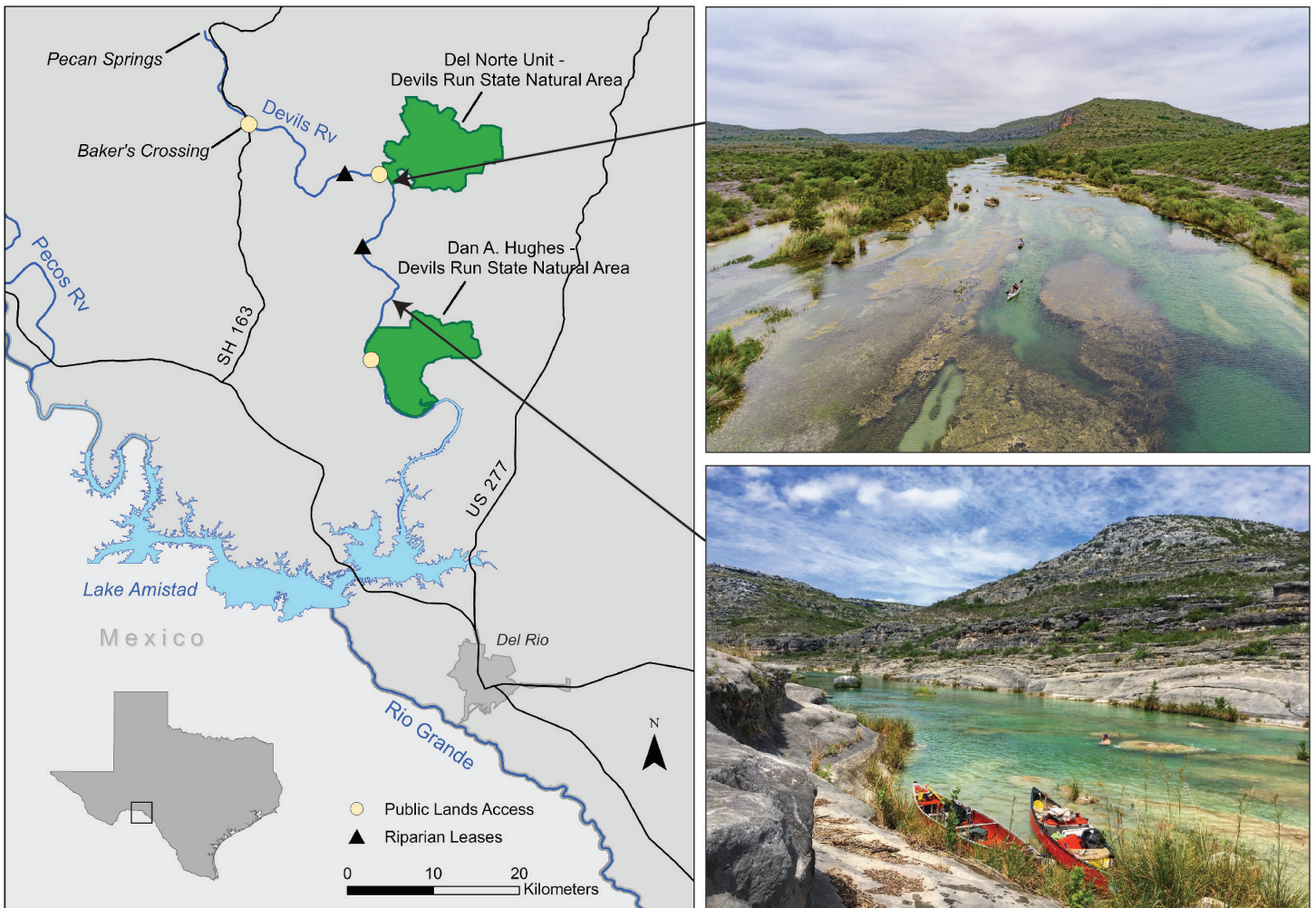


Figure 2. Devils River near the City of Del Rio, Texas, with locations of public river access areas at public riparian lands and at private riparian lands leased through the River Access and Conservation Areas Program. Inset photos provide examples of the Devils River landscape.

leased through RACA to help quell landowner concerns. This resulted in removal of 682 tires and over 2500 kg of litter, including nearly 500 kg of recyclable materials. Additionally, the Texas Council of FFI distributed more than 5000 river cleanup bags to their network of local fly-fishing clubs who conducted trash removal in conjunction with routine fishing outings. Those efforts helped build good will among riparian landowners and local communities and set expectations for ethics and etiquette among user groups by demonstrating principles of the “leave no trace” ethic.

Another significant issue that historically inhibited river access and recreation in Texas has been conflicts between recreational users and riparian landowners, primarily resulting from trespassing. This issue has been most pronounced on the Devils River, where paddlers attempting multi-day, overnight paddle trips frequently set up illegal campsites on private riparian lands (Devils

River Conservancy [DRC] 2016, Robertson 2018, Robertson et al. 2019). To address this issue, TPWD negotiated leases with owners of private riparian properties strategically located along the river mid-distance between existing public access areas (Figure 2). TPWD then installed paddler campsites at the leased properties, with reservations managed through the TPWD State Parks Reservation System. Prior to the leases being established, distances between public access areas and legal campgrounds were too far for many paddlers to travel in a single day, which led to illegal camping on private lands or paddling during nighttime hours. Night paddling, in turn, often led to capsizing of paddle craft and dumping of camping gear and other supplies into the river. Since the leased campsites were established, surveys have documented less trash on the river and an improved recreational experience for paddlers and anglers (DRC 2016, 2017a, 2017b, Robertson 2018).

Furthermore, Robertson (2018) compared citations issued during the initial 10 months of the access areas being open to paddlers to the same 10-month period the prior year. Although river patrols by Texas game wardens increased, a decrease occurred in the number of citations issued, including decreases in trespassing and littering violations.

Discussion

This innovative approach utilizing public-private partnerships to increase angling opportunities on Texas rivers has now advanced beyond the proof-of-concept phase. Through the recent allocation of dedicated staff and additional operational funds, the number of access areas supported through RACA is expected to expand. In addition to expanding paddling and fishing opportunities, RACA has served as the impetus for increased investments in river stewardship by fostering collaboration among riparian landowners, local communities, non-governmental organizations, and recreational users. In doing so, RACA has facilitated leveraging of personnel, expertise, project funding, in-kind contributions, and other resources toward delivery of grassroots-driven river stewardship projects. An important step taken to facilitate grassroots engagement was investment of modest financial support through RACA in the operations of local non-profit organizations. In-kind contributions and cost-share grants from TPWD helped increase capacity to organize and deliver public outreach events and river stewardship projects.

An additional lesson learned from implementation of RACA was recognition of the importance of building relationships with early adopters and trendsetters willing to cooperate on the development of public river access areas. These individuals generally consisted of locally respected landowners, ranch managers, anglers, and river conservation advocates who offered their endorsement of the concepts promoted by RACA. These individuals were identified through consultation with other local conservation practitioners, such as state and federal agency wildlife biologists, who offer technical guidance and extension services and who tend to be well-connected within local communities.

Through careful selection of the initial river access areas supported through RACA (with consideration of the criteria outlined in Table 2), we were able to effectively demonstrate the feasibility and benefits of this approach, including local economic value created by enhancing river access. The resulting proof-of-concept was showcased and promoted to neighboring communities and landowners, which facilitated upstream and downstream expansion along some rivers and offered case studies transferable to others. Although public river access opportunities in Texas still remain relatively limited, RACA offers an innovative approach that has

undeniably gained the support of riparian landowners and recreational users, enhanced the state's outdoor economy, and increased awareness and use of the river angling and paddling opportunities in Texas.

Acknowledgments

We thank Dr. Sarah Haas and Karim Aziz for development of the figures used in this article. We thank the numerous cooperators and volunteers who actively contributed to the development and implementation of RACA, especially the staff, leadership, and volunteers of All Water Guides, Devils River Conservancy, Hill Country Alliance, Llano River Watershed Alliance, Keep Texas Beautiful, and Texas Council of FFI. Their interest, dedication, and substantive contributions are appreciated, and we look forward to building upon our shared vision and partnership to continue to enhance angling and paddling opportunities on Texas rivers. Funding for implementation of RACA was provided by the U.S. Department of Agriculture Voluntary Public Access and Habitat Incentive Program (VPA-HIP), U.S. Fish and Wildlife Service Sport Fish Restoration Recreational Boating Access Grant Program, Texas Parks and Wildlife Foundation, and TPWD. We offer our sincere appreciation to Chuck Kowaleski (TPWD Farm Bill Coordinator) for his support in securing initial funding for RACA through VPA-HIP. We also thank Dr. Steven Sammons and three anonymous reviewers for their helpful comments and improvements to this article.

Literature Cited

- Anderson, R., A. Engeling, A. Grones, R. Lopez, B. Pierce, K. Skow, and T. Snelgrove. 2014. Status update and trends of Texas rural working lands. Texas A&M University, College Station.
- Association of Fish and Wildlife Agencies (AFWA). 2012. National Fish Habitat Action Plan, 2nd Edition. Association of Fish and Wildlife Agencies, Washington, D.C.
- Birdsong, T. W., J. Botros, S. Magnelia, J. Anderson, M. Bean, T. Broad, D. Cortez, T. Grabowski, C. Kowaleski, C. Chute-Canal, J. East, K. Glenwinkel, B. Hester, R. Husted, J. Joplin, J. Lewey, S. Nichols, D. Oppenheimer, M. Parker, S. Robertson, and A. Stevens. 2019. Texas River Access and Conservation Areas Program: partnering with private landowners to expand paddling and fishing opportunities on Texas rivers. Texas Parks and Wildlife Department PWD-RP-T3200-2080, Austin.
- Cummings, G. and M. De Jesus. 2017. Survey report for the Colorado River Hwy 183 bridge crossing, Austin to SH 71 bridge crossing, La Grange Texas, Texas Parks and Wildlife Department, Federal Aid in Sportfish Restoration Project F-221-M-2, Austin.
- Devils River Conservancy (DRC). 2016. Devils River working days report. Devils River Conservancy, Austin, Texas.
- _____. 2017a. Devils River working days I report. Devils River Conservancy, Austin, Texas.
- _____. 2017b. Devils River working days II report. Devils River Conservancy, Austin, Texas.
- East, J. and J. Botros. 2018. Resource conservation plan for the Sabine An-

- gler Access and Conservation Area at the Grand Bluff Boat Ramp in Carthage, Texas. Texas Parks and Wildlife Department, Austin.
- Impact DataSource. 2012. A report of the economic impact of water recreation tourism in unincorporated parts of Comal County, Texas. Water Oriented Recreation District, Canyon Lake, Texas.
- Kennedy, B. 2002. If a river runs through it, what law applies? *The Texas Prosecutor Journal*. Texas District and County Attorneys Association, Austin.
- Magnelia, S. J. 2018. Resource conservation plan for the lower Colorado River, Travis and Bastrop counties, Texas. Texas Parks and Wildlife Department, Austin.
- ____ and M. De Jesus. 2018. Resource conservation plan for the Canyon Reservoir Tailrace River Access and Conservation Areas in Comal County, Texas. Texas Parks and Wildlife Department, Austin.
- Robertson, S. 2018. Devils River recreational use assessment: evaluation of river stewardship outcomes achieved through establishment of the mile 12 and mile 20 paddler camps. Texas Parks and Wildlife Department, Austin.
- ____, B. D. Wolaver, T. G. Caldwell, T. W. Birdsong, R. Smith, T. Hardy, J. Lewey, and J. Joplin. 2019. A multidisciplinary approach to developing the science and public support to maintain instream flows in the Devils River: a case study in collaborative conservation. Pages 293–314 *in* D. C. Dauwalter, T. W. Birdsong, and G. P. Garrett, editors. *Multispecies and Watershed Approaches to Freshwater Fish Conservation*. American Fisheries Society, Symposium 91, Bethesda, Maryland.
- Southeast Aquatic Resources Partnership (SARP). 2014. Conserving fish habitat from rivers to the sea: the story of the Southeast Aquatic Resources Partnership. Social Circle, Georgia.
- Sweeney, R. D. 2016. Riverbeds and banks: title and regulatory issues. *Real Estate, Probate, and Trust Law Reporter* 54:4: 62–73.
- Texas Parks and Wildlife Department (TPWD). 1974. An analysis of Texas waterways: a report on the physical characteristics of river, streams, and bayous in Texas. Austin, Texas.
- The Outdoor Foundation. 2013. A special report on paddlesports: kayaking, canoeing, rafting, and stand up paddling. Washington, D.C.
- ____. 2014. A special report on paddlesports: kayaking, canoeing, rafting, and stand up paddling. Washington, D.C.
- ____. 2015. A special report on paddlesports: kayaking, canoeing, rafting, and stand up paddling. Washington, D.C.
- The Outdoor Industry Association. 2009. A special report on paddlesports: kayaking, canoeing, and rafting. Washington, D.C.
- Thomas, Z. A. and T. L. Arsuffi. 2015. Assessing landowner attitudes toward the development of a paddling trail on the South Llano River and recreationist attitudes toward recreational paddling. Texas Tech University Llano River Field Station, Junction.
- ____, _____, and S. J. Magnelia. 2015. Fishing warmwater streams with limited public access: angling behavior, economic impact, and the role of Guadalupe bass in a twenty-four county region of Texas. Pages 123–137 *in* M. D. Tringali, J. M. Long, T. W. Birdsong, and M. S. Allen, editors. *Black Bass Diversity: Multidisciplinary Science for Conservation*. American Fisheries Society, Symposium 82, Bethesda, Maryland.
- U.S. Environmental Protection Agency (USEPA). 2002. 2000 National Water Quality Inventory Report. Washington, D.C.
- U.S. Fish and Wildlife Service (USFWS) and U.S. Census Bureau (USCB). 2018. 2016 National survey of fishing, hunting, and wildlife-associated recreation. Washington, D.C.