UPPER LLANO RIVER WATERSHED PROTECTION PLAN NEWSLETTER

ISSUE 4

JANUARY 2015

YEAR IN REVIEW: THE UPPER LLANO WATERSHED PROTECTION PLAN

Welcome to the fourth Upper Llano River Watershed Protection Plan (WPP) newsletter and thank you for your continued interest in preserving our valuable resource.

Last year we took many strides in developing the WPP, along with saying goodbye to a great friend and watershed supporter, Daryl Stanley. Daryl's love of the North Llano was evident and his passion for protection unparalleled. Daryl will be missed and we thank him and his family for all of his hard work on the WPP.

Other Coordination Committees have relocated or accepted new positions. Fred Gregg, former South Llano River State Park Superintendent relocated to a new Texas Parks and Wildlife Department position. Marvin Ivy former City of Junction Chief of Police officially retired from duty. Mr. Gregg and Mr. Ivy put in many hours in the development of the WPP and we thank them for their leadership.

Other notable news: Former Kimble County Judge and Coordination Committee member Andrew Murr was elected as a State Representative – congratulations!!!

Since the last newsletter, the Science Team has been diligently working to model various best management practices (BMPs) recommended by the Working Groups that enhance the quantity and quality of runoff and recharge. In addition, writing of the introductory chapters of the WPP began, Working Groups met, and water quality sampling continued and completed for the project in January 2015. Look for a review of modeling and water quality monitoring results in the next edition of the newsletter.

In 2015, it is expected that the Coordination Committee will meet on a regular basis to begin review of components of the WPP and agree on best management practices with the anticipation of a completed draft of the document by summer. Public input will be solicited throughout the process. Upon incorporation of comments, the draft WPP will be made publicly available.

For more information on the WPP, plan to attend the February 5th Coordination Committee meeting or visit the South Llano Watershed Alliance at southllano.org, or contact Tom Arsuffi at the Llano River Field Station. Thank you again for your interest and we look forward to seeing you at upcoming events!

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FISHING WARMWATER STREAMS WITH LIMITED PUBLIC ACCESS:

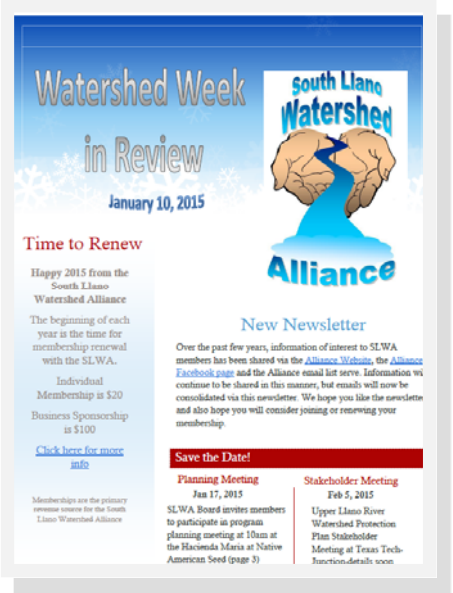
Angling behavior, economic impact, and the role of Guadalupe Bass in a 24-county region in Texas

BY: ZACK THOMAS, TOM ARSUFFI AND STEVE MAGNELIA

This article was originally printed in Black Bass Diversity: Multidisciplinary Science for Conservation. American Fishery Society Publications. 2014.

The Guadalupe Bass, *Micropterus treculii*, is a Central Texas endemic black bass species occurring only in streams and rivers draining the Edwards Plateau ecoregion. It is designated the State Fish of Texas and provides a popular sport fishery. In addition to being a popular sport fish, it is listed as a species of special concern due to habitat degradation and hybridization with smallmouth bass (*Micropterus dolomieu*). Past socioeconomic surveys of Texas black bass anglers have focused primarily on reservoir fisheries, while little is known about fishing patterns, economic impact and preferences of river and stream anglers. A Web-based open-access survey was used to quantify fishing characteristics, assess attitudes, and the economic impact of anglers fishing rivers and streams in a 24-county region of Texas from August 20, 2011 to December 20, 2012, with a focus on anglers who specifically fished for Guadalupe Bass. A total of 700 respondents participated in the survey. Over half of respondents were paddlers targeting black bass, and 42% specifically fished for Guadalupe Bass on their trips. An additional 34% of anglers listed black bass species, which included Guadalupe bass as their most preferred species. Similar to previous surveys of Texas river and stream anglers, access was identified as the largest impediment to the future maintenance and improvement of river and stream fishing. Based on 563 surveys used in the economic impact analysis, using IMPLAN® (Impact Analysis for Planning) software, an estimated $74,182,080 in direct angler expenditures was spent on fishing trips to the study region, resulting in a total economic impact (including indirect and induced impacts) of $71,552,492 and supported 776 full-time jobs. These findings indicate the economic importance of river and stream angling to the Texas economy the role of Guadalupe Bass in a 24-county region in Texas Resources Conservation Service.

Guadalupe bass fingerlings acclimating to river conditions before release into the South Llano River. Image courtesy of Texas Parks and Wildlife Department.



The South Llano Watershed Alliance launched "Watershed Week in Review," a new newsletter.

Over the past few years, information of interest to SLWA members has been shared via the Alliance Website, the Alliance Facebook page and the Alliance email list serve. Information will continue to be shared in this manner, but emails will now be consolidated via this newsletter.

GUADALUPE BASS WORKSHOP BY: MEAGN BEAN

This article was contributed by Texas Parks and Wildlife Department.

The South Llano Watershed Alliance and Texas Tech University Llano River Field Station hosted a symposium in October that provided information and updates about the Guadalupe Bass Restoration Initiative. This initiative is an innovative approach to fish and wildlife conservation through the engagement of many partners collaborating in watershed scale conservation and restoration to protect native aquatic species and habitats. One of the unique, native fishes found only in Texas is the State Fish of Texas, the Guadalupe Bass. Populations of Guadalupe Bass throughout its native range are threatened by hybridization with Smallmouth Bass, poor habitat quality, and increased water demands from human population growth. The Initiative is addressing these threats by conducting and collaborating in activities and restoration projects that are protecting and restoring important terrestrial, riparian, and aquatic habitats; reducing fragmentation of habitats; reducing erosion and unstable river banks; and reducing impacts of non-native species. The Initiative is also directing research to fill in information gaps, inform priorities for future restoration projects, and engaging the community in conservation stewardship. Here are some highlights from the presentations which will be posted on the South Llano Watershed Alliance website (www.southllano.org).

· A recent study by Texas Tech University Llano River Field Station and Texas Parks and Wildlife Department observed a local annual economic impact of $74 million from stream fishing in the Texas Hill Country, with 42% of those surveyed specifically targeting Guadalupe Bass. The Llano River and its tributaries support healthy populations of Guadalupe Bass and rank at the top of the list among Hill Country rivers as a destination for Guadalupe Bass fishing.

· These high quality fishing opportunities and associated economic benefits to businesses and local communities of the Hill Country are dependent upon healthy rivers and streams and suitable habitat conditions for species. Texas Parks and Wildlife recognizes the unique value of Hill Country rivers and since 2010, has invested more that $3.2 million in monitoring, research, and habitat restoration. This investment has included $400,000 in landowner incentives that resulted in restoration or enhancement of over 8,500 acres of habitat and improved land management practices on over 100,000 acres in the Hill Country. Habitat restoration projects have focused on sensitive aquatic habitats including aquifer recharge features, springs, creeks, and streams, as well as important streamside habitats. Many properties where successful projects have been implemented are now serving as conservation demonstration areas. These areas are showcasing best management practices and serving as catalysts for coordinated, science-based conservation of aquatic resources throughout the region.

· Guadalupe Bass face several threats throughout their range such as hybridization with Smallmouth Bass, and diminished habitat and water quality and availability to name a few. Several research studies by Texas Tech University, Texas State University – San Marcos, and Texas Parks and Wildlife have looked at the species' hybridization with Smallmouth Bass, where Guadalupe Bass prefer to live in the river, what they typically eat, how far the species will travel, how river flow impacts growth, and success of stocking programs to facilitate genetic restoration. Guadalupe Bass were found to stay mostly around one home site with a small number of fish travelling up to 2 miles around breeding season. Different rivers in the Guadalupe Bass's range have different genetic characteristics and to preserve this genetic diversity, management strategies of these different populations are being considered at the sub-watershed scale. The proportion of hybrids in the South Llano River before stocking pure Guadalupe Bass was around 4%. Texas Parks and Wildlife has been stocking pure Guadalupe Bass in an effort to "swamp out" the hybrids and create a more pure population. As of 2014, the percentage of hybrids is now less than one percent. Future management of Guadalupe Bass will be directed by a range-wide management plan that is currently being developed by Texas Parks and Wildlife Department.

Adult Guadalupe bass. Image courtesy of Texas State University: Fishes of Texas.

IF ONLY WE KNEW BY: TOM ARSUFFI

Most human beings have an almost infinite capacity for taking things for granted.
Aldous Huxley. Themes and Variations. 1950

Let's start off with a given for most of us, certainly me…….who doesn't like free? The definition of free is, "costing nothing". Depending on what kind of free things we are talking about though, there may be hidden costs we need to be aware. Part of the human condition is that free things, especially if they come on a regular basis, are things that can be taken for granted. When things are taken for granted, their importance are frequently overlooked, and in a worst case, abused. What is worse is if the collective "we" are not even aware of all the free stuff we are getting, which greatly increases the likelihood of taking things for granted.

The natural world in which we live provides lots of free stuff, stuff that provides not only value to our life and well being, but also of significance economically. That means $$$$, big bucks. If we only knew. This area of ecological research got a real jump start in 1997, by an ecologist Robert Costanza, who wrote a paper titled:
The value of the world's ecosystem services and natural capital.
How much did Costanza find that nature provides for free if we put a $$ value to it - **$33 trillion per year in 1997 and in an updated 2014 paper, the free ecosystem services is valued at $125 trillion dollars.** In comparison, human global gross national product totals around $18 trillion per year. Ecosystem Services fall into four broad categories: *provisioning*, such as the production of food and water; *regulating*, such as the control of climate and disease; *supporting*, such as nutrient cycles and crop pollination; and *cultural*, such as spiritual and recreational benefits.

Beautiful landscape of the Texas Hill Country. Image courtesy of Hill Country Real Estate.

Unfortunately, our society is becoming increasingly urban, disconnected from nature and increasingly natural resource illiterate. We are damaging and impairing the ability of nature to provide those free things. And when we do, we have to come up with expensive and sometimes artificial technological replacements - like a water treatment plant to replace a wetland. Zack Thomas, now with Texas Parks and Wildlife just published a study showing fishing for Guadalupe bass in Hill Country streams has a $75 million dollar impact. That is a big underestimate, but it shows one ecosystem value of keeping water flowing in our streams.

There is a broad array of ecosystem services accrued by managing rangeland for invasive brush. These services include wildlife habitat; recreation (including that associated with wildlife); watershed functions; carbon sequestration, biodiversity conservation, restored desirable vegetative cover to protect soils; control erosion; reduce sediment; improve water quality and enhance stream flow; improve forage accessibility, quality, and quantity for livestock; and protect life and property from wildfire hazards. To fully evaluate the benefits/costs and net value of brush control, a more holistic and comprehensive economic valuation is required and necessary. Good land stewardship helps preserve those beneficial ecosystem services. That's good news for our future generations and good news for Guadalupe bass and our springs, rivers and streams.

"When something does not insist on being noticed, when we aren't grabbed by the collar or struck on the skull by a presence or an event, we take for granted the very things that most deserve our gratitude"
-Cynthia Ozick

COMMON MACROINVERTEBRATES OF THE UPPER LLANO WATERSHED

Monitoring efforts of the Watershed Protection Plan are well underway, which include water quality, flow, and biological sampling (this includes aquatic macroinvertebrates, fish, and habitat monitoring). Questions are often asked about the diversity of species in the North and South Llano rivers. This quick guide will focus on macroinvertebrates. Macroinvertebrates , or more commonly called bugs, are named for 'macro'=big enough to see with the naked eye and 'invertebrate'=lacking a backbone. Macroinvertebrates spend part or all of their life in water, and include insects and crustaceans, among many others. Macrinvertebrates are indicator species of the health of the river. Some species are much more sensitive than others to pollutants that might not be detected in traditional water quality sampling.

Similar macroinvertebrate species are found in both rivers and a few common species are described below.

The **caddisfly** is known for it's ability to build protective casings. These casings, often found on the underside of in stream rocks, are often ornate and can even be made into jewelry. Caddisflies are often mistaken for small moths, and are closely related to both moths and butterflies. Caddisflies are popular bait for fishermen.

Adult caddisfly (top), ornamental caddisfly casing (middle), and caddisfly fishing lures. Images courtesy of BugGuide.net and Seaway blog and Trout Fly Fishing Lures.

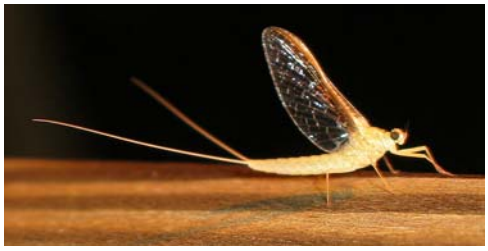
Damselflies are often mistaken for dragonflies. Damselflies have longer, more slender bodies than dragonflies. They are considered beneficial species because they eat other insects such as mosquitos. Although there are a variety of damselflies found in the Upper Llano, the ruby-spotted damselfly has some of the most distinctive coloration.

Damselfly larvae (left) and adult ruby-spotted damselfly (right). Images courtesy of TJ's Garden and TAMU Bugs in the City.

The **water penny,** named for it's resemblance to a penny, belongs to the beetle family. The larval stage of the water penny is shaped like a coin; however, the adult form is a beetle. Water pennies need well oxygenated water; therefore, they are an indicator of good water quality.

Water penny on a rock. Image courtesy of BugGuide.net.

Mayflies are quite common in the Upper Llano. They are delicate insects; sensitive to water quality, and they have a short lifespan from a few minutes to a few days. Mayflies are popular bait of fishermen; fishing lures are tied to resemble them.



Adult mayfly. Image courtesy of Words4it.com

Contact us!

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Recent and Upcoming Events

- **Texas Water Symposium:** November 20
  Recording available on Texas Public Radio
- **Coordination Committee of the WPP meeting:** February 5
  Texas Tech Llano River Field Station in Packard Hall– Visit SouthLlano.org for meeting agenda
- **Land Stewardship for Brush Contractors:** February 6 beginning at 7:30AM
  Texas Tech Llano River Field Station—Email cfaas@texas-wildlife.org for more info