Abilene Reservoir

2023 Fisheries Management Survey Report

PERFORMANCE REPORT

As Required by

FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

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Survey and Management Summary

Fish populations in Abilene Reservoir were not surveyed with the prescribed sampling schedule from Goldstrohm and Homer (2020) during the 2020-2024 survey period because of drought and low water level.

Reservoir Description: Abilene Reservoir is a 640-acre impoundment constructed on Elm Creek in the Brazos River Basin, and it is approximately 18 miles southwest of Abilene, Texas. The reservoir's primary function is recreation, but it historically provided some municipal water supply to City of Abilene. In 2005, operation and control of the reservoir was transferred from City of Abilene to Texas Parks and Wildlife Department (TPWD) – Abilene State Park. The reservoir experiences extreme water level fluctuations and went completely dry in spring 2014. Between winter 2015 and the spring 2016, the reservoir filled to over conservation pool elevation. The reservoir water level has rapidly declined and was nearly 19 ft. below conservation pool elevation by spring 2024.

Management History: After TPWD – Abilene State Park took control of the reservoir, harvest regulations for Channel Catfish were changed to a no minimum length limit and a five-fish daily bag limit. Management stockings of Gizzard Shad and sunfishes were conducted in spring 2016 to reestablish the prey species community following reservoir refill. Following the prey species stockings, Bluegill, Channel Catfish, and Florida Largemouth Bass were stocked in 2016 and 2017. White Crappie were stocked in 2016. Largemouth Bass fingerlings were stocked in 2017 and 2021.

Fish Community

- **Prey species:** No species were surveyed because of drought and low water level.
- **Channel Catfish:** No species were surveyed because of drought and low water level.
- **Largemouth Bass:** Largemouth Bass were not surveyed because of drought and low water level.
- **White Crappie:** White crappie were not sampled because of drought and low water level.

Management Strategies: Species will be surveyed with exploratory electrofishing once the reservoir is accessible and at ≥ 80% capacity as well as after fisheries recovery stockings are conducted.

Introduction

The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. However, prescribed monitoring surveys (Goldstrohm and Homer 2020) were not conducted during the 2020-2024 monitoring period because the reservoir was inaccessible because of drought and low water level.

Reservoir Description

Abilene Reservoir is a 640-acre impoundment that was built in 1921 on Elm Creek in the Brazos River Basin, and it is approximately 18 miles southwest of Abilene, Texas. The reservoir's primary function was recreation, but it has also historically provided some municipal water supply to City of Abilene. In 2005, operation and control of the reservoir was transferred from City of Abilene to Texas Parks and Wildlife Department (TPWD) – Abilene State Park. The reservoir has been subject to extreme fluctuations in water level due to drought. Prior to this sampling period, Abilene Reservoir experienced three severe low-water periods, in the mid-1980s and late 1990s-early 2000s. During the third event, the reservoir went completely dry by spring 2014 then caught about eight feet of water between winter 2015 and spring 2016, then rose to over conservation pool (2,012 ft. above mean sea level). Subsequently, the water level fluctuated often, rising during periods of heavy rain and decreasing rapidly during low rainfall periods. Since spring 2021 the reservoir rapidly declined. By spring 2024, the reservoir was nearly dry and about 19 ft. low (Figure 1). Other descriptive characteristics for Abilene Reservoir are in Table 1.

Angler Access

A fee and pass are required for state park entry. A fishing pier is located at the south corner of the dam. There are two public boat ramps on the reservoir. During most of the survey period, both ramps were inaccessible. Additional boat ramp characteristics are in Table 2.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Goldstrohm and Homer 2020) included:

1. Monitor Largemouth Bass and prey populations to determine trends in relative abundance, size structure, and body condition by conducting an electrofishing survey in 2020 and 2023.

   Action: Fishes were not sampled during the monitoring period because the reservoir was inaccessible.

2. Monitor Florida Largemouth Bass genetic integration by collecting genetic samples from Largemouth Bass in 2023 since Florida Largemouth Bass have recently been stocked in 2016 and 2017.

   Action: Largemouth Bass genetics were not monitored in the reservoir during the monitoring period.

3. Conduct an exploratory tandem hoop net survey in late spring 2024 to assess relative abundance, size structure, and body condition of Channel Catfish.

   Action: Exploratory tandem hoop netting could not be conducted during the monitoring period.

4. Discuss potential boater access and fish habitat improvements with Abilene State Park.

   Action: Abilene State Park and TPWD IF-Abilene has had multiple discussions concerning access to Abilene Reservoir as well as habitat improvements. Multiple concerns pertaining to the poor state of the dam and potential water loss, excess sedimentation, as well as the water regimes associated with drought were also brought up as concerns. Abilene State Park also met with City of Abilene in 2022 to discuss

concerns with water loss from the dam that was causing flooding in the park proper, but no additional actions have been taken since.

5. Educate the public about the threats of invasive species.

   Action: There were signs that were posted and maintained that educate about the threat of invasive species. Media and internet post have been made about invasive species. Invasive species was a talking point when presenting to constituents.

Harvest regulation history: Prior to 2005, fish populations were managed with statewide harvest regulations. Once TPWD – Abilene State Park assumed control of the reservoir in 2005, all sport fish, except Channel Catfish, have been managed with statewide harvest regulations. Channel Catfish have been managed with no minimum length limit and five-fish daily bag limit, the same regulation used in other water bodies entirely enclosed within state park boundaries. Harvest regulations for sport fish are listed in Table 3.

Stocking history: Abilene Reservoir's fish populations have been maintained by stockings of multiple species following reservoir refill events. In 2016, the reservoir was stocked with Gizzard Shad, Bluegill, Fathead Minnows, Orangespotted Sunfish, Longear Sunfish, Channel Catfish, Florida Largemouth Bass, and White Crappie. Bluegill, Florida Largemouth Bass, and Channel Catfish were stocked in 2017. Largemouth Bass were also stocked in 2021. A complete stocking history is presented in Table 4.

Vegetation/habitat management history: Cypress trees and American lotus were planted in the 1990's, but the establishment of these species was unsuccessful. Mossback structures were deployed around the fishing pier in 2016 and 2017. In 2019, Fishiding structures were deployed near the fishing pier.

Water transfer: No interbasin water transfers exist.

Methods

Surveys were not conducted because of drought and low water level.

Water level – Source for water level data was the United States Geological Survey (USGS 2024).

Results and Discussion

Habitat: Habitat was last surveyed in summer 2019, and the results can be found in Goldstrohm and Homer (2020).

Prey species: No species were surveyed because of drought and low water level.

Channel Catfish: No species were surveyed because of drought and low water level.

Largemouth Bass: Largemouth Bass were not surveyed because of drought and low water level.

White Crappie: White Crappie were not sampled because of drought and low water level.

Prior to the drought, fisheries recovery efforts from the prior drought were promising. When the reservoir was over 80% full, aquatic vegetation was present in good coverage, and notable species included American waterwillow, American pondweed, and variable-leaf pondweed. Stockings and natural reproduction of Largemouth Bass, Gizzard Shad, White Crappie, and Bluegill were successful in allowing for recruitment of individuals (Goldstrohm and Homer 2020). Anecdotally, anglers reported to TPWD IF-Abilene staff of catches of Largemouth Bass up to 8 lbs. and White Crappie >2 lbs. in 2022 and 2023. Reports on Channel Catfish catches by anglers were not received during the survey period. In early spring 2024, reports of a fish kill were received and confirmed by TPWD, which the event was attributed to hypoxia.

Fisheries Management Plan for Abilene Reservoir, Texas

Prepared – July 2024

ISSUE 1: The Abilene Reservoir dam is one of the oldest in the state. The dam was constructed in 1921, and the last major improvement to its infrastructure was made in the 1980's. As the reservoir has aged, the dam has developed several issues which has likely exacerbated the reservoir's water level fluctuations. City of Abilene controls the rights to the reservoir, while TPWD leases the property enclosing the reservoir. Abilene State Park first notified City of Abilene of the issues in 2016, and multiple meetings have been held since. Major improvements and repairs have still not been completed.

MANAGEMENT STRATEGIES:

1. Discuss issues with water levels and the dam with City of Abilene, TPWD State Parks Division, and other stakeholders to identify potential strategies to address the issues with the dam.
2. Work with the City of Abilene, Texas Water Development Board, Soil and Water Board, and other potential partners to seek and secure funding to repair the dam as well as for addressing habitat issues.

ISSUE 2:I Historically, Abilene Reservoir has been a popular Largemouth Bass and White Crappie fishery. However, fisheries have only been viable for a few years because of the frequency of droughts and water loss associated with issues with the dam infrastructure. Thus, fisheries have been repetitively devastated at this reservoir. Stockings following water level increases have been necessary to restore sport fishes and prey following substantial water level increases.

MANAGEMENT STRATEGIES

1. Conduct management stockings to restore prey and White Crappie fisheries once water level is >80% capacity.
2. Consider stocking Largemouth Bass at 1,000/shoreline km should the reservoir increase to >80% full.
3. Sampling of the reservoir will occur opportunistically following a water level rise to >80% full and after one year of any recovery stockings. Otherwise, no planned sampling or management activities will take place and reporting will no longer take place on the traditional rotation.

ISSUE 3: Abilene Reservoir is subject to rapidly fluctuating water levels which can have major implications to fisheries and access. During low water periods, boat access at the ramp near the dam becomes unavailable and there is limited designated parking at the west boat ramp available for vehicles with trailers.

MANAGEMENT STRATEGIES

1. Should issues with the dam be resolved, identify opportunities for additional habitat enhancement efforts and coordinate with City of Abilene, TPWD – Abilene State Park, and other potential partners.
2. Continue discussions about boat access improvements. Develop a plan that could be implemented during an extended period of low water level.

ISSUE 4: Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example,

zebra mussels (*Dreissena polymorpha*) can multiply rapidly and attach themselves to any available hard structure, restricting water flow in pipes, fouling swimming beaches, and plugging engine cooling systems. Giant salvinia (*Salvinia molesta*) and other invasive vegetation species can form dense mats, interfering with recreational activities like fishing, boating, skiing, and swimming. The financial costs of controlling and/or eradicating these types of invasive species are significant. Additionally, the potential for invasive species to spread to other river drainages and reservoirs via watercraft and other means is a serious threat to all public waters of the state.

MANAGEMENT STRATEGIES

1. Cooperate with the controlling authority to post and maintain appropriate signage at access points around the reservoir.
2. Educate the public about invasive species through the use of media and the internet.
3. Make a speaking point about invasive species when presenting to constituent and user groups.
4. Keep track of (i.e., map) future inter-basin water transfers to facilitate potential invasive species responses.

Objective-Based Sampling Plan and Schedule (2024–2028)

Abilene Reservoir has a history of extreme water level fluctuations attributed to prolonged droughts. The reservoir has gone completely dry and has been unsampleable during multiple monitoring periods, which fish populations drastically declined or were completely lost then reestablished through stockings following substantial increases in water level. During the prior monitoring period, objective-based sampling could not be conducted.

In the 2024-2028 monitoring period, exploratory sampling by electrofishing will be attempted opportunistically following a substantial increase in water level (i.e., ≥ 80% capacity and ≥ one year post stocking to assess success of any fisheries recovery stockings. No target objectives for baseline CPUE and length frequency will be attempted.

Literature Cited

Goldstrohm. N. and M. D.,Homer, 2020. Statewide freshwater fisheries monitoring and management program survey report for Abilene Reservoir, 2019. Texas Parks and Wildlife Department, Federal Aid Report Grant 221-M-4, Austin, Texas.

United States Geological Survey (USGS). 2024. National water information system: Web interface. Available: http://waterdata.usgs.gov/tx/nwis (May 2024).

Tables and Figures

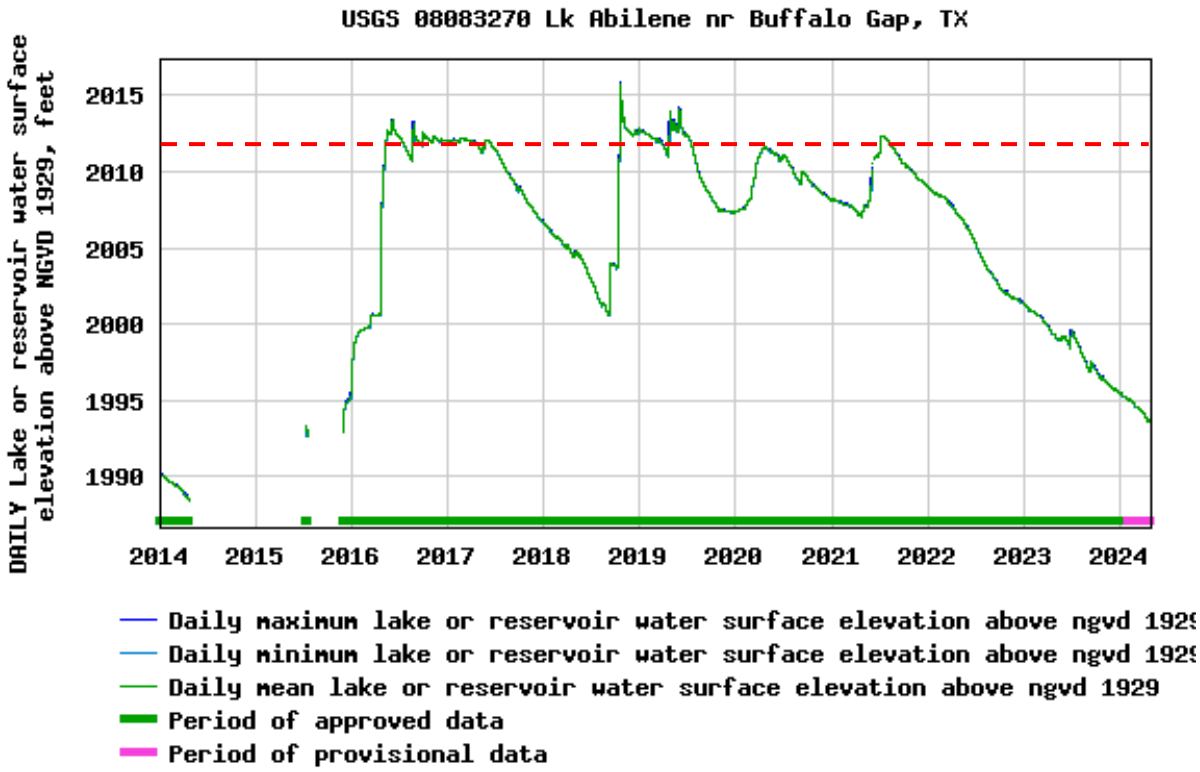

Figure 1. Daily water level data for Abilene Reservoir, Texas, January 2014- May 2024 (USGS 2024). Water level data is missing from 2014-2016 because the reservoir's water level was too low to be detected by the gauge. NGVD 1929 refers to the National Geodetic Vertical Datum of 1929. The dashed line indicates the conservation pool elevation (2,012 ft above NGVD).

Table 1. Characteristics of Abilene Reservoir, Texas.

Characteristic	Description
Year constructed	1921
Conservation pool	2,012 feet above mean sea level
Maximum depth	1,987 feet above mean sea level
Controlling authority	City of Abilene
County	Taylor
Reservoir type	Tributary
River basin	Brazos River Basin
Shoreline Development Index	2.27
US Geological Survey 8-Digit Hydrologic Unit Code for Watershed	12060102 (Upper Clear Fork Brazos)
Conductivity	672 µS/cm

Table 2. Boat ramp characteristics for Abilene Reservoir, Texas, May 2024. Reservoir elevation at time of survey was 2,009.5 feet above mean sea level.

Boat ramp	Latitude Longitude (dd)	Public	Parking capacity (N)	Elevation at end of boat ramp (ft)	Condition
Dam Ramp	32.232234 -99.890853	Y	10	2,005	Inaccessible; Out of water
West Boat Ramp	32.233609 -99.903101	Y	10	2,004	Inaccessible; Out of water

Table 3. Harvest regulations for Abilene Reservoir, Texas.

Species	Bag limit	Length limit
Catfish: Channel	5 (in any combination)	no minimum
Bass, Largemouth	5	14-inch minimum
Crappie: White and Black Crappie, their hybrids and subspecies	25 (in any combination)	10-inch minimum

Table 4. Stocking history of Abilene Reservoir, Texas. FGL = fingerling; ADL = adults.

Species	Year	Number	Size
Gizzard Shad	2016	486	ADL
Bluegill	2001	81,238	FGL
	2016	27	ADL
	2016	31,362	FGL
	2017	63,999	FGL
	Total	176,626	
Longear Sunfish	2016	6	ADL
Orangespotted Sunfish	2016	9	ADL
Fathead Minnow	2016	6,944	ADL
Blue Catfish	1995	36,883	FGL
	1996	64,429	FGL
	2004	59,893	FGL
	Total	161,205	
Channel Catfish	1970	550	FGL
	1973	200,000	FGL
	1974	10,000	FGL
	1998	19,362	FGL
	2004	53,981	FGL
	2005	401	FGL
	2016	58,808	FGL
	2017	65,379	FGL
	Total	408,481	
Florida Largemouth Bass	1988	64,000	FGL
	1991	30,030	FGL
	1994	64,026	FGL
	2009	59,516	FGL
	2016	55,367	FGL
	2017	73,808	FGL
		10,293	FGL
	Total	357,030	
Largemouth Bass	2005	63,695	FGL
Palmetto Bass	1977	6,500	FGL
	1979	7,400	FGL
	Total	13,900	
White Crappie	2016	117	ADL

Proposed Sampling Schedule

Table 5. Proposed sampling schedule for Abilene Reservoir, Texas. Survey period is June through May. Electrofishing surveys are conducted in the fall. Surveys and the report are indicated by year and denoted by X.

	Survey year			
	2024-2025	2025-2026	2026-2027	2027-2028
Angler Access				X
Vegetation				X
Electrofishing – Fall[1]				
Report				X

[1]Electrofishing will be conducted opportunistically when water level is adequate.

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