

Box Butte Reservoir

2023 Survey Summary

prepared by
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Box Butte Reservoir is located approximately 9 miles north of Hemingford, south of the Pine Ridge escarpment, in the Nebraska panhandle. The reservoir was constructed in the early 1940's and impounds the Niobrara River which originates about 60 miles upstream. Box Butte Reservoir was designed for irrigation, flood control, and recreation.

Box Butte Reservoir is owned by the Bureau of Reclamation (BOR) and encompasses 2,212 acres while the reservoir itself impounds approximately 1,600 of those acres at conservation pool (Elevation 4007ft). A State Recreation Area (SRA) encompasses the northeast end of the reservoir while the rest of the property is managed as a Wildlife Management Area (WMA). These areas are all managed by the Nebraska Game and Parks Commission. The SRA offers electrical and primitive camping, shower house, dump station, water, boat ramp, fish cleaning station, swimming, picnic tables and shelters, and primitive restrooms.

Game fish species present in Box Butte Reservoir include: walleye, northern pike, channel catfish, yellow perch, bluegill, black crappie, rock bass, largemouth bass, smallmouth bass, and pumpkinseed sunfish. Rainbow trout and blue catfish have both been stocked in years past, and are possible to exist in the lake, but none have been collected in recent surveys or reported by anglers. One flathead catfish was collected in 2013 during a fall survey although they have never been stocked in the reservoir before. It is an excellent open water fishery for all game fish species as well as a top ice fishing destination for pike, bluegill, and yellow perch. Box Butte is also known for its water clarity, making it desirable for bow fishing, underwater powered spear gunning, and surface spear action.

A fall gillnet survey was conducted on October 10th and 11th, 2023 to evaluate the walleye and channel catfish populations. Gillnets are not the preferred sampling technique for yellow perch, northern pike, or crappie but can indicate some size structure to those population if they are captured in the survey. Since walleye don't recruit to gillnet sampling techniques till age-1, a nighttime electrofishing survey was conducted on September 5th, 2023 to evaluate year-class potential and stocking success. No spring frame net surveys were conducted on Box Butte in 2023 due to intensive sampling efforts in the Sandhills to evaluate winterkill impacts to sandhill lakes. Surveys are conducted each year at approximately the same locations and dates as previous years to allow for trend comparisons. The following figures and narratives describe those trends from the surveys in 2023 and years past.

Visitors to Box Butte will notice expanded camping opportunities in 2024 as the new electrical campground was completed in the fall of 2023. The campground includes 20 new sites along with a dump station and shower house. Half of the new sites will be available for reservation at <https://nebraskastateparks.reserveamerica.com>. The other half of the campsites are available at a first come first serve basis.

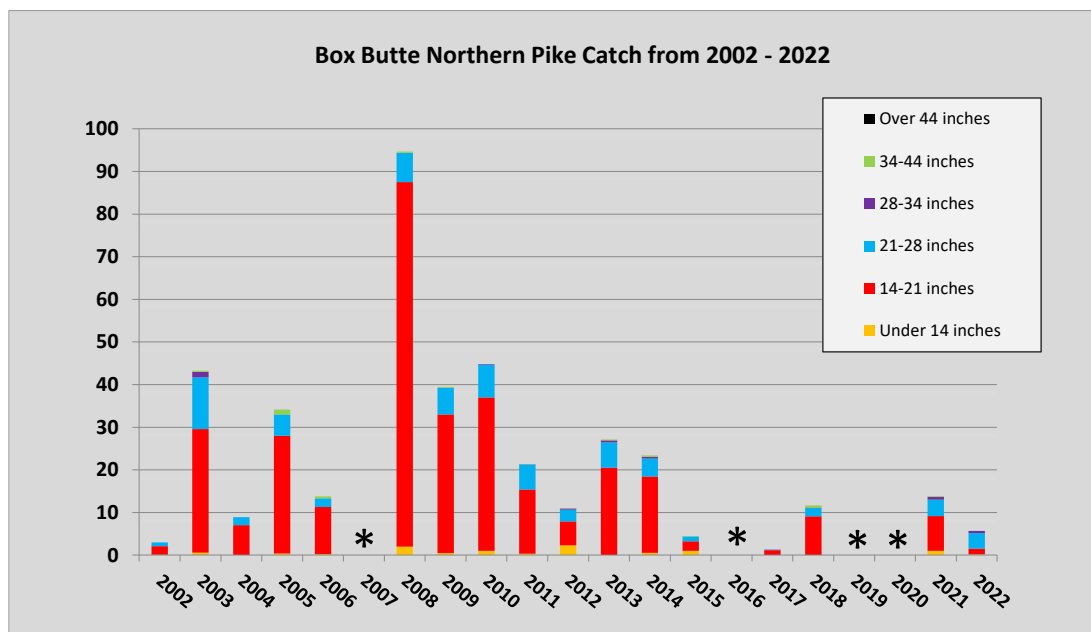


Northern Pike

Northern pike sampling at Box Butte Reservoir is conducted in mid to late March or when the ice comes off, whichever comes first. The sampling gear consists of frame nets that are set perpendicular to the shoreline to intercept pike as they move into vegetated spawning areas. Box Butte northern pike population was not sampled in 2023. The last survey completed occurred in 2022 as indicated in the graph below. Eight pike were collected in the 2023 fall gillnet survey. Half the catch was over 28 inches with the largest fish measuring 33.5 inches.



The pike population catch has indicated a declining abundance since the peak catch rates in 2008. The population is also seeing higher numbers of big pike as suggested by the gillnet catch in 2023 and angler reports.



The northern pike regulation in 2008 was changed to include a 10 fish daily bag limit with a protected slot. Anglers were required to release any pike between 28 and 34 inches and only one pike over 34 inches was allowed in the daily bag. This regulation appeared to be reducing the pike abundance, but few pike were growing into the 28 inch protected slot. A new regulation was set in 2019 that maintained the 10 fish daily bag limit but only 3 pike could be longer than 22 inches and only one of those pike could be over 34 inches. This regulation concentrates the extra harvest on smaller, slower growing males, and reduces harvest on the larger, faster growing females. Although the size structure of pike in Box Butte appears to be improving, this regulation will continue to be monitored for the next several years.

Popular methods to catch pike include casting or trolling lures such as spinnerbaits, spoons, jigs with plastics, or crankbaits. Live bait is also very effective. Past creel surveys indicate that the best months to target pike are May and June and late into the fall.

Panfish

The panfish populations were not sampled in 2023. Panfish surveys typically occur in April for yellow perch and May for bluegill and crappie. Both spring frame nets and fall gillnets do indicate some of the size structure of panfish even if the abundance does not represent the populations.

Bluegill are doing very well in Box Butte with anglers reporting exceptional catch rates of 8 to 9 inch fish in 2023.

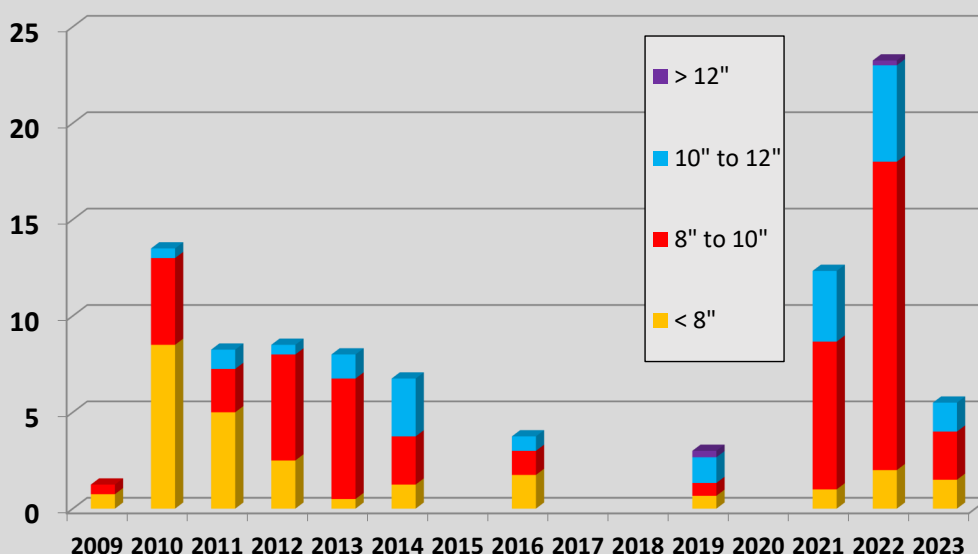
Black crappie have been rare in frame net surveys but are becoming more common with consistent year-classes. Angler reports suggested a decline in crappie catch in 2023 compared to 2022. A few crappie were collected in the fall gillnet in 2023 with the average fish around 10.5 inches.

Yellow Perch catch per gillnet declined to 5.5 fish per net in 2023. The average size perch collected was 8.6 inches but some fish over 10 inches are present in the fishery. With lower northern pike abundance, and good water levels, yellow perch may continue to do well in the reservoir in the coming years.

The daily bag limit for panfish is 15 fish in combination with a possession limit of 30.



Box Butte Yellow Perch Catch per Gillnet



Channel Catfish

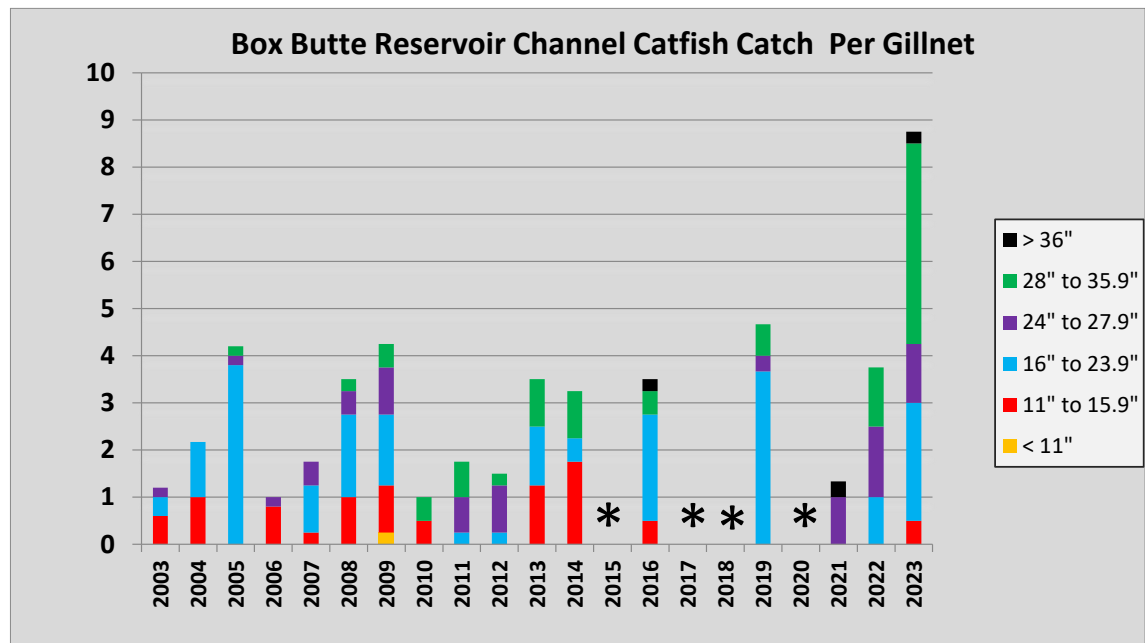
The channel catfish gill-net catch in 2023 was the highest catch in over 20 years at 8.75 fish per net. Although the catch was higher than normal, it is still a low density fishery with the 20 year average of 2.5 fish per gillnet. Low abundance, however, consistently produces a trophy class fishery with channel catfish exceeding 28 inches on a regular basis. The average size catfish sampled in 2023 was 25.4 inches with the biggest one at 37.4 inches and 22.5 pounds. Box Butte remains the top destination for trophy channel catfish in the panhandle of Nebraska.

To maintain this trophy population a new regulation was put into effect in 2021 to allow only one channel catfish over 30 inches in the daily bag limit. This regulation was expanded statewide in 2023. The daily bag limit remains at 5 channel catfish with a possession limit of 20.



Box Butte receives an annual stocking of 4800 channel catfish that are approximately 9-10 inches in length. This is a stocking rate of 3 fish per acre.

Anglers should also know that blue catfish were stocked in Box Butte in 2007 and again in 2008 to add species diversity and create a potential trophy fishery. Although only one blue catfish was sampled in 2008 and none since then, it is possible for them to show up in the fishery. It is the anglers responsibility to be able to differentiate species as channel catfish have a bag limit of 5 fish per day and blue catfish are managed as a trophy fish statewide with a bag limit of 1.



Blue or Channel?

1. Blue catfish have a long straight anal fin while a channel catfish's anal fin is rounded.
2. Small channel catfish will have spots across its body while blue catfish will not.

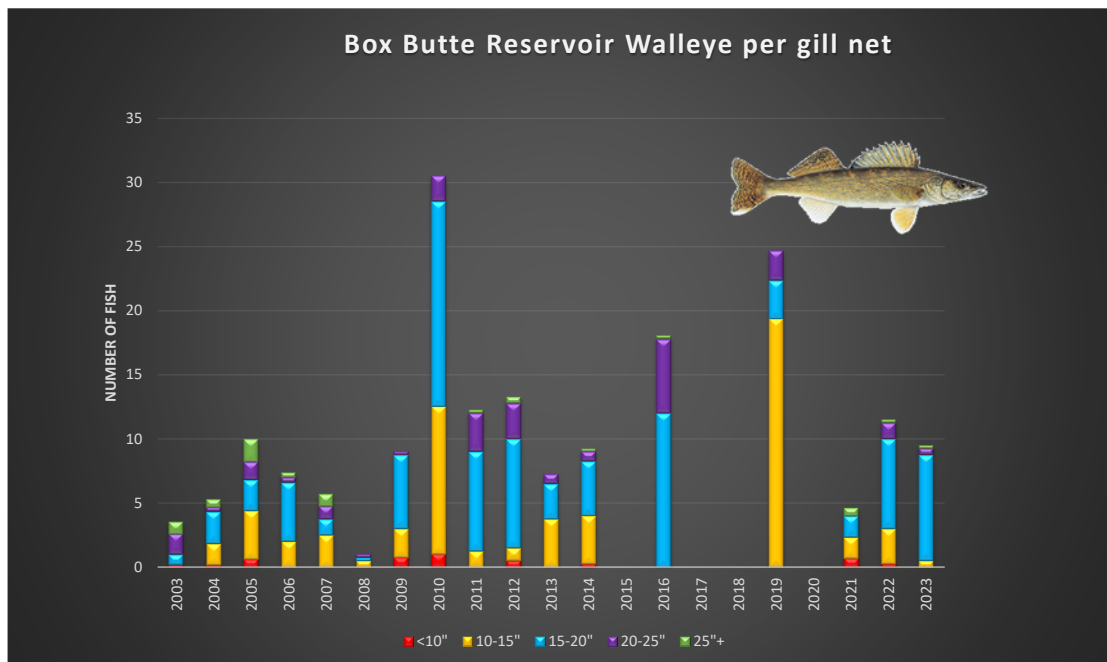
Walleye

Walleye numbers in 2023 declined slightly from the 2022 catch to 9.5 walleye per gillnet. Of those fish that were sampled, 94% of them were above the statewide minimum length requirement of 15 inches. The average size of walleye collected during the survey was approximately 17 inches and the largest fish surveyed was 26 inches. The 2019 year-class made up a bulk of the population. However, fish up to 8 years old were collected in the survey.

Box Butte Reservoir is one of the few waterbodies that consistently produces natural walleye recruitment, but in 2018 while the reservoir was held low for repairs on the dam, walleye fingerlings were stocked. The 2018 year-class was very successful and walleye fingerlings have continued to be stocked annually since. Stocking contribution was evaluated in 2023 to see if the walleye recruitment is a result of stocking or good natural recruitment to the population. The 2023 stocking of fingerling were marked with Oxytetracycline (OTC). OTC imprints a mark on the otolith that can be identified under a special filter to see if the collected fish was from natural recruitment (not marked) or a stocked fish (OTC mark identified). Fall electrofishing collected 111 young-of-the-year walleye per hour of effort of which 50 were evaluated for OTC marks. The 2023 fingerling stocking contributed to 56% of the catch. Although the stocking did contribute to the walleye population, natural recruitment is still playing an important part to the walleye fishery. Stock contribution will continue to be evaluated at Box Butte in 2024.



Anglers are reminded that they are allowed a daily bag limit of 4 walleye that must be greater than 15 inches and only one walleye over 22 inches may be included in the daily bag.



Bass

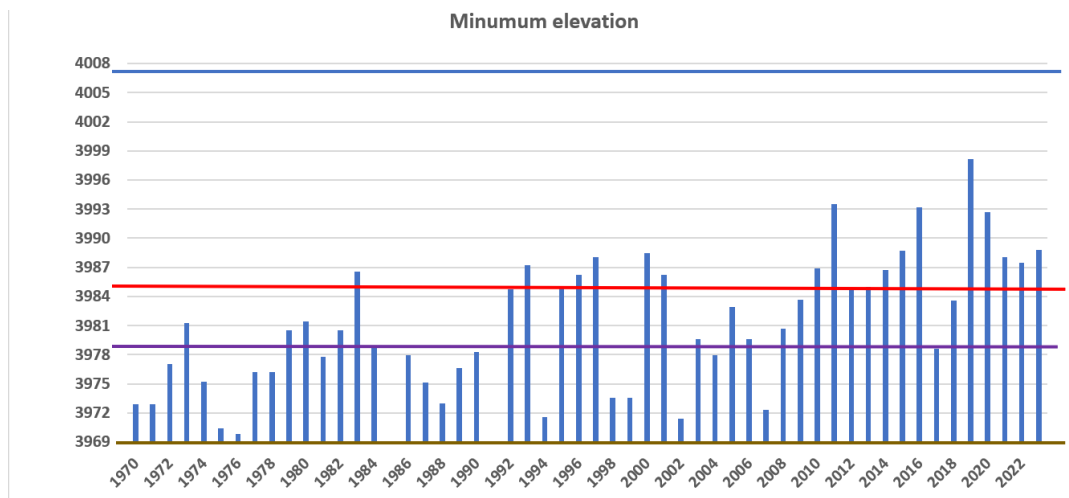
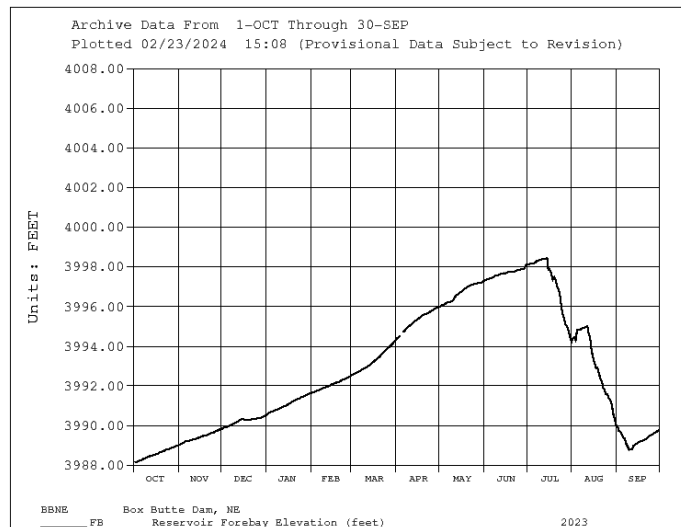
Bass populations were not surveyed in Box Butte in 2023. However, the reservoir consistently produces some quality bass fishing. Both smallmouth and largemouth can be found in Box Butte with some big fish reported by anglers.



Water Operations

Box Butte water levels topped out at elevation 3998.45 feet and a storage of 17,181 acre-feet in 2023. Irrigation used 9,409 acre-feet of water leaving the lake in pretty good shape for the season. The old agreement with Mirage Flats Irrigation District to not draw the lake below elevation 3979 (purple line) feet expired in 2020 and no new agreement has been reached yet. The irrigation district has been able to leave more water in the reservoir with good water years than previous years. The boat ramp is functionable down to elevation 3985 feet (red line).

Maintaining higher water levels in the reservoir increases productivity and the results are showing up with the exceptional fishery. Negotiations will continue in 2024 to try and sign a new agreement to not draw the reservoir below elevation 3985 feet to maintain that high productivity and boat access.



Invasive Species

Over the past several years invasive species have become a rising concern in Nebraska. It is illegal to either arrive or leave any water body in Nebraska with water other than from a domestic source (water supply system, well or bottled) except for firefighting purposes.

Zebra mussels and quagga mussels are small fingernail-sized mussels and adults are usually $\frac{1}{4}$ to $\frac{1}{2}$ inches long with alternating yellow and brownish colored stripes on their shell. These mussels can spread in their immature form known as veligers by being transported in bilge, ballast, or live-well water or as adults attached to boat hulls, engines, aquatic vegetation, or other surfaces. Although no invasive mussels have been documented yet at Box Butte Reservoir, sampling for these veligers occurs throughout the summer when water temps are above 50 °F. With the growing number of lakes in South Dakota infested with zebra mussels and the presence of them in Lewis and Clark, Lake Yankton, and throughout the Missouri River system, it is important to practice **CLEAN, DRAIN, and DRY** to prevent the spread to other Nebraska waters.

Box Butte Reservoir is not fortunate enough to be free from aquatic invasive species. Curly-leaf Pondweed and Eurasian Watermilfoil are two invasive plants present in the Reservoir. Both of these plant species form dense mats of vegetation near the water's surface which make recreational fishing, boating, and swimming difficult. Spread of these plants can happen through stem fragmentation where a single segment of plant material can be transferred to another water body and form a new colony. Removing any visible plant material from boats and trailers is a must and remember to **CLEAN, DRAIN, and DRY!**



Curly-leaf Pondweed from
Box Butte Reservoir

Anglers may encounter Nebraska Game and Parks staff conducting boat inspections and interviews to monitor risk of invasive species and help prevent the spread to and from Box Butte Reservoir in 2024.

CLEAN- Remove plants, animals, mud and thoroughly wash equipment that came into contact with the water.

DRAIN- Drain all water before leaving, including livewells, bilge, ballast, and any parts or equipment that can hold water. Remember to remove all boat plugs before leaving the boat launch area and don't put them back in until ready to launch again.

DRY- Allow all equipment to dry completely before launching into another body of water. Don't fish more than one body of water in a day without drying all equipment first.

For more information on invasive species in Nebraska visit neinvasives.com.

Don't forget to lower your outboard motor to drain all the water from your lower unit before leaving a boat launch facility.

For additional information about fisheries management at Box Butte Reservoir please contact the following personnel by phone or email addresses listed below.

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