

# Box Butte Reservoir

## 2024 Survey Summary

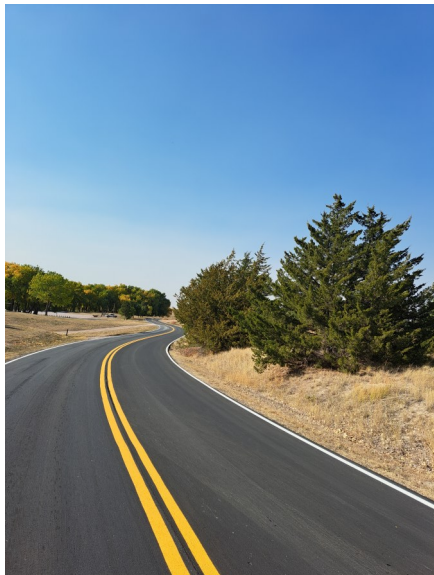
prepared by  
Joe Rydell Fisheries Biologist

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.

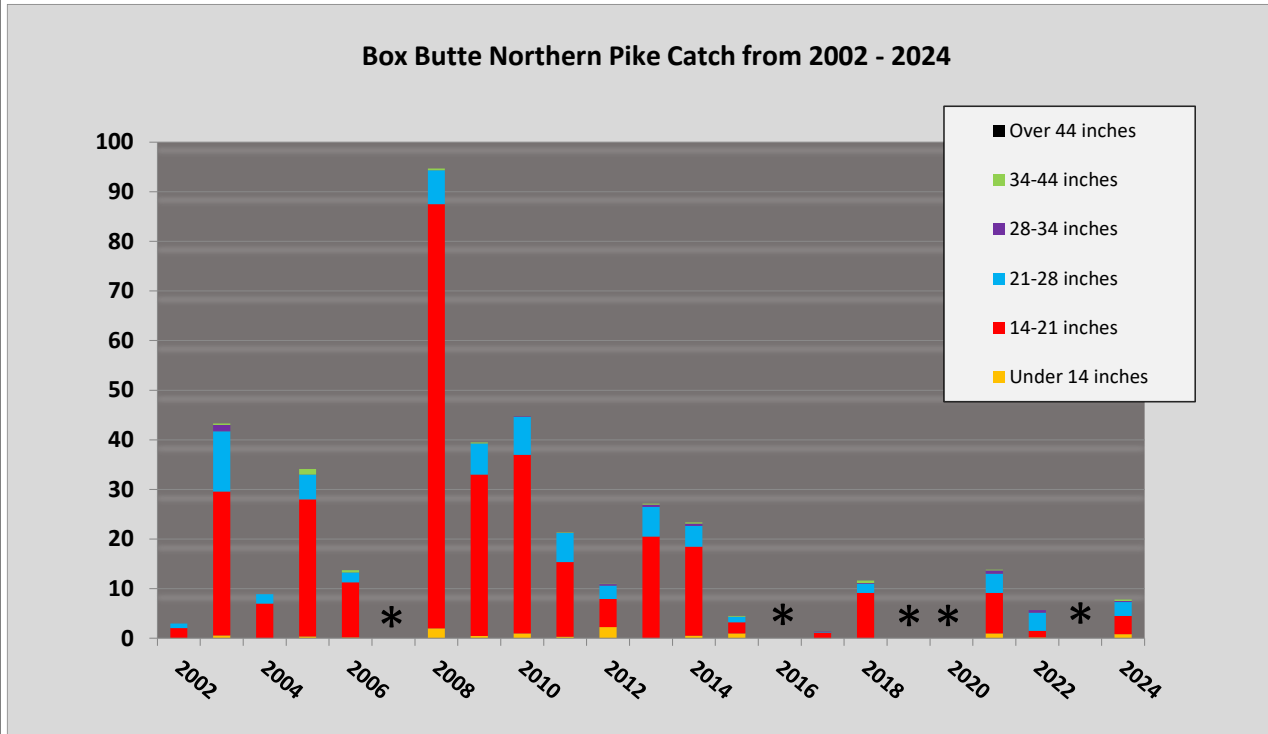
Game fish species present in Box Butte Reservoir include: walleye, northern pike, channel catfish, yellow perch, bluegill, black crappie, rock bass, largemouth bass, smallmouth bass, and pumpkinseed sunfish. Rainbow trout and blue catfish have both been stocked in years past, and are possible to exist 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.

In 2024, a frame net survey was conducted on March 12th to sample the northern pike population and a gillnet survey was conducted on October 9th and 10th targeting walleye and channel catfish populations. An early spring frame net survey and fall gillnets are not the preferred sampling techniques for yellow perch, bluegill, or crappie but can indicate some size structure of those population if they are captured in the survey. These species are typically surveyed later in the spring when they are moving shallow to spawn. Since walleye don't recruit to gillnet sampling techniques till age-1, a nighttime electrofishing survey was conducted on September 18th, 2024 to evaluate year-class potential and stocking success for walleye. 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 2024 and years past.



Visitors to Box Butte Reservoir will be greeted with a new entrance road through the State Recreation Area. This \$350,000 project was completed in the late fall of 2024.

# 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. A total of 47 pike were collected in 2024 with a catch rate of 7.8 fish per frame net. Pike abundance remains low compared to the high numbers sampled in the early 2000's. Although abundance is lower, larger fish are showing up in the population. The largest pike sampled in 2024 was just over 37 inches with fish over 40 inches being reported by anglers.

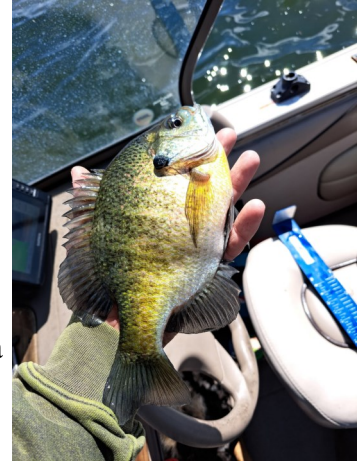
Anglers are allowed 10 pike in their daily bag limit but only 3 pike may be longer than 22 inches and only one of those pike can be over 34 inches. This regulation concentrates the extra harvest on smaller, slower growing males, and reduces harvest on the larger, faster growing females. Although the size structure of pike in Box Butte appears to be improving, this regulation will continue to be monitored for the next several years.



# Panfish

The panfish populations were not sampled in 2024. Panfish surveys typically occur in April for yellow perch and May for bluegill and crappie. Both early spring frame nets and fall gillnets do indicate some of the size structure of panfish even if the abundance does not represent the populations.

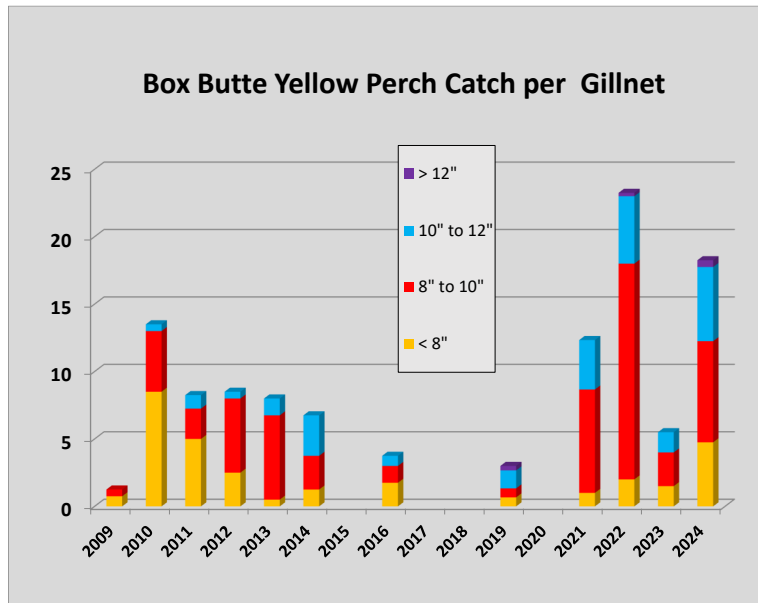
Bluegill are doing very well in Box Butte with anglers reporting exceptional catch rates of 8 to 9 inch fish in 2024. Although only a few were collected during the spring pike survey, most were in that size range.



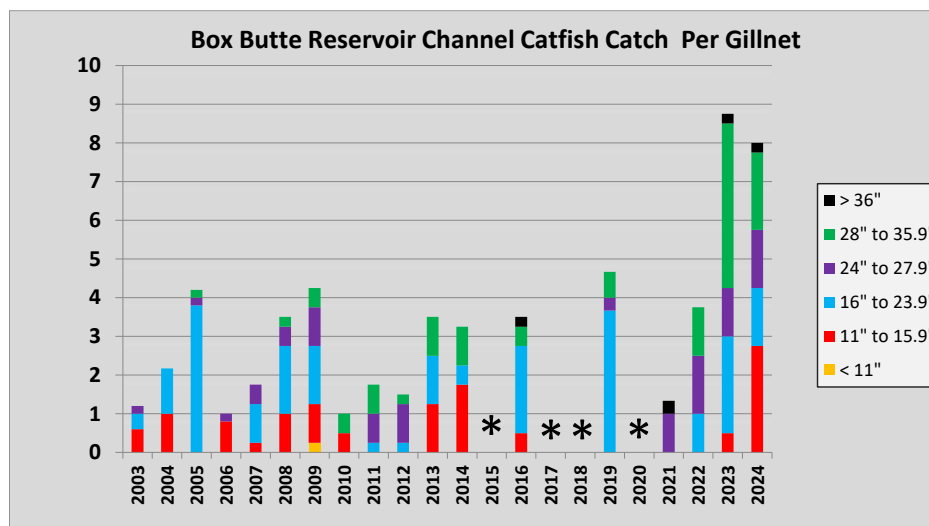
Black crappie have been rare in frame net surveys but are becoming more common with consistent year-classes. Angler reports suggested a decline in crappie catch in 2024 compared to the previous couple years. A few crappie were collected in the fall gillnet in 2024 with the average fish around 11.3 inches.

Yellow perch are doing very well in Box Butte Reservoir. The gillnet catch was 18.25 perch per net in 2024 with over 30% of the catch over 10 inches. Age and growth analysis from the 2023 survey suggested consistent recruitment with most perch under 4 years old. No age and growth was conducted in 2024. This boom in perch is likely contributed to a combination of good water levels in the reservoir over the past few years and reduced pike abundance. Anglers should continue to see good perch fishing in the coming years.

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



# Channel Catfish



The channel catfish gill-net catch in 2024 was similar to that in 2023. Channel catfish abundance was 8 fish per gillnet with all size categories representative. Although the catch appears 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 2024 was 22 inches with the biggest one at 36.3 inches and 23.6 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 4,800 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.



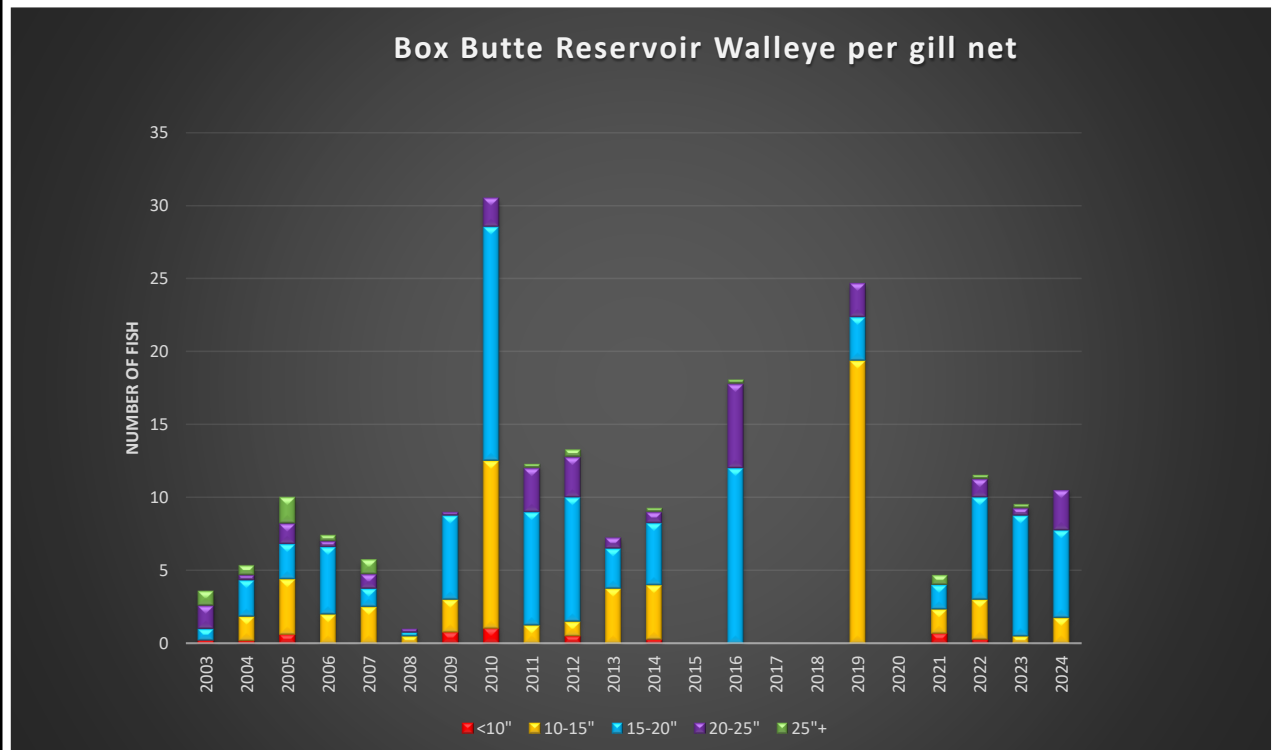
# Walleye

Walleye abundance in Box Butte has been stable for the last 3 years. The 2024 gillnet catch was 10.5 walleye per gillnet. Of those fish that were sampled, 83% of them were above the statewide minimum length requirement of 15 inches. The average size of walleye collected during the 2024 survey was approximately 17.9 inches and the largest fish surveyed was 23 inches.

Box Butte Reservoir is one of the few Nebraska 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 2024 to see if the walleye recruitment is a result of stocking or good natural recruitment to the population. Fingerling walleye were marked with Oxytetracycline (OTC) prior to stocking. 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 catch was much lower in 2024 compared to 2023 at 5.1 young-of-the-year walleye per hour of effort and only 34 walleye were evaluated for OTC marks compared to 50 in 2023. The 2024 fingerling stocking contributed to 82.3% of the catch which was significantly higher than 2023 (56%). Although the stocking did contribute more to the walleye population in 2024, natural recruitment is still playing an important part to the walleye fishery. Stock contribution will continue to be monitored in 2025.



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.



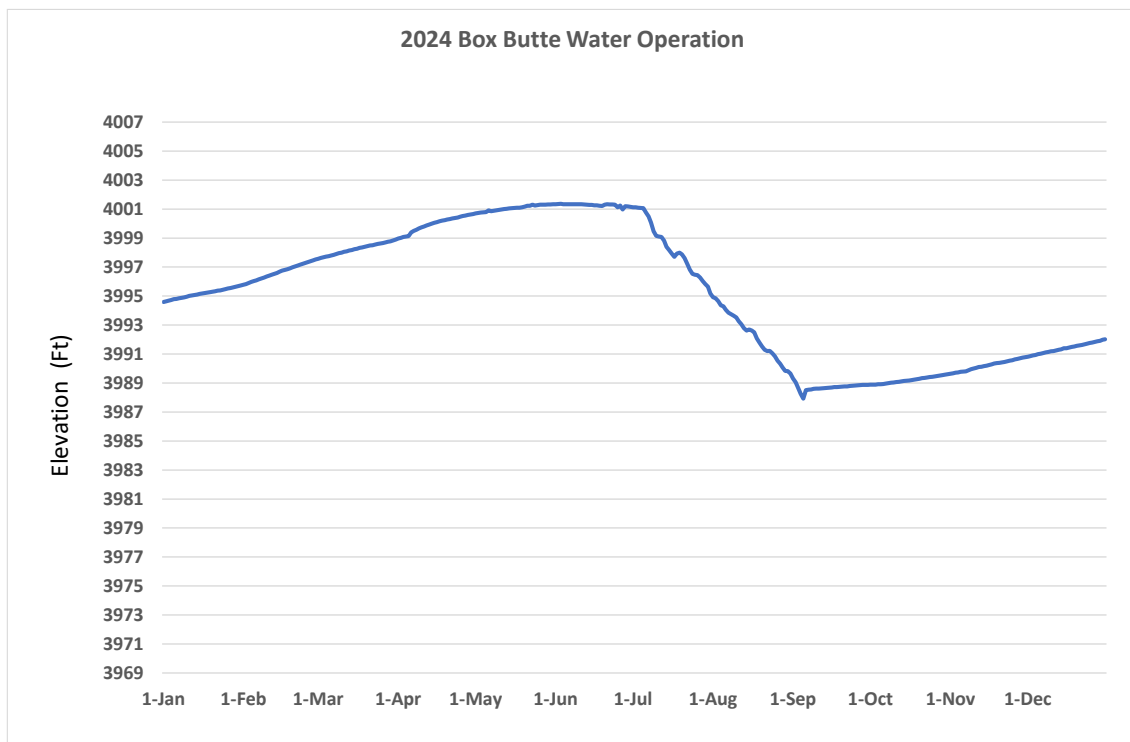
# Bass

Bass populations were not surveyed in Box Butte in 2024. 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 filled to elevation 4,001.36 ft and a storage of 20,905 acre-feet in 2024. Irrigator use was higher than normal due to dry conditions and they were able to utilize 13,736 acre-feet of water. This still left the lake in pretty good shape for the season ending the year with 7,169 acre-feet of water in the reservoir at elevation 3,987.92 ft. Since 2010 Box Butte has filled above elevation 4,000 ft ten times allowing more water left in the lake during those high water years. More water in the lake, results in higher productivity and the fishery has responded with good recruitment and growth rates for most species.



## Fish Stockings



Most species in Box Butte Reservoir maintain their populations from natural recruitment and don't require additional stocking. As mentioned above, walleye stockings began in 2018 and will continue in 2025. The annual request for walleye is 60,000 fingerling but some extra walleye were added to the stocking in 2024. The 2025 walleye fingerlings will also be marked with OTC to evaluate the stocking success.

Channel catfish also get stocked on an annual basis at a low density to maintain their population.

A small stocking of rock bass were stocked in 2024. These were extra fish that were produced in a state hatchery after meeting the stocking request for the state. Since Box Butte Reservoir has a low population of rock bass, this was a way to utilize those fish.

Another species that doesn't get stocked as regular that is planned for 2025 is smallmouth bass. Smallmouth bass are a popular species that do well in Box Butte Reservoir but recruitment is typically low. The proposed stocking is to supplement the population and increase smallmouth abundance.

| Species         | Number Stocked 2024 | Proposed Stocking 2025 | Size |
|-----------------|---------------------|------------------------|------|
| Walleye         | 92,600              | 60,000                 | 2"   |
| Channel catfish | 4,800               | 4,800                  | 10"  |
| Rock Bass       | 1,044               |                        | 1"   |
| Smallmouth Bass |                     | 30,000                 | 2"   |



## 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. In 2024 a third invasive species was identified in Box Butte. Brittle Naiad was documented throughout the reservoir during vegetation sampling in 2024. All three 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 2025.**

**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](http://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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