

2018 Fisheries Survey Summary

Irrigation Reservoirs in the Nebraska Panhandle



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Several reservoirs located in the panhandle of Nebraska were built and managed for the primary purpose of water storage for irrigation. Water levels in these reservoirs can change drastically throughout a year and may make access difficult or impossible. The Bureau of Reclamation owns Box Butte Reservoir, Lake Minatare, Lake Winters Creek, and Big Lake Alice. Water levels in these reservoirs are controlled by their associated irrigation district. Whitney Reservoir is owned and managed by the Whitney Irrigation District. Oliver Reservoir was constructed by the Kimball Irrigation District, but is currently owned and managed by the South Platte Natural Resource District as a Recreation Area. Nebraska Game and Parks Commission Fisheries Management Section manages the fish populations. A map of lake locations can be found at <https://maps.outdoornebraska.gov/fishing/>.

This report will provide survey results for each reservoir for the targeted species. Not all species are sampled in every reservoir annually. Different sampling techniques are used throughout the year to collect targeted species. These techniques are standardized in Nebraska to allow comparisons across waterbodies and identify trends in populations from year to year. Largemouth bass are surveyed at night by electrofishing while shoreline oriented species (bluegill, crappie, yellow perch, and northern pike) are sampled using frame nets. Off-shore species such as white bass, channel catfish, and walleye get sampled by gillnets in the fall. Species collected during a survey are counted, measured, weighed, and some scales removed for aging before releasing them back. Biologists use this information to monitor the health and size structures of each fish population. Anglers are reminded they should not rely solely on what the surveys indicate as patterns of weather and timing of the surveys could have effects on catch rates for certain species. For example yellow perch and northern pike are sampled in late March or early April when they are moving into the shallows to spawn; this can happen relatively quickly even within a few days making sampling of these species in several waterbodies relatively difficult.

The table below lists the fish surveys completed in 2018 and the species that were targeted. Although other species are collected during these surveys and may be mentioned in this report the results should not be compared to other surveys.

Lake	Target Species	Survey Type
Box Butte Reservoir	Northern Pike	Spring Frame Net
Box Butte Reservoir	Largemouth and Smallmouth Bass	Night Electrofishing
Minatare	Walleye, White Bass, Catfish	Fall Gillnet
Oliver	Walleye, Catfish	Fall Gillnet
Lake Winters Creek	Walleye, Catfish	Fall Gillnet



Fish scales are used to determine age and growth by counting and measuring annuli. Although many structures allow age determination, scale removal is not lethal and allows the fish to return to the water.

Box Butte Reservoir

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, water, boat ramp, fish cleaning station, swimming, picnic tables and shelters, and primitive restrooms.

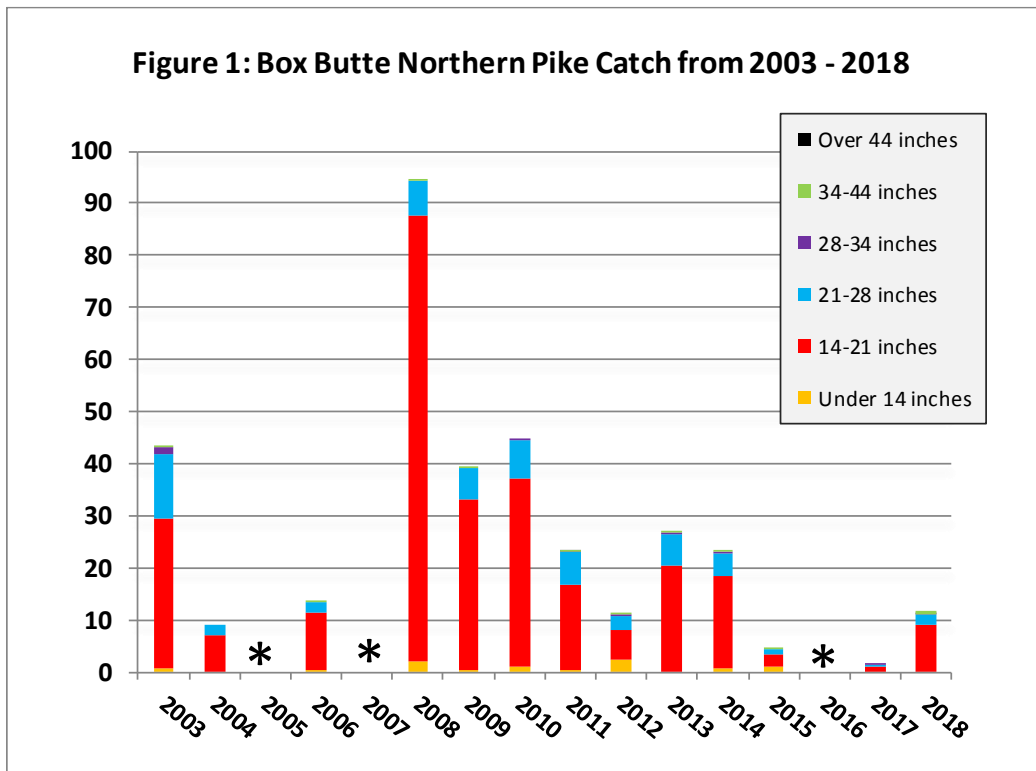
Game fish species present in Box Butte Reservoir include: walleye, northern pike, channel catfish, blue catfish, yellow perch, bluegill, black crappie, rock bass, largemouth bass, smallmouth bass, and pumpkinseed sunfish. It is an excellent open water fishery for all game fish species as well as a top 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.

This past year, the BOR completed a major repair to the toe drain system on the dam. During this project, the reservoir was required to be maintained below elevation 3985 ft. The irrigation district drew the lake down to the minimum agreement (3979 ft) during the fall of 2017 and maintained it most of the year just below 3985 ft. With only six feet of elevation available for irrigation, the irrigation district chose not to irrigate this past season. With the lake maintained at this level, the Nebraska Game and Parks made some improvements to the boat launch facility. A new double lane boat ramp was installed with a new dock and new rock to the parking lot. An overflow parking area was established north of the entrance road to help during busy boating times. While the new ramp was being built a temporary launch site was provided east of the old boat ramp.

A northern pike survey was conducted on Box Butte Reservoir early in the spring of 2018. Although northern pike are also found in Whitney, Minatare, Oliver, and Lake Winters Creek, this was the only irrigation reservoir surveyed for pike in 2018. A total of 11.6 pike were sampled per frame net with an average size of 20 inches. The 10 fish bag limit put in place in 2008 appears to be helping reduce pike numbers but the protected slot limit has not improved the size structure (Figure 1). Northern Pike regulations at Box Butte Reservoir will be changing to allow anglers to keep 10 pike of which only 3 may exceed 22 inches, and only one of those may exceed 34 inches total length. Age and growth analysis suggests that males seldom exceed 22 inches and females that get over the 22 inch mark grow extremely well exceeding 28 inches in 5 years and over 33 inches in 6 years. This new regulation will encourage harvest of those smaller males while limiting the harvest on larger faster growing females.



Box Butte Reservoir (continued)



The low water levels at Box Butte allowed for a good bass survey this year. Fluctuating water levels make bass surveys difficult to perform on irrigation reservoirs as water levels are usually high, flooding terrestrial vegetation and timber during the spring and early summer when bass surveys are typically conducted. Box Butte bass population consists of both smallmouth and largemouth. The largemouth bass catch was at 45 fish per hour of electrofishing effort with an average size of 11.4 inches and only 7 percent of the population was over 15 inches.

Smallmouth in Box Butte appear to be declining. Only 6 smallmouth bass were sampled per hour of electrofishing with an average size of 10.8 inches. Both largemouth and smallmouth were in excellent body condition with relative weight values above 100 for all sizes. With the reservoir down, brush, vegetation, and other habitat to help young-of-the-year fishes hide was absent. The lack of small bass (largemouth < 8 inches and smallmouth < 7 inches) is likely due to high predation and may result in a missing year-class.

Although catfish, walleye, or panfish populations were not surveyed in Box Butte in 2018, fishing for these species can be excellent. Angler reports from 2018 suggested a great year for catching channel catfish over 15 lbs and will likely be a top destination in 2019 for anglers looking for a master angler.

Figure 2. Box Butte LMB Catch Per Hour Electrofishing

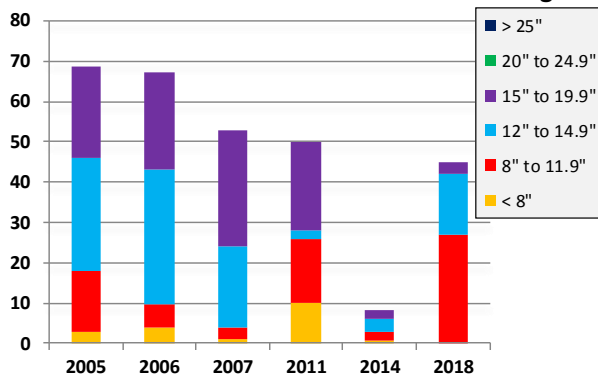
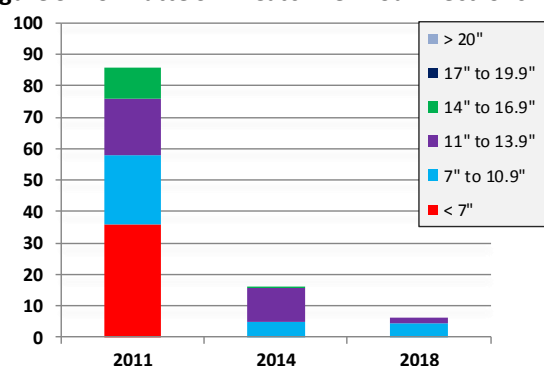


Figure 3. Box Butte SMB Catch Per Hour Electrofishing



Lake Minatare

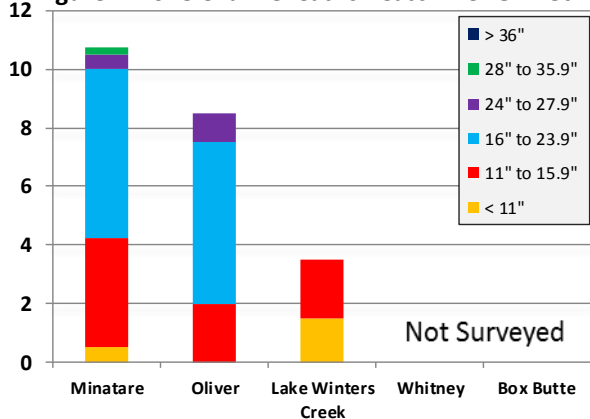
Lake Minatare State Recreation Area is located 6 miles east and 8 miles north of Scottsbluff, NE in the North Platte River Valley. The area encompasses 2,873 acres, including a 2,147 acre reservoir when full. The reservoir was built in 1915 by the U.S. Bureau of Reclamation primarily for irrigation purposes. In 1986, jurisdiction of the area was granted to the U.S. Fish and Wildlife Service as part of the North Platte Wildlife Refuge. The lake and land adjacent to the reservoir is managed by the Nebraska Game and Parks Commission through a lease agreement for recreational activities while the Pathfinder Irrigation District controls water levels for irrigation.



Fishing is available at Lake Minatare for a variety of fish species which include walleye, northern pike, white bass, wiper, channel catfish, blue catfish, smallmouth bass, largemouth bass, and yellow perch.

A fall gillnet survey was conducted in 2018 to evaluate the catfish, white bass, and walleye populations. Although both blue and channel catfish are present in Lake Minatare, only channel catfish were collected in 2018 at a rate of 10.75 fish per gillnet (Figure 4). The average size channel cat was 17.3 inches but ranged from 12.4 inches up to 28.2 inches. White bass abundance was low in 2018 at less than 1 per gillnet. White bass typically travel in schools and can be difficult to sample. Although the catch rate was low, one individual was over 15 inches suggesting the potential for a quality fish.

Figure 4. 2018 Channel Catfish Catch Per Gillnet

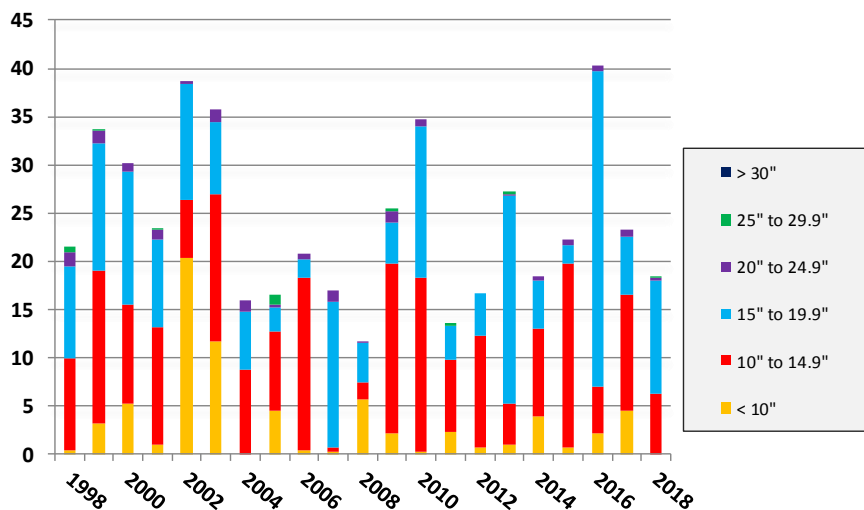


No wipers were collected in 2018, but a few likely still persist in the fishery. Wiper stockings were discontinued in 2011 to try and improve the white bass population.

Lake Minatare was down to 18.5 walleye per net from last year's catch of 23.25. Even with a good harvest in 2018 some of the big year-class still survived offering some better than usual fish in Lake Minatare.

A year-class of 4 year-old fish are persisting and averaging 19.4 inches. Although the abundance is down, anglers should still find good numbers of keeper size walleye as 66 percent of the catch was over the 15 inch minimum length limit.

Figure 5. Lake Minatare Walleye Gillnet Catch



Big Lake Alice and Lake Winters Creek

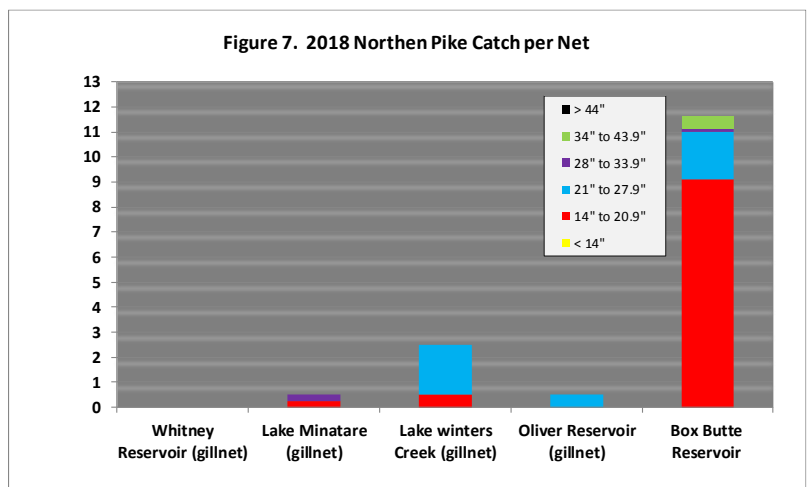
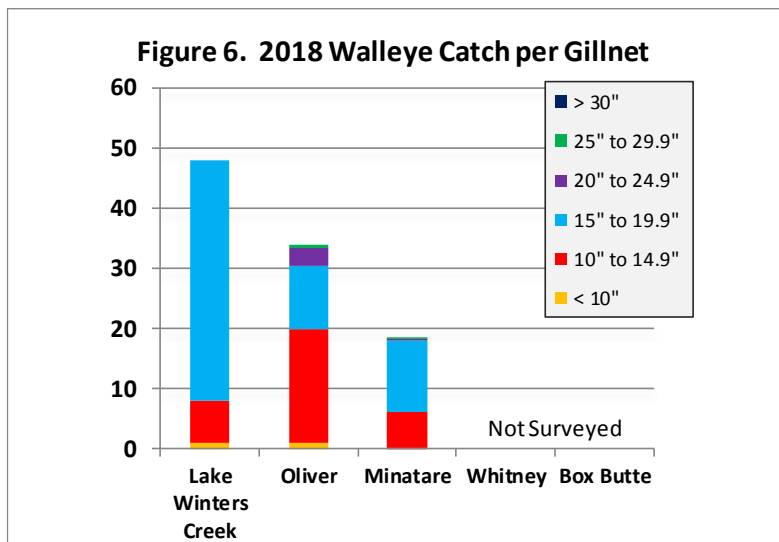
Big Lake Alice and Lake Winters Creek are both part of the North Platte Wildlife Refuge located above Lake Minatare and supplied by water from the Lake Minatare supply canal. Due to irrigation, Big Lake Alice is lowered to an elevation every year which results in very few fish surviving the winter months. Therefore Big Lake Alice is utilized as a rearing lake for shad, walleye, and perch to be sent down the supply canal and into Lake Minatare. These species typically exhibit better growth in Big Lake Alice due to the “new lake affect” each year. When water is transferred during the fall, some of these get drained into Lake Minatare providing some advanced fish that have a better chance of surviving the winter.

As part of the North Platte National Wildlife Refuge, Lake Winters Creek has a few special fishing regulations. The lake is only open during daylight hours and anglers are restricted to non-gas motors. Anglers may find a variety of species at Lake Winters Creek including yellow perch, black crappie, bluegill, walleye, largemouth bass, and northern pike. To provide a refuge for migrating waterfowl, Lake Minatare, Lake Winters Creek, and Big Lake Alice are closed to public use from October 15th through January 14th each year.

Lake Winters Creek was sampled in the fall of 2018 using gillnets to evaluate the walleye and channel catfish populations. With a walleye catch of 48 fish per net, Lake Winters Creek will be the top walleye destination in the panhandle in 2019. The average size walleye was 16.2 inches with 83 percent of the population over the minimum length of 15 inches (Figure 6).

Lake Winters Creek channel catfish sample was low with a catch rate of 3.5 fish per net (Figure 4). It is likely this sample is underestimating the true population as the nets were saturated with a high walleye catch. The average size catfish collected was 11.5 inches but ranged from 11.4 to 15.2 inches. Angler reports suggest that larger catfish are present in Lake Winters Creek.

Although northern pike were not surveyed in Lake Winters Creek, it is a popular destination for pike fisherman around the Scottsbluff area. The fall gillnet survey collected a few pike that averaged 21.9 inches (Figure 7). Northern pike are an aggressive predator fish that provide excellent fishing action for both bank and boat anglers. Although they require a little more care cleaning, they are also excellent table fare. The statewide northern pike daily bag limit is changing in 2019 to allow 3 fish with only one exceeding 34 inches.



Oliver Reservoir

Oliver reservoir (Kimball Reservoir) is located 8 miles west of Kimball, Nebraska off highway 30. It is a 270-acre reservoir when full, located on a 917-acre recreation area. Currently the lake is less than 100 acres with a maximum depth of 12 feet. South Platte NRD owns and manages the area with the help from Nebraska Game and Parks to sustain a fishery. The combination of drought and over appropriation of groundwater use has contributed to the loss of water inflows to the lake. Occasional strong storms produce flash flood events that has extended the life of Oliver Reservoir. If the water levels in Oliver Reservoir continue to drop, the reservoir may disappear over time. Game fish in Oliver Reservoir include walleye, white crappie, bluegill, largemouth bass, yellow perch, channel catfish, northern pike, and muskellunge.

Oliver Reservoir was surveyed in the fall of 2018 targeting walleye and channel catfish. Even with the low water levels, walleye appear to be doing well. Walleye numbers were great in Oliver with a catch of 34 fish per gillnet (Figure 6). Age and growth analysis suggests consistent year-classes with a good size structure to the population. The average size walleye surveyed was 14.6 inches but fish over 20 inches were sampled.

Catfish abundance was lower in 2018 compared to 2017 (28.5 fish per net) at 8.5 fish per net (Figure 4). However, some good harvestable size fish still persist as 76 percent of the catfish surveyed were over 16 inches.

Although northern pike are found in most of the irrigation reservoirs, Oliver is the only one with a history of a muskellunge fishery. Oliver Reservoir was stocked with tiger muskie from 1986 until 2003. In 2004 the stocking was switched to pure strain muskie which continued for a couple years with the final stocking in 2006. Even after 11 years and periods of extremely low water a few muskie still persist in Oliver. Although no muskie were collected in 2018, in 2016, one muskie was collected during the spring crappie survey and three more were found during the fall gillnet survey. These fish ranged from 30 to 43 inches. The ages of these muskie (determined by looking at scales) ranged from 12 years old down to only 3 years old suggesting some natural recruitment going on.

Crappie were not surveyed in Oliver in 2018 but the reservoir typically has some quality white crappie fishing. May is a good time to target crappie as they move shallow to spawn. In the turbid waters, anglers should fish live bait, or baits and lures that give a flash or vibration.



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.

Whitney Reservoir

Whitney Reservoir is a 900-acre lake located about 1 mile west of Whitney, Nebraska owned and operated by the Whitney Irrigation District. A Wildlife Management Area located on the NE corner of the lake provides angler access with a new boat ramp and a pit toilet. The lake has a drastic summer drawdown making access nearly impossible by late summer. Game fish species present in Whitney Reservoir include: yellow perch, bluegill, black crappie, white crappie, northern pike, largemouth bass, channel catfish, white bass, and walleye.

Whitney was not surveyed in 2018. Angler reports suggest that 2018 was a good year for walleye fishing. The spring bite was fair and anglers fishing into the fall still found good numbers of keeper walleye.

2018 Fish Stockings

Several species within the irrigation reservoirs have self sustaining populations such as bass, bluegill, northern pike, white bass, crappie, and yellow perch. Walleye do get some natural recruitment in irrigation reservoirs, however, the natural recruitment in most irrigation reservoirs is not good enough to keep up with fishing pressure or to maintain consistent year-classes. Channel catfish are also stocked annually in irrigation reservoirs. Catfish are highly preyed upon by predator species at small sizes. By stocking advanced size fish (10 inch plus) survival to catchable size is improved. With the low water levels in Box Butte Reservoir, additional yellow perch were stocked to help maintain a year-class as spawning habitat was limited. The following table is a list of fish stocked in the panhandle irrigation reservoirs in 2018.

Lake	Species	Size	Number
Box Butte Reservoir	Walleye	Fingerling (1.5 inch)	45,150
Box Butte Reservoir	Channel Catfish	10.5 inches	1,000
Box Butte Reservoir	Yellow Perch	3 inches	23,473
Lake Minatare	Walleye	Fingerling (1.5 inch)	110,680
Lake Minatare	Walleye	Fry	2,000,000
Lake Minatare	Channel Catfish	10.5 inches	6,000
Lake Winters Creek	Walleye	Fingerling (1.5 inch)	12,000
Lake Winters Creek	Channel Catfish	10.5 inches	1,200
Oliver Reservoir	Walleye	Fingerling (1.5 inch)	12,000
Whitney Reservoir	Saugeye	Fry	1,062,000
Whitney Reservoir	Channel Catfish	10.5 inch	2,000

Invasive Species

Over the past several years invasive species have become a rising concern in Nebraska. In 2015, a new regulation was established to help prevent the spread of invasive species via boats and trailers. The new regulation states: 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 (pictured right) were first documented in Nebraska in 2006 at Offutt Airforce Base Lake and have since been discovered at Zorinsky Lake (2010) (mussels eliminated via a winter drawdown that froze them out but has had a positive veliger sample since leaving it a suspect lake), Lewis and Clark Lake (2015), Lake Yankton (2017), Glen Cunningham Lake (2018) and below Gavins Point Dam in the Missouri River. Carter Lake is also a suspect lake where veligers were sampled. 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. Sampling for these veligers occurs statewide from the months of May through September. No evidence of these mussels has been discovered in any other lakes sampled.

Aquatic vegetation such as curly-leaf pondweed and Eurasian water milfoil are also invasive species present in Nebraska. Both of these plants 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. A single segment of plant material can be transferred to another water body and form a new colony therefore removing any visible plant material from boats and trailers is a must and remember to **CLEAN, DRAIN, and DRY!**

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

DRAIN- Drain all water before leaving, including wells, bilge, ballast, and any parts or equipment that can hold water.

DRY- Allow all equipment to dry completely before launching into another body of water. For more information on invasive species in Nebraska visit neinvasives.com.

Pictured Left: Photo of curly leaf pond weed at Smith Lake Wildlife Management Area



Attention motorboat owners operating in Nebraska :

Boaters whose motorized watercraft are registered in any state other than Nebraska will be required to display a \$15 Aquatic Invasive Species Stamp each year they boat in Nebraska. This stamp will help fund Aquatic Invasive Species education and inspection programs.



- Note that boat inspections to launch in Nebraska are NOT mandatory at this time.
- This applies to all *motorized* watercraft. Non-motorized craft are exempt.
- Personal watercraft (Jet Ski, Waverunner, Sea Doo, etc.) are required to have this stamp.
- Boats registered in Nebraska pay the fee via their registrations and are exempt from displaying the sticker.

This stamp is available online at www.outdoornebraska.org and at some agency offices.

Learn more about invasive species at www.neinvasives.com.