

## Valentine National Wildlife Refuge Winterkill conditions 2022/2023

During the spring and summer of 2022 the area around Cherry County received about 60% of its normal precipitation so the area as well as much of Nebraska was in some form of drought conditions. This in conjunction with the massive snow storms in December and January caused issues in some of the regions shallow sandhill lakes. Low oxygen readings less than 1.5 parts per million were recorded at many sandhill lakes in the NW district including lakes on the Valentine National Wildlife Refuge. When oxygen levels get this low chances of winterkill at the lakes are high. Drought conditions and thick ice covered with snow prevent sunlight from penetrating the ice and reaching the aquatic plants below. When photosynthesis stops these plants start to decay and die. As the plants decay they tie up oxygen levels by creating hydrogen sulfide which creates toxic conditions for fish. Once the lake drops in oxygen, fish will push towards springs located throughout the lake searching for oxygen levels needed for survival.

Game and Parks personnel across the NW and NE districts of Nebraska made efforts to sample as many waterbodies as possible during the spring and summer months of 2023. This enabled staff to document which lakes had severe, moderate, or little to no winterkill. Many of these lakes have not seen winterkill conditions like this since the 70's and 80's.

During the winter of 2022/2023 when staff started receiving reports of dead fish and documenting low oxygen levels we started to develop a plan to restock these lakes that had severe or moderate winterkill. Stocking of bluegill, yellow perch, largemouth bass and northern pike occurred across many of the lakes on the Valentine National Wildlife Refuge in 2023. Numbers per lake can be seen below. These sandhill lakes are very productive and should rebound quickly providing angling opportunities again in 3-4 years. Surveys completed in 2023 showed that most lakes across the refuge had some winterkill but lakes less severe that have fishable populations include Dewey, Clear, and Rice lakes on the Valentine Refuge. Even though these lakes have fishable populations some species were affected as well from winterkill at these lakes.

Lake	Bluegill	Yellow Perch	Largemouth Bass	Northern Pike
Watts	91,771	57,527	22,689	
Duck	26,680	8,090	6,810	
Rice		11,720		
West Long	39,413	16,954	6,697	
Hackberry	251,587	179,881	31,871	13,862
Dewey				815
Pelican	241,135	200,317	39,380	24,195
<b>Total</b>	<b>650,586</b>	<b>474,489</b>	<b>107,447</b>	<b>38,872</b>

Anglers are encouraged to report dead fish anytime so biologists are made aware and can document these reports and make decisions on management and stocking needs.

Anglers are encouraged to call ahead of time if planning a trip out west to one of our lakes and we will share any information we may have for that particular waterbody.

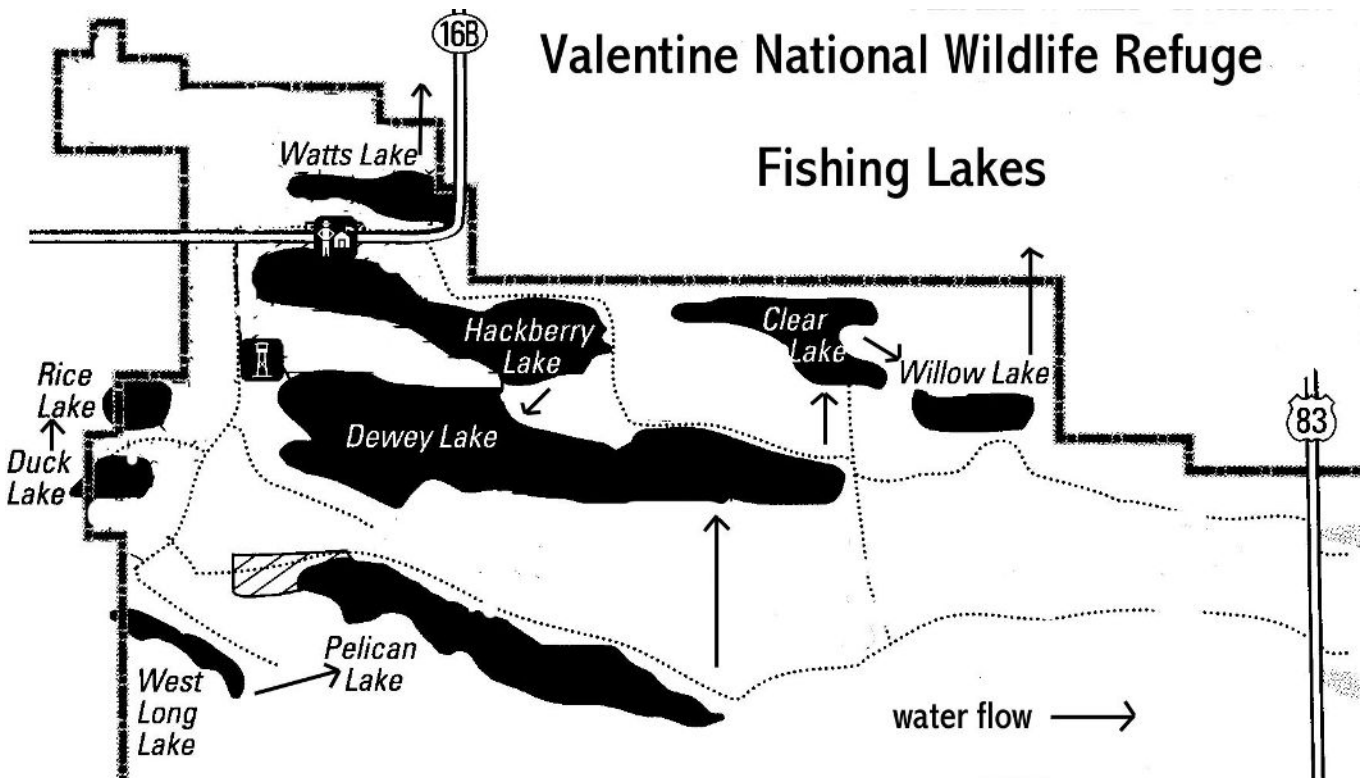
# Valentine National Wildlife Refuge

## 2023 Fish Survey Report

Zac Brashears Fisheries Biologist



The Valentine National Wildlife Refuge (VNWR) is 71,516 acres and was established in 1935. The refuge not only protects a portion of the Sandhills but provides a resting, feeding, and nesting area for migrating waterfowl and habitat for many species of wildlife that use the refuge lakes, marshes, mid and tall grass prairies, and meadows. Public recreation including hunting and fishing are promoted at the VNWR. Nebraska Game and Parks Commission (NGPC) manages the lakes for recreational fishing in cooperation with the U. S. Fish and Wildlife Service (USFWS) as defined in a cooperative agreement between the USFWS and the NGPC. The VNWR contains 39 lakes of which 9 are open to fishing. Some of these lakes are too alkaline to support fish and a majority of the lakes are very shallow and can be heavily vegetated which makes them susceptible to frequent winter-kills and summer-kills. Those lakes that are open to fishing are: Watts, Hackberry, Dewey, Clear, Willow, Rice, Duck, West Long, and Pelican. Fish species found in these lakes include largemouth bass, bluegill, yellow perch, northern pike, black crappie, grass pickerel, black bullhead, and common carp. Fishing is permitted on the Refuge from 1/2 hour before sunrise to 1/2 hour after sunset. The use of internal combustion motors is prohibited on all Refuge lakes. Boats propelled with oars, paddles, or electric motors may be used. The possession or use of live or dead minnows and the possession of any fish not taken from Refuge waters is prohibited. Frozen or dead smelt may be used as bait.



Map of the Valentine National Wildlife Refuge lakes open to fishing south of Valentine, NE.

## Survey Methods

Nebraska Game and Parks personnel took over fish population surveys on the VNWR in 2014. Prior surveys were conducted by USFWS personnel out of the Pierre, SD office. Biologists use electrofishing to target Largemouth Bass at night and Common Carp during the day. Frame netting surveys are used to target shore-oriented species such as Bluegill, Yellow Perch, Black Crappie, and Northern Pike. Once these fish are collected they are weighed, measured, and a few scales are removed to determine the age of the fish and evaluate growth compared to other lakes. 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, sometimes lasting only a few days making sampling these species in several waterbodies relatively difficult. Winterkill severity also had impacts of abundances and size structure of many species sampled for across the refuge.

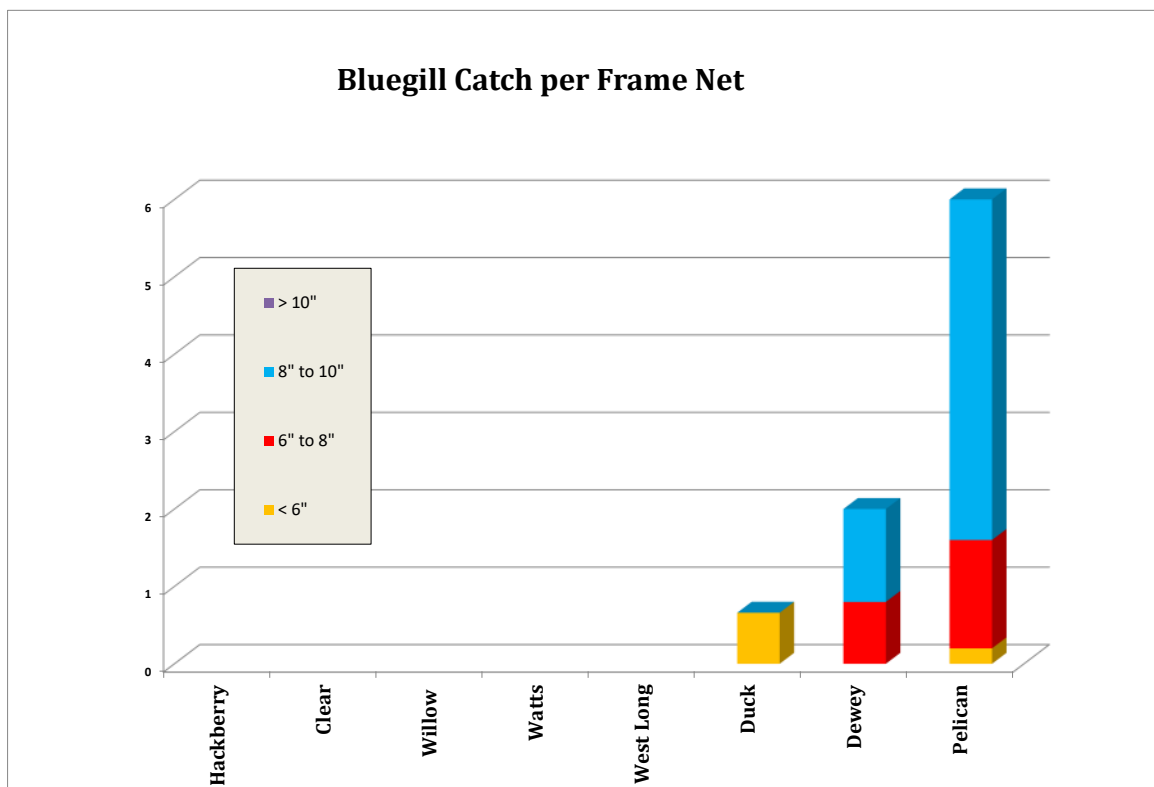
Anglers are also reminded these are small surveys of the fish population and some sizes and species could have been missed in the netting surveys. But overall, these surveys are important in determining long-term trends. Many sandhill lakes were impacted last winter. Game and Parks personnel will continue to monitor fish populations throughout the year. We have already stocked numerous fish species across these lakes with more to come. Some lakes may need rotenone renovations in the future as numerous game fish species perished during the winter but unfortunately Common Carp persisted in some of these waterbodies.



Common Carp congregated at a spring at Pelican Lake during the winter of 2022/2023.

## Bluegill

Bluegill and Largemouth Bass populations were two species most affected during the winterkill of last year. As shown from the graph below no bluegill were sampled in Hackberry, Clear, Willow, Watts, and West Long. The largest abundance sampled during 2023 surveys was at Pelican Lake but numbers were still very low with less than 6 fish per net sampled. The fish over 8 inches should continue to spawn and contribute to the overall population at Pelican Lake. Evidence of partial and severe winterkill at a number of lakes helped personnel determine where to stock bluegill to supplement the overall population. Bluegill populations were low in Dewey as well but electrofishing surveys later during the summer and fall months indicated numerous smaller bluegill therefore no stockings occurred at this lake. Surveys will be completed in 2024 to determine if these fish recruited to the overall population. The largest Bluegill sampled in 2024 came from Dewey Lake and measured a little under 10 inches in length. During 2023, 650,586 Bluegill were stocked across multiple lakes on the VNWR to increase abundance and supplement populations.



**Panfish Regulations:** Bluegill, Yellow Perch, Crappie, Green Sunfish, Etc. Bag limit of 15 fish in combination and a possession limit of 30 fish.

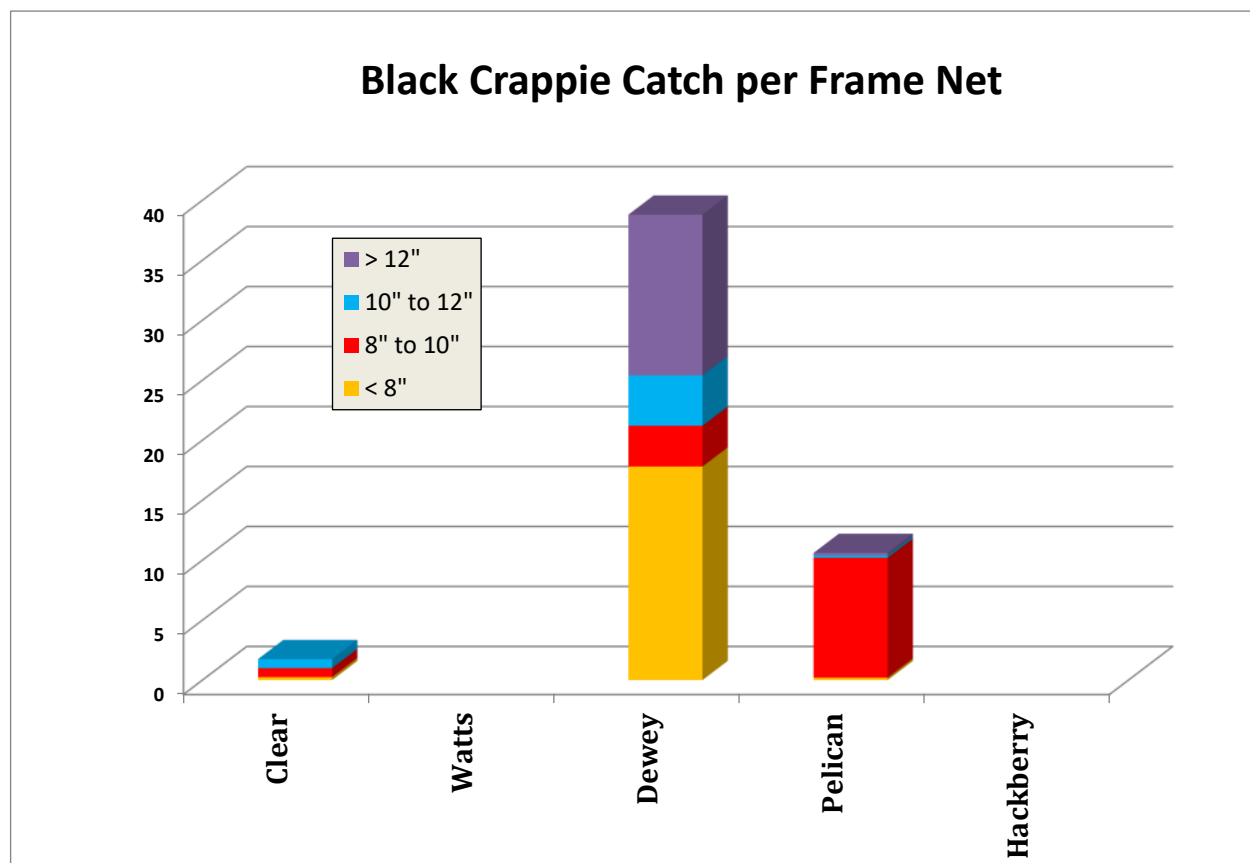
**New for 2024** - Special regulations now in effect for Pelican Lake and Duck Lake on the VNWR where the panfish daily bag limit of 15 shall include only one Bluegill 9 inches or greater in length.

## Black Crappie

Black Crappie populations seemed to overcome winterkill conditions a little better than other species across the VNWR. The largest Crappie population was at Dewey Lake with a net catch of 36 fish per net. These fish showed a good size structure with approximately 12 crappie per net over 12 inches in length. The largest Crappie sampled came from Dewey Lake and measured 14.9 inches. This population also showed some excellent recruitment of smaller Crappie which can be seen in the graph with 15 fish sampled per net.



Watts and Hackberry had significant winterkill and no Crappie were sampled in 2023. Pelican and Clear had some low to moderate winterkill but smaller populations do exist in these two waterbodies. Due to limited hatchery space in 2023 not enough Black Crappie were able to be raised to stock and supplement these populations. Production requests have been made for 68,000 Crappie for Hackberry and 23,000 for Watts in 2024.



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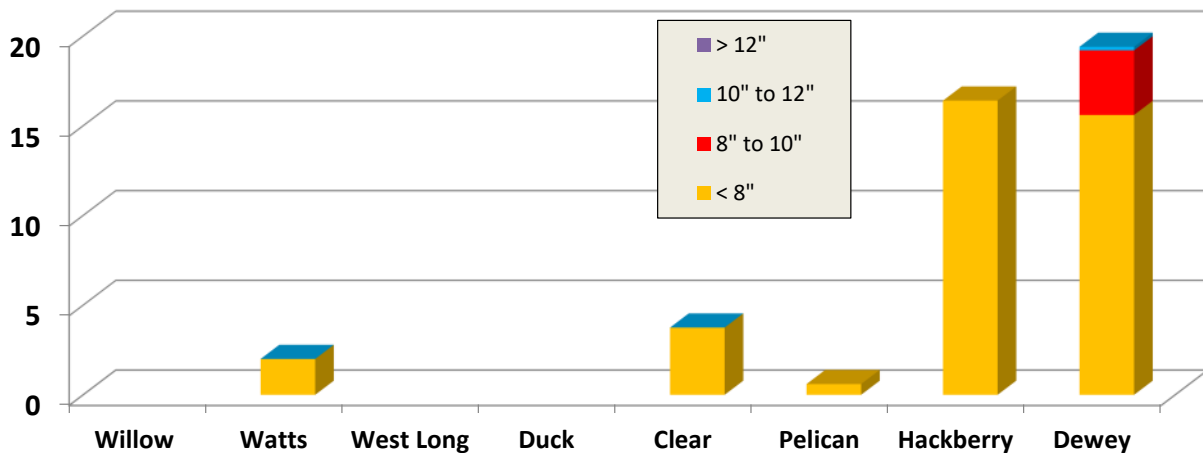
**New for 2024** - Special regulations now in effect for Pelican Lake and Duck Lake on the VNWR where the panfish daily bag limit of 15 shall include only one Bluegill 9 inches or greater in length.

## Yellow Perch

Yellow Perch populations across the VNWR took a pretty severe hit especially on smaller and heavily vegetated waterbodies. Surveys indicated decent Yellow Perch numbers at Hackberry and Dewey lakes with net catches of 15 and 18 fish per net. The largest Yellow Perch sampled came from Dewey and measured 10 3/4 inches. These surveys can be a little misleading because some of the populations observed were completed post Yellow Perch stocking in 2023. However, many of these lakes indicated there were some sort of Yellow Perch populations that made it through the winterkill even though abundance was lower than management objectives for each lake. Some lakes had very low abundances of Yellow Perch catching less than 5 per net. Biologists hypothesized that these smaller Yellow Perch less than 5 inches in length did not need as much oxygen or found a spring somewhere in the lake that allowed a few to survive. Due to their popularity with ice fishermen 474,489 perch were stocked in 2023 across many of these lakes to increase and supplement Yellow Perch populations.



### Yellow Perch Catch per Frame Net



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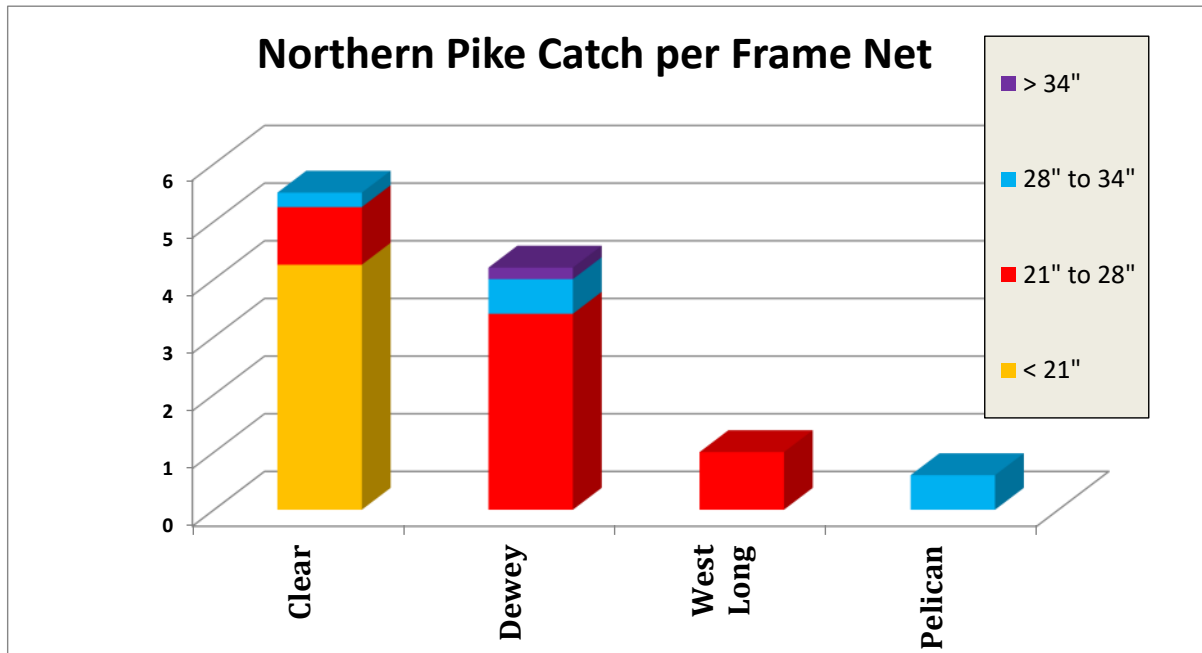
**New for 2024** - Special regulations now in effect for Pelican Lake and Duck Lake on the VNWR where the panfish daily bag limit of 15 shall include only one Bluegill 9 inches or greater in length.

## Northern Pike

Surveys in 2023 indicated that Northern Pike populations were also affected from the winterkill. The highest population indicated from surveys was Clear Lake with a little over 5 pike per net sampled. This population did indicate some smaller fish less than 21 inches recruiting to the population. Dewey Lake had the next highest abundance with approximately 4 pike per net. The largest Northern Pike, was sampled at Dewey a 38 inch fish. Northern Pike abundance was also very low in West Long and Pelican Lakes where less than 1 fish per net were sampled. West Long has always had a Northern Pike population but biologists try to remove them each year to increase abundance and size structure of panfish populations (Bluegill and Yellow Perch).

Interestingly, in 2023 surveys indicated a severe winterkill on West Long however 2 Northern Pike were sampled. Pelican Lake was stocked with Tiger Muskellunge following the renovation of 2018 due to Common Carp being observed. Northern Pike were surveyed in Pelican in 2021 and due to the fact they will outcompete Tiger Muskellunge no additional Tiger Muskellunge stockings will occur.

Hackberry Lake was renovated in 2021. A few smaller Common Carp were observed in 2022 therefore Northern Pike were stocked as an additional predator. Surveys in 2023 post winterkill collected no Common Carp. Efforts will continue to monitor this and stocking and management strategies will be utilized to minimize Common Carp numbers. In 2023, a total of 38,872 Northern Pike were stocked into Hackberry, Pelican, and Dewey Lakes.



**Northern Pike/Tiger Muskellunge Regulations on Refuge:** Daily bag limit of 3 fish with a possession limit of 10 fish. The daily bag limit shall include not more than one fish 34 inches or greater in length.

## Largemouth Bass

As stated earlier largemouth bass and bluegill populations were the two species that were impacted the most during the winterkill. No standard surveys were conducted for Largemouth Bass due to ongoing frame netting surveys across the sandhills documenting winterkill effects of various fish populations. Even though standard surveys were not completed, electrofishing was done on a number of waterbodies to indicate if any Largemouth Bass populations survived. Electrofishing indicated Largemouth Bass populations still exist even though abundance from winterkill may be affected at Dewey, Clear, and Rice Lakes on the VNWR. The biggest Largemouth Bass sampled was from Dewey Lake and measured 22 1/2 inches and weighed 6.9 pounds. A total of 107,447 fish were stocked in 2023 across the VNWR Lakes.



## Aquatic Habitat Plan Phase II

Over the past several years there has been a lot of work completed on the portion of the refuge that contains the nine public fishing waters. Area users have seen many improvements to the refuge including: roads, angler/boater access, dredging of channels to improve movement of water between lakes, and the installation of Common Carp barriers. Of the nine fishing lakes, four are currently free of Common Carp (Duck, Rice, West Long and Watts).

Due to continued monitoring of winterkill severity and fish populations present, the systematic renovation process of the 9 lakes open to fishing will be put on hold. Biologists will conduct population surveys for all species again in 2024 and assessments between U.S. Fish and Wildlife Service personnel and Nebraska Game and Parks personnel will be completed.





## Invasive Species

Over the past several years invasive species have become a rising concern in Nebraska. In 2015, a regulation was established to help prevent the spread of invasive species via boats and trailers. The 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 are now also located in Lewis and Clark Lake (2015), Lake Yankton and the Missouri River. **Anglers should be made aware zebra mussels were just recently documented in Lake Oahe, South Dakota.** 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 May through September. No evidence of these mussels has been discovered in any other lakes sampled, it is important to note that zebra mussels are spreading quickly in nearby South Dakota with expansion up the Missouri River Reservoirs, eastern South Dakota Glacial Lakes, and Pactola Reservoir in the Black Hills. Anglers and boaters fishing those waterbodies as well as the Valentine Refuge Lakes should be extra cautious and always follow CLEAN, DRAIN, DRY protocols.

Aquatic vegetation such as curly-leaf pondweed and Eurasian watermilfoil are also invasive species present in Nebraska. **Curly leaf pondweed is present in Merritt Reservoir.** Both of these plants form dense mats of vegetation near the water's surface which make recreational fishing, boating, and swimming difficult. Spreading of these plants can happen through stem fragmentation where a single segment of plant material can be transferred to another waterbody and form a new colony. One or both of these species have been documented throughout NW Nebraska at Merritt, Box Butte, Walgren, Smith WMA, Cottonwood SRA, and on Fort Robinson State Park. Therefore, removing any visible plant material from boats and trailers is a must and remember to **CLEAN, DRAIN, and DRY!**

**CLEAN-** Remove plants, animals, and mud by thoroughly washing 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](http://neinvasives.com).

For more information on fisheries management or activities on the Valentine National Wildlife Refuge contact:

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