

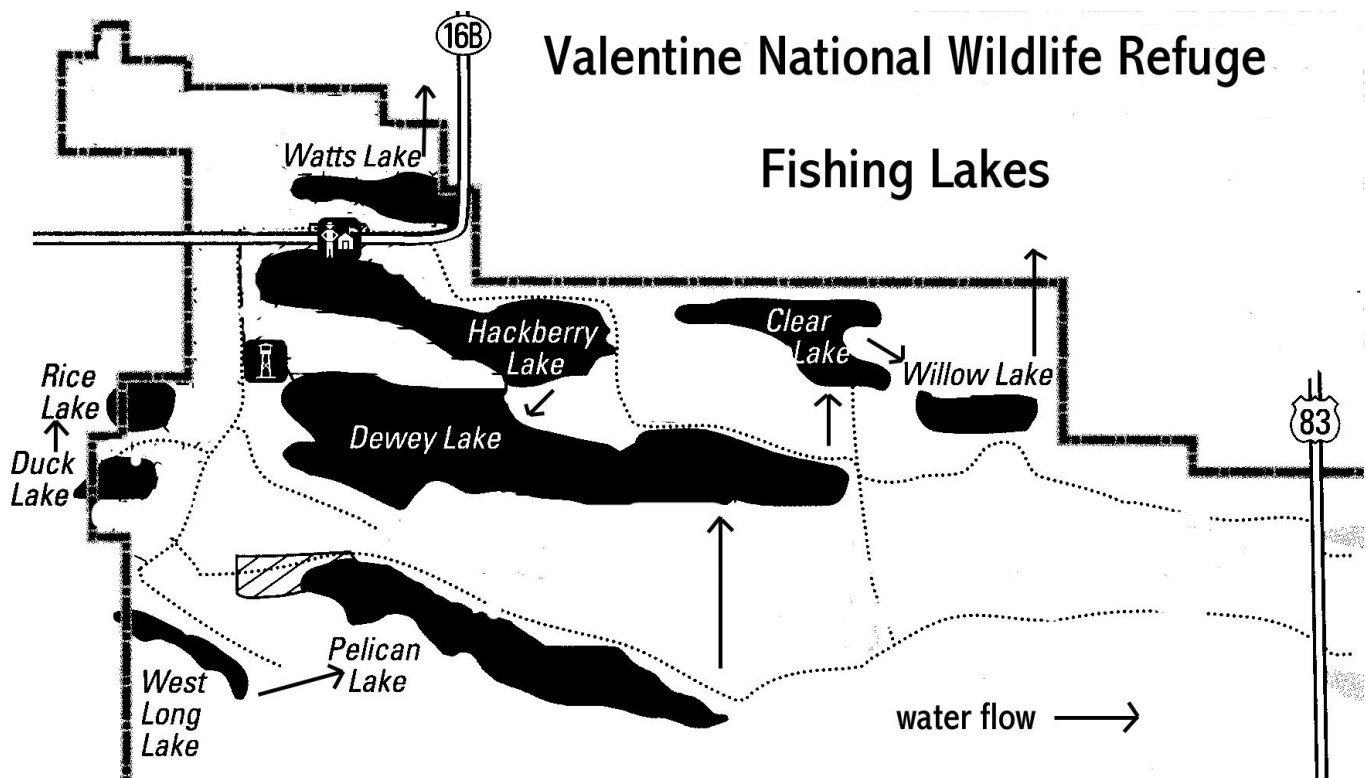
Valentine National Wildlife Refuge

2022 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. 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.

Valentine National Wildlife Refuge Winterkill conditions 2022/2023

In 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 some issues in some of the regions highly vegetated 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 sun 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, levels fish will push towards springs located throughout the lake searching for oxygen levels needed for survival as can be seen below.

We will not know exactly how severe these winterkills were on these lakes until we get out there this spring and survey the lakes with standard sampling gear. Game and Parks personnel has already started to develop a plan to restock lakes that had winterkill occur with species such as bluegill, yellow perch, largemouth bass and northern pike. Many of these lakes have not seen winterkill conditions like this in a long time since the 70's and 80's. They should rebound quickly providing opportunities again in 3-4 years. Oxygen levels in February 2023 were still good at Clear Lake and Rice Lake on the Valentine Refuge.

Anglers are encouraged to report dead fish this spring at one of the contacts listed in this document and remember all of these surveys were done prior to the winter of 2022-2023.

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



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.

The following graphs are compiled sampling data from 2020-2022, a three year time period.



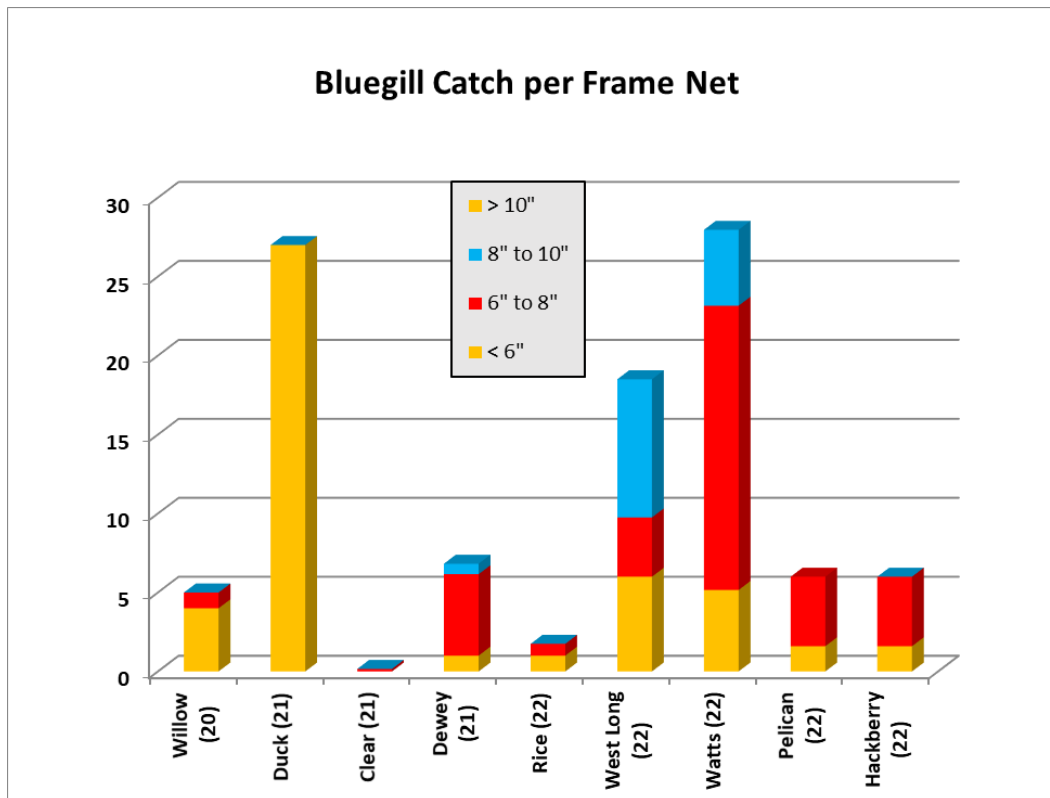
Bluegill

Bluegill are targeted year round on the VNWR and can be fun on light tackle or through the hole during the ice fishing season. Anglers from all over the US often travel to the VNWR in search of trophy bluegill over 10 inches. These systems typically have lower densities of bluegill than systems in the eastern part of the state. These sandhill lake systems are highly productive which allow bluegill to grow extremely fast.

Some of these lakes have better growth rates and that depends on several factors such as aquatic vegetation, water quality and other fish presence such as common carp.

As can be seen from the graphs all 9 lakes have some sort of a bluegill population. Watts lake had the highest catch rate of 28 bluegill per net.

These fish showed a great size structure with 64 percent of the population being between 6 and 8 inches and 17 percent over 8 inches in length. Duck lake had the next highest abundance although all fish sampled were under 6 inches in length. West Long also had a good catch of bluegill sampling 18.5 fish per net and 47% of those fish sampled were over 8 inches in length. The largest bluegill sampled was at Dewey and was sampled during electrofishing. This bluegill measured 10.6 inches.



Panfish Regulations: Bluegill, Yellow Perch, Crappie, Green Sunfish, Etc. Bag limit of 15 fish in combination and a possession limit of 30 fish. The daily bag limit shall include only five bluegill of which only one fish can be 10 inches or greater in length at Pelican Lake.

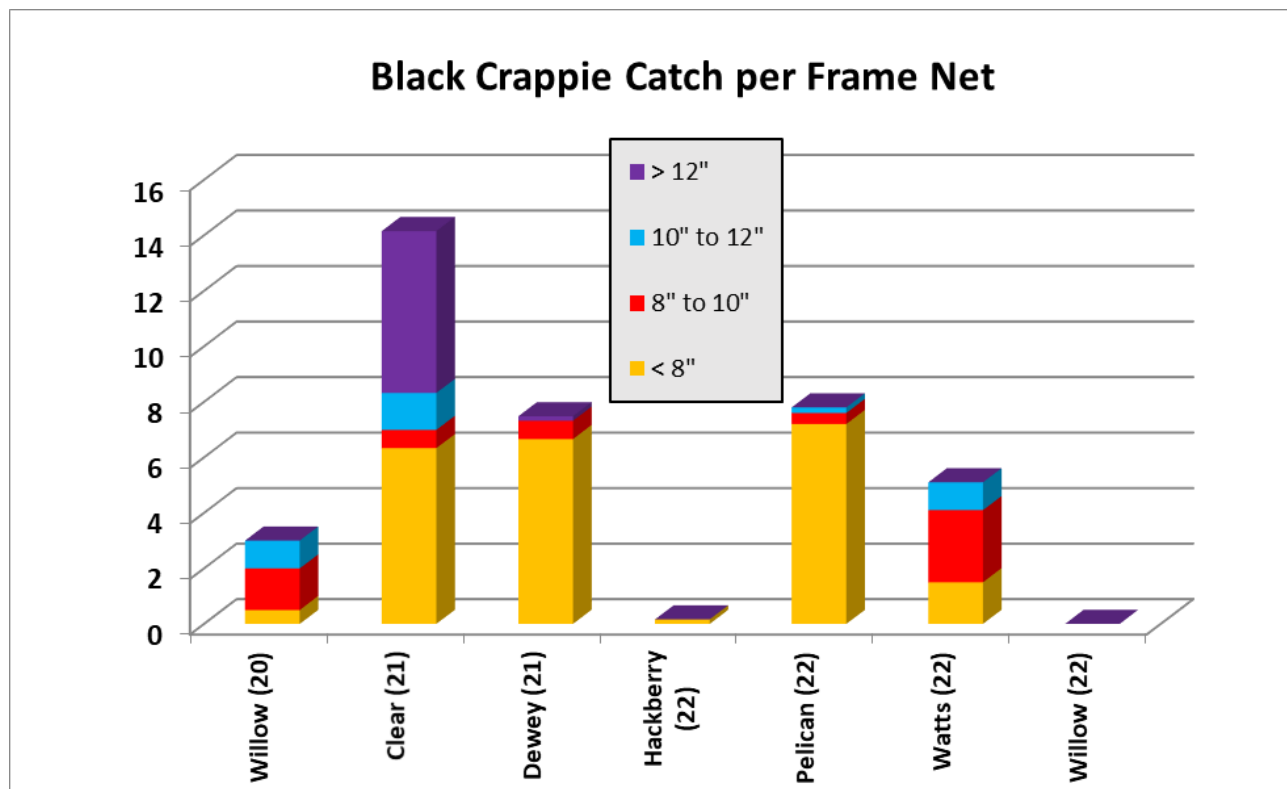
Black Crappie

Black Crappie populations are present in 7 lakes on the VNWR. These fish provide an additional panfish opportunity and persist even with the presence of high common carp populations. The highest crappie population was found at Clear Lake with a catch rate of 14 fish per net. Approximately 41% of these fish sampled were over 12 inches in length. The largest crappie sampled came out of Dewey Lake in 2021 and measured 14.6 inches.



Pelican, Dewey, and Clear are all showing signs of good recruitment with over 6 fish per net caught under 8 inches in length. These fish should provide angling opportunities in the upcoming years.

Anglers should target black crappie with jigs that represent small baitfish such as bluegill, which is a primary prey item for these fish.



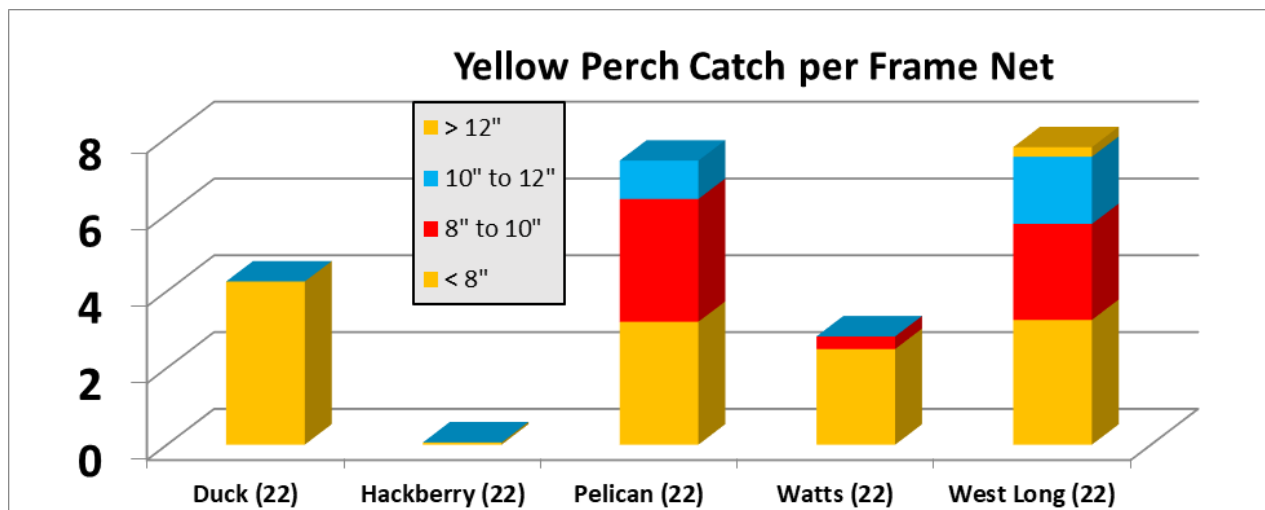
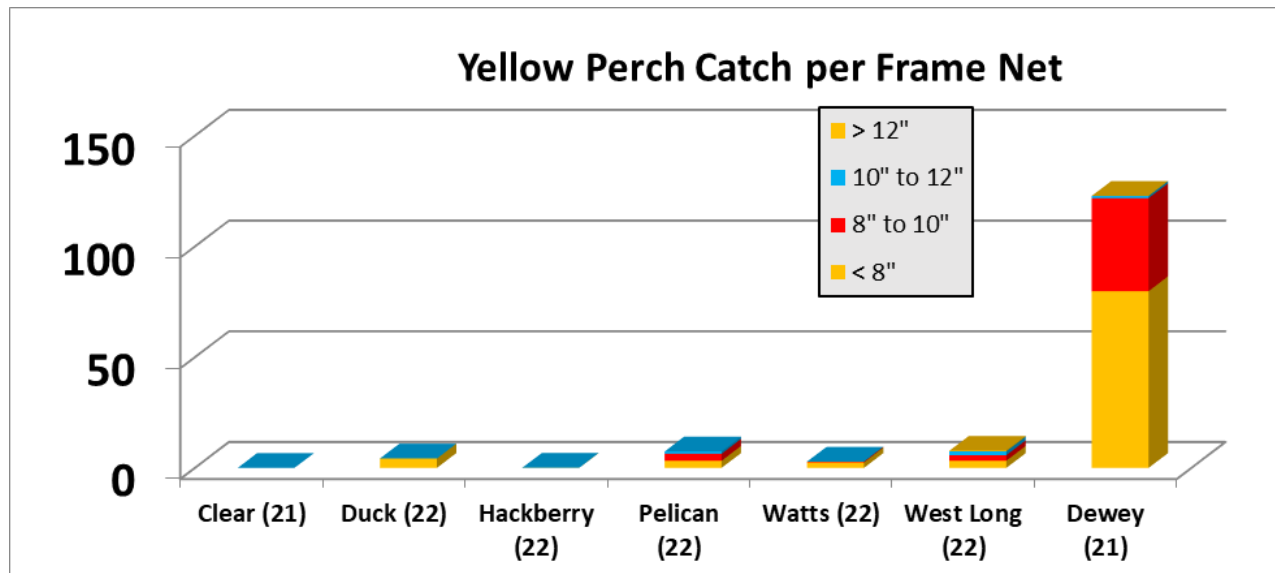
Panfish Regulations: Bluegill, Yellow Perch, Crappie, Green Sunfish, Etc. Bag limit of 15 fish in combination and a possession limit of 30 fish. The daily bag limit shall include only five bluegill of which only one fish can be 10 Inches or greater in length at Pelican Lake.

Yellow Perch

Yellow perch are the most sought after species at the VNWR. These fish are easily cleanable and make great table fare. Anglers should still practice selective harvest on these fish harvesting medium sized fish and letting the big spawning females go. These fish are what keeps these populations going. Perch populations fluctuate a lot mainly due to angling pressure and overharvest.

The surveys indicated Dewey had the highest catch rates for perch sampling 122.8 fish per net although 99% of these fish were under 10 inches in length. These fish should provide angling opportunities in 2022 and 2023. Once these fish are removed West Long had the highest catch rates which can be seen in the bottom graph sampling 7.75 perch per net. West Long also showed a good size structure with each size category sampled. West Long also had the largest yellow perch sampled at 14 inch fish.

Panfish Regulations: Bluegill, Yellow Perch, Crappie, Green Sunfish, Etc. Bag limit of 15 fish in combination and a possession limit of 30 fish. The daily bag limit shall include only five bluegill of which only one fish can be 10 inches or greater in length at Pelican Lake.



Northern Pike

Northern pike fishing is popular amongst anglers throughout Nebraska as well as other states. Nebraska is on the southern end of their native range but populations do exist across several of the lakes on the refuge. Northern pike are a cool water fish and need that thermal refuge at times throughout the year. During drought conditions lake levels drop and thermal refuge for these fish become smaller and disappear which can lead to lower populations of pike.

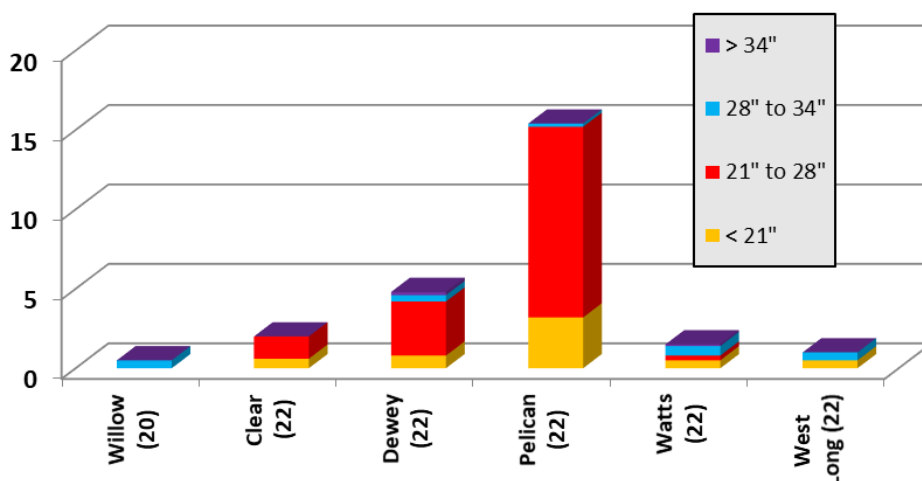
These fish are managed on the VNWR as an additional sport fish for anglers and also as a management tool for common carp control. Common carp control is a high priority on the VNWR as carp can be detrimental to aquatic habitats. Anglers normally target the fish during the spring after ice out or during the ice fishing season using tip ups.

Pike are sampled in late March as these fish venture into spawn in the shallow vegetated areas at these lakes. The spawning activity happens relatively fast and sometimes under the ice so survey results could be misrepresented. Seven lakes have pike populations although West Long and Watts have very low density populations. Common carp were not eliminated from Hackberry and is the other lake that has a pike population and was stocked in 2022. These fish in Hackberry should grow extremely fast and efforts to sample them will be made in 2023. The highest pike population this year was at Pelican Lake which had a net catch of 15.4 fish per net. The largest pike sampled at Pelican was right at 30 inches. Northern pike were never stocked into Pelican Lake but the population is increasing. Tiger muskellunge (northern pike x muskellunge) were stocked into Pelican following the renovation in 2018 since common carp were not eliminated. Tiger musky stockings will not occur any longer in Pelican due to the presence of northern pike in the lake.

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.



Northern Pike Catch per Frame Net



Largemouth Bass

Largemouth bass exist in all 9 lakes that are open to fishing on the refuge. Bass are the primary predator at these lakes and help control unwanted species such as common carp. Largemouth bass also help control panfish recruitment which allows the remaining fish to grow extremely fast without competition for available food.

Largemouth bass are sampled during the night with electrofishing gear as they venture into the shallow waters to feed.

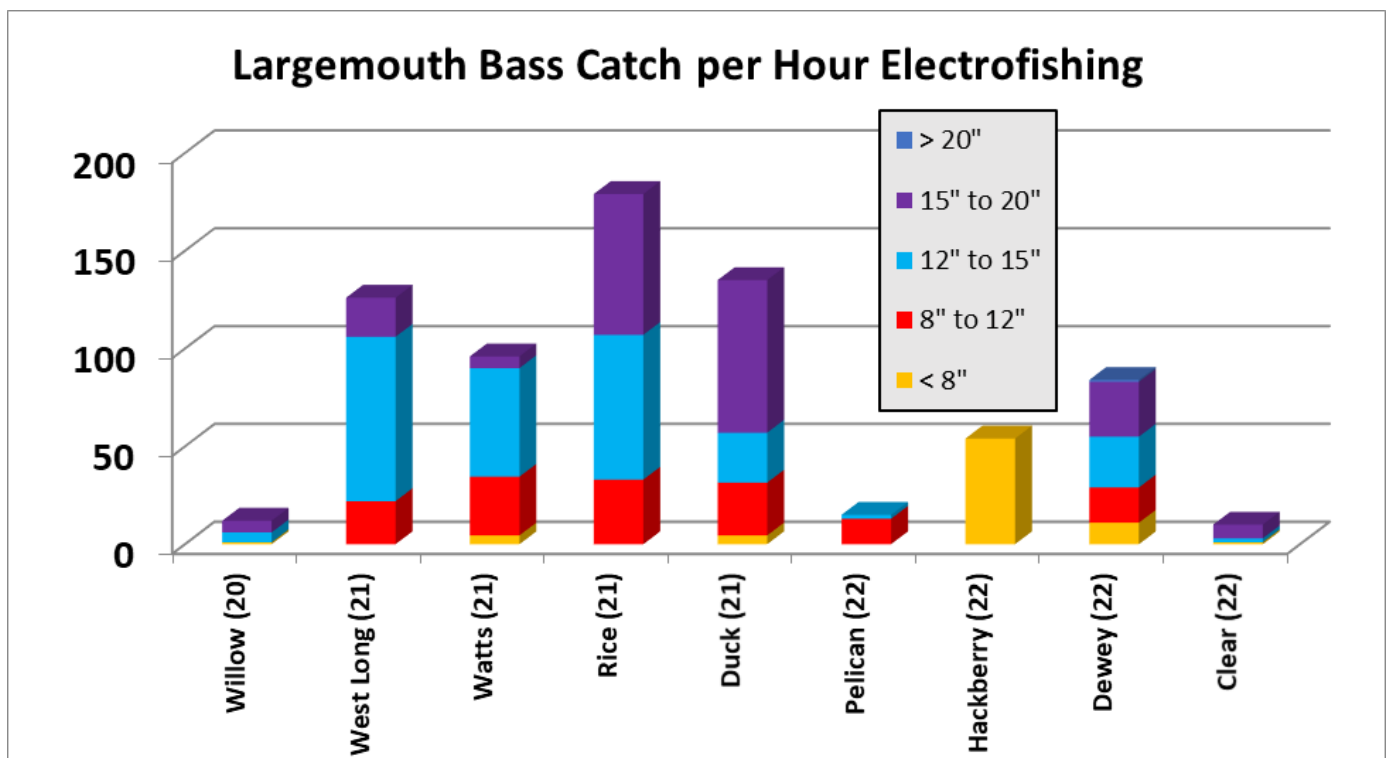
The surveys indicated bass densities ranged from 10 fish per hour at Clear to 179 per hour at Rice. Rice and Duck Lakes showed excellent size structure of bass. Approximately 40% of the bass sampled at Rice were over the statewide minimum of 15 inches. The largest bass sampled came from Dewey and measured 21.2 inches and weighed 6.8 pounds.



Clear Lake which had the lowest density of largemouth has also shown very low bluegill and perch populations as well. This can be attributed to the high abundance of common carp reducing aquatic vegetation with their feeding behavior and reducing water quality.

Largemouth bass are usually targeted during the spawning period in mid to late May or can be targeted with weedless topwater baits during the summer months when these lakes become heavily vegetated.

Largemouth Bass regulations: Daily bag limit of 5 with a possession limit of 10. The daily bag limit shall include no more than one black bass 21 inches or greater.



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 carp barriers. Of the nine fishing lakes, four are currently free of common carp (Duck, Rice, West Long and Watts).

Due to the possibility of winterkills, some possibly severe the systematic renovation process of the 9 lakes open to fishing will be put on hold until all lakes can be assessed. Oxygen readings taken during the months of January and February can be seen below. Readings below 1.5 parts per million or milligrams/liter can be detrimental to fish populations especially over long periods of time.



Watts-0.8 mg/l

Duck-0.7 mg/l

Rice-12.1 mg/l

West Long-0.7 mg/l

Pelican-0.8 mg/l

Hackberry-0.8 mg/l

Dewey-0.6 mg/l

Clear-5.6 mg/l

Willow-1.7 mg/l



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. 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 water milfoil 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. 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. Both or one of these species have been documented throughout NW Nebraska at Merritt, Box Butte, Walgren Lake, Smith Lake 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.

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

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Al Hanson (NGPC Manager) or Joe Rydell NGPC Biologist, (308) 763-2940 al.hanson@nebraska.gov, joe.rydell@nebraska.gov

Juancarlos Giese (USFWS refuge manager), (402) 376-1889 Juancarlos_giese@fws.gov