# **Northwest District Sandhill Lakes**

# 2023 Survey Summary

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# Introduction

The sandhill region of Nebraska is a unique geographical region comprised of stabilized sand dunes, exposed groundwater lakes in the valleys, and perched mineralized lakes on poorly drained soils. A few lakes are watered by artesian wells and springs while the majority of lakes depend on the water table and fluctuate with its seasonal levels. Most lakes in the sandhill region are either too shallow or too alkaline to support a long-term fishery. Sandhill lakes are typically shallow, vegetated, highly productive systems with fisheries that consist of yellow perch, bluegill, black crappie, largemouth bass, northern pike, black bullhead, and green sunfish. Some lakes may include additional species such as walleye, saugeye, smallmouth bass, catfish, common carp, or muskellunge. The following summary is for sandhill lakes with public access that were surveyed in 2023. Fisheries data from the Valentine NWR is not included in this report but can be found at <a href="http://outdoornebraska.gov/fishsamplingreports/">http://outdoornebraska.gov/fishsamplingreports/</a>. An interactive map of lake locations and species composition can be found at <a href="http://maps.outdoornebraska.gov/fishing/">http://maps.outdoornebraska.gov/fishsamplingreports/</a>.

# **Sampling Methods**

Sandhill lakes typically get surveyed at least once every 3 years for each priority species. Largemouth bass are surveyed at night by electrofishing while shoreline oriented species (bluegill, crappie, yellow perch, and northern pike) are sampled using frame nets. A couple sandhill lakes have walleye, saugeye and/or catfish populations that are sampled by gillnets in the fall. Species collected during surveys are counted, measured, weighed, and some scales removed for aging before releasing. Biologists use this information to monitor the health and size structures of each fish population. The following graphs and commentary are from surveys conducted in 2023 with suggestions on which sandhill lakes should produce quality fishing for each species. Efforts were made in 2023 to survey as many lakes as possible to identify potential impacts from winterkill. 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. Several of the surveys were one day sets that may not have total representation of the species population dynamics but indicates survival to calculate stocking needs.



# Winterkill results

Overall results were better than anticipated for sandhill lakes. Winterkill seemed to impact bass and bluegill populations the worst. Perch, pike and crappie appeared to persevere with smaller fish surviving better than larger, older adults. Evaluating the amount of dead fish that showed up when the ice came off was difficult. Fish eating birds such as gulls, cormorants, and pelicans as well as other scavengers such as coyotes and coons cleaned up a lot of carcasses as soon as they washed up. Several lakes showed no signs of dead fish at ice out, but still likely had significant losses that decayed under the ice since the winterkill events began so early in winter. This report will go through each lake and give an assessment of how the winter affected the fishery.



# Smith Lake WMA

Outside of the Valentine NWR, Smith Lake WMA was one of the first lakes to report signs of oxygen issues. Oxygen readings less than 2.0 mg/L will cause fish to stress and die. Oxygen readings at Smith WMA were approximately 0.6 mg/L for an extended amount of time. As the ice came off, bluegill, crappie, perch, bass, and northern pike were all found in low numbers sunk along the shorelines. It is likely that the majority of the mortality decayed and broke down under the ice.

A spring frame net survey detected survival of black bullhead, black crappie, northern pike, yellow perch, and golden shiners. Yellow perch abundance was low at 9.5 fish per net with an average size of 6 inches. The largest perch sampled was 9 inches in length. Yellow perch abundance typically runs > 30 perch per frame net during the same peak

spawn time frame. Northern pike survival was slightly down at 2.75 fish per net. Pike ranged from 21 to 33 inches in length. Only 3 crappie were surveyed and they were all under 6 inches in length. No bluegill or largemouth bass were observed.

Smith Lake was restocked with yellow perch, bluegill, and largemouth bass to boost the populations quicker. Although Smith Lake did take a hit in abundance and size to most species, anglers may still find some success in 2024 on harvestable size perch and pike. New panfish regulations will be implemented at Smith Lake WMA beginning January 1, 2024. The new regulations are explained in detail in the regulation section later in this report.





# Frye Lake

Frye Lake also had a period of low oxygen hinting at the possibility of some winterkill with an oxygen reading of 1.22 mg/L. Some ice anglers were still finding success with bluegill during this time frame which gave hope of better oxygen in other parts of the lake. When the ice came off, no dead fish were observed.

Frame net surveys documented bluegill, yellow perch, black crappie and largemouth bass survival. Both crappie and yellow perch catch rates were very low at less than one fish per net and average sizes at 2.7 inches (crappie) and 4.7 inches (perch). Bluegill catch was closer to normal but dominated by smaller bluegill under 6 inches in length. Although a couple bluegill over 10 inches were sampled, the size structure suggests that a loss of larger fish may have occurred.

Largemouth bass catch was also lower in 2023. Night electrofishing collected 124.5 bass per hour of effort which is down from the long term average of 284 bass per hour. Over 36 percent of the catch was over 15 inches with the largest bass sampled at 16.5 inches. Angler reports throughout the summer suggest good catch rates with some bigger bass over 18 inches possible.

Fingerling perch and bluegill were stocked in Frye Lake in 2023 to boost the populations following the possible winterkill.

An angler access project is planned for Frye Lake in 2024. Upgrades are planned to improve boat access, provide some bank access, improve parking, and upgrade the restroom. Several upgrades will comply with the Americans with Disabilities Act standards.

New panfish regulations will be implemented at Frye Lake beginning January 1, 2024. The new regulations are explained in detail in the regulation section later in this report.





# Shell Lake WMA

Oxygen readings at Shell Lake were similar to Frye at 1.19 mg/ L Dissolved Oxygen. Access to Shell Lake through the winter was tough due to the heavy snows in the area and no angler use was reported. No dead fish were reported as the ice came off in April.

A frame net survey detected survival of black crappie, yellow perch, bluegill, pumpkinseed sunfish, northern pike, and largemouth bass. The bluegill catch was normal for shell with a catch rate of 7.75 fish per net and



all sizes up to 9.4 inches in length. Black crappie catch was low at 2.5 fish per net but 60 % of the catch was over 12 inches. Very few yellow perch were collected in the survey, but several skeins of perch eggs were observed attached to shallow vegetation suggesting a good number of successful spawners still survived.

Shell lake has been a destination for large bass and pike over the years and half the pike catch was over 28 inches. Frame nets are not a representative tool for sampling largemouth bass but one 18.5" largemouth was incidentally captured during the survey. Based on

these results, it is likely that the Shell Lake fishery experienced little to no winterkill impacts. No fish were stocked into shell in 2023 allowing the limited resources to go where they are most needed.

# Walgren Lake

Walgren Lake is not a sandhill lake but it is managed like a sandhill lake with similar species and is therefor included in this report. Walgren Lake had some extremely low oxygen readings during the winter at 0.6 mg/L

and angler reports of seeing dead crappie with underwater cameras. As the ice came off, several dead bluegill, crappie, catfish, largemouth bass and perch were observed along the shoreline. Although the outlook looked bad, the spring frame net survey showed surprising results. Good numbers and size of black crappie, bluegill, northern pike, and yellow perch all survived the winter. Yellow perch catch was 4.5 perch per frame net with fish up to 10.6 inches.



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# Walgren (cont.)

As expected the black crappie catch was down from 2021 to 15.5 crappie per frame net. Size structure was similar at 9.25 inches on average with a few larger fish over 10 inches.

Bluegill catch was 8.5 fish per net with an average size of 6.9 inches. Although abundance was reduced some on all species, the populations should respond with some better growth rates to get some larger sized panfish in the next couple years from the one's that survived.

# Crane Lake

Crane Lake on the Crescent Lake National Wildlife Refuge (NWR) was one of the few sandhill lakes that appeared to survive the winterkill in great shape. Black crappie, bluegill, and yellow perch were all sampled in good abundance. Crappie were mostly small with an average size around 6.5 inches but some fish pushing 8



inches were observed. Past surveys collected a few larger individuals that may still persist in the population. Bluegill catch doubled to 80.3 gills per frame net. All sizes of bluegill up to 8.2 inches were sampled. Most anglers coming to Crane Lake are looking for yellow perch. The population was similar in abundance to 2022 at 433 perch per frame net. The average size was approximately 7.5 inches with a few perch over 10 inches. Crane Lake will be a top destination for yellow perch abundance in the sandhills for 2024.



# Island Lake

Island Lake had indications of low oxygen with a reading of 0.68 mg/L dissolved oxygen during the winter. As the ice came off, lots of dead fish were washing up on the ice and in the shallows. It was obvious that the winterkill was significant. Frame net survey and electrofishing survey both came up with no live fish. In fact, Island Lake was the only sandhill lake where no live fish were detected after multiple survey events. If Island Lake was indeed a complete winterkill, the benefit of eliminating common carp from a productive sandhill lake without needing to chemically renovate is a blessing. Only time will tell.

Island Lake was restocked with bluegill, yellow perch, largemouth bass, and walleye in 2023. Black crappie will get stocked in 2024 as well as additional stockings of perch, bass, and walleye.



New panfish regulations will be implemented at Island Lake

beginning January 1, 2024. The new regulations are explained in detail in the regulation section later in this report.

# Smith Lake (FWS)

Smith Lake on the Crescent NWR had oxygen readings around 0.78 mg/L during the winter and suspect for some winterkill. Smith was recently renovated in 2021. Drought conditions caused lake levels to remain low till 2022 when it was fully stocked with perch, bluegill, black crappie and smallmouth bass. Gamefish abundance was already low prior to the winter of 2022-2023. However, a frame net survey in 2023 only turned up one 5-inch yellow perch. Smith Lake was restocked with bluegill, yellow perch, and black crappie in 2023. Smallmouth bass, are planned to be stocked in 2024.

New panfish regulations will be implemented at Smith Lake (FWS) beginning January 1, 2024. The new regulations are explained in detail in the regulation section later in this report.

# Blue Lake (FWS)

Blue Lake was not surveyed in 2023 but angler reports suggested survival of game fish. It is likely that Blue Lake had little to no winterkill due to the available depth, and lack of aquatic vegetation.

New panfish regulations will be implemented at Blue Lake beginning January 1, 2024. The new regulations are explained in detail in the regulation section later in this report.

# Crescent Lake

Crescent Lake was one of the few sandhill lakes that did not document low oxygen levels over the winter. Spring frame net survey documented survival of all species present in Crescent Lake. Yellow perch catch increased to the highest catch since 2014 at 10 per net. The average size was around 8 inches with some fish over 10 inches present in the population. Black crappie catch was similar to 2022 at 6 per net. Over 75 % of the crappie catch was between 10 and 12 inches.

Northern Pike an muskie are also found in Crescent Lake. Abundance is low for both species but fish over 30 inches are common.

Saugeye were stocked in Crescent Lake from 2015 to 2018 but were not developing in to a fishery. 2019 to 2023 walleye have been stocked and are doing well. Walleye catch was 10.3 fish per gillnet in 2023 with 54% of the catch over 15 inches. Anglers may still encounter a saugeye in Crescent.





#### Defair

Water levels were very low in Defair in 2023 and despite a period of low oxygen readings over the winter, some yellow perch still survived. Spring electrofishing collected a handful of 6 to 8 inch perch. No crappie, bluegill, or bass were observed. It appears drought and winterkill may have been significant. Defair was restocked with yellow perch, bluegill and largemouth bass in 2023.

An angler access improvement project is scheduled for Defair in 2024. The project will improve access for small boats and kayaks as well as well some improvement to the parking area. With improved ramps and access planned for Avocet and Frye, Defair will remain more primitive for smaller water craft.



# **Cottonwood Steverson Lakes**

Oxygen readings at Steverson Lake were below 2.0 mg/L (1.88 mg/L) but no signs of winterkill were observed in Cottonwood or Steverson

Lakes. Spring frame net survey showed survival of largemouth bass, crappie, muskellunge, common carp, and walleye. Crappie catch was 5.3 fish per frame net with 50% of the catch over 10 inches.

Muskie research continues at Cottonwood Steverson WMA to evaluate population dynamics of Nebraska Muskie. The biggest muskie sampled was 41.3 inches in 2023.

Walleye /saugeye catch remained low in 2023 at 1.25 fish per gillnet. Several saugeye were observed but not collected during electrofishing efforts for muskie and shad.

Cottonwood Steverson boat ramp was repaired in the fall of 2023. High water starting in 2019 washed away rip-rap and a crack and separation was observed in the concrete ramp. Contractors, fixed the ramp, repaired sidewalks and ADA pad and added rip-rap and gravel to the access site.



# Home Valley

Home Valley was one of the few sandhill lakes that did not show any sign of low oxygen levels over the winter. Angling pressure was high on Home Valley as long as the ice held up well into March 2023. Yellow

perch and crappie catches were both low with catch rates of 1.7 perch per net and 1.75 crappie per net during the spring frame net survey. Most of the perch observed were over 12 inches. Home Valley will be the top public waters destination for 2024 for anglers looking for trophy perch in the sandhills. Although the crappie catch was low, some crappie over 15 inches still persist. Crappie are a short lived species compared to other panfish species and the larger ones may be reaching the end of their lifespan.

New panfish regulations will be implemented at Home Valley beginning January 1, 2024. The new regulations are explained in detail in the regulation section later in this report.



# **Rat and Beaver**

Rat and Beaver was not tested for low oxygen levels as the road to the lake was impassible during the heart of the winter. A spring frame net survey collected largemouth bass, bluegill, and bullheads. The bluegill catch was 1.25 fish per frame net with an average size of 5.3 inches. It is likely that there were some winterkill impacts at Rat and Beaver. Yellow perch and bluegill were stocked at Rat and Beaver in 2023 to boost the populations in case of winterkill.

New panfish regulations will be implemented at Rat and Beaver WMA beginning January 1, 2024. The new regulations are explained in detail in the regulation section later in this report.

# **New Panfish Regulations**

New panfish regulations have been approved on several sandhill lakes beginning January 1, 2024. The daily bag limit for panfish remains at 15 fish in combination. However at Smith Lake WMA, Frye Lake, Smith Lake (FWS), Island Lake (FWS), Blue Lake (FWS), Pelican Lake (FWS), and Duck Lake (FWS), if you choose to keep bluegill as part of your 15 fish panfish limit, only one bluegill 9 inches or longer is allowed in the bag limit. It takes a bluegill 8 to 9 years to reach 9 inches and over 10 to 12 years or longer to reach 10 inches. The goal of this regulation is to protect those older, larger fish to keep them in the fishery longer and produce some potential trophies while encouraging harvest of smaller bluegill. On Home Valley, Rat and Beaver WMA, Blue Lake (FWS), Island Lake (FWS), Smith Lake (FWS), Frye Lake, and Smith Lake WMA if you choose to harvest perch as part of your 15 fish panfish daily bag limit, no more than 5 perch 10 inches or longer, of which no more than one of those 5 perch can be 12 inches or longer can be included in the daily bag limit. Female perch grow faster than male perch and often reach sizes of 10 inches or longer first. Limiting the harvest on females will help maintain the perch population while encouraging more harvest on slower growing males. These sandhill lakes have a history of boom and bust perch fisheries that seldom recover from over harvest until a winterkill, or renovation starts them over. This regulation hopefully will create a more stable perch fishery and improve the trophy potential for yellow perch.

# **Aquatic Invasive Species**

Although Zebra mussels are a high concern across the state and nation, invasive plants such as Eurasian Watermilfoil and Curly-leaf Pondweed are both serious threats to sandhill lakes. These shallow lakes can become 100 percent covered and make fishing difficult to nearly impossible. Eurasian Watermilfoil was documented in Cottonwood Lake SRA, and Walgren Lake. Curly-leaf pondweed has been documented in Smith Lake WMA. 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. 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.

For additional information about fisheries management in the sandhills please contact the following personnel by phone or email address listed below.

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