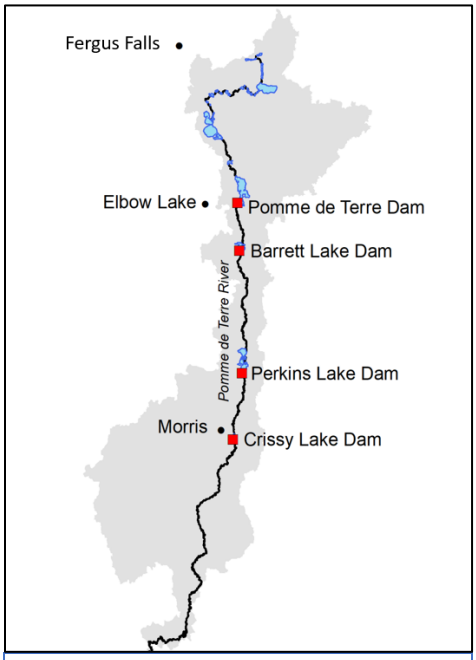
Fragmented Rivers: Reconnecting the Pomme de Terre



Map of dams on the Pomme de Terre River. Dam locations are depicted by red squares.

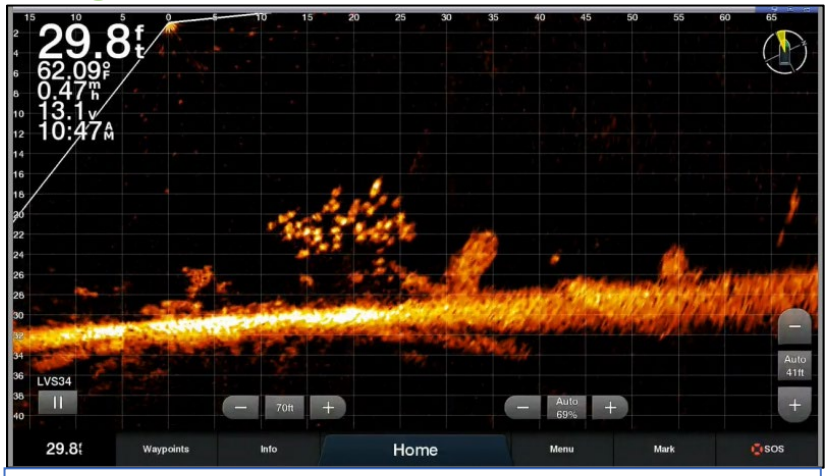
Several barriers currently exist on the Pomme de Terre River that impede the movement of fish and other aquatic organisms, but that is about to change. Lake Crissy Dam, the furthest downstream barrier, was constructed in 1939 and is well past its projected lifespan of 50 years. The aging dam is causing both safety and biological concerns. For example, low head dams cause a back current, which can trap both animals and people, resulting in a drowning hazard. The dam is also causing downstream erosion that needs to be addressed. In addition, 15 species of fish found downstream of the dam are not found upstream, signifying that it has been a major barrier to fish movement. This includes species that would be of interest to anglers such as channel catfish, white bass and lake sturgeon.

Many native mussel species rely on these and other fish as hosts during their reproductive cycle. Female mussels will lure in fish before releasing glochidia, the small larval offspring of mussels, into the mouths of fish. Here the glochidia attach to the gills of the fish and are temporary parasites, while they develop for a period of weeks to months. Once they develop into juvenile mussels, they detach from their fish host and fall to the lake or stream bed as free living mussels. This is the primary way mussels are distributed through a water body; therefore, a mussel's distribution is directly related to the host fish's distribution. As a result of the dam, eight species of native mussels are now absent upstream. This makes the Lake Crissy Dam the 2nd largest impact to biodiversity in the entire Minnesota River Basin.

Example of a rock arch rapids design used at Pelican Rapids after removing the existing dam.

Modifying the Crissy Lake Dam with rock arch rapids would address all of these concerns, with construction anticipated to start in 2026. However, three other dams exist upstream, Perkins Lake Dam, Barrett Lake Dam and Pomme de Terre Lake Dam, so a system-wide approach is needed. In 2006, the Barrett Lake Dam was modified with a rock arch rapids to allow fish passage, but no passage currently exists at Perkins or Pomme de Terre lakes. Construction is anticipated to begin in the fall of 2025 on both the Perkins Lake and Pomme de Terre Lake Dams, to modify them with rock arch rapids. The completion of these three projects will restore 116 miles of stream that have been disconnected for over 86 years!

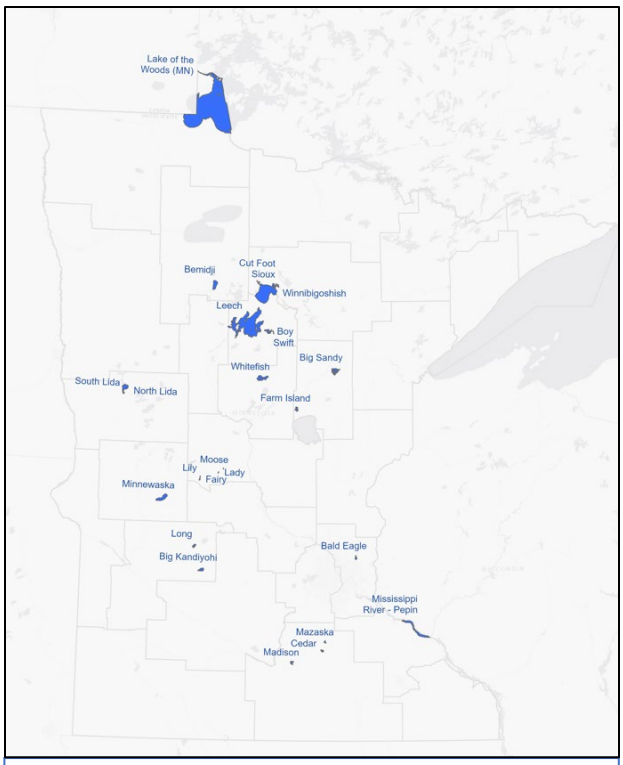
Forward-Facing Sonar: Examining Creel Data



Screenshot from a forward-facing sonar unit of both fish and bait. Grid lines depict distance in feet from the transducer.

Forward-facing sonar (FFS), probably the single most contentious topic in the angling community right now, seems to be at the forefront of every outdoors publication, video and social media post. Forward-facing sonar, often referred to as live imaging, was first released to the recreational fishing market by Garmin in 2015 with the release of Panoptix. This technology gave anglers the ability to see directionally, over 100 feet in front of their transducer, in real time. Garmin further improved on the distance and resolution of this technology with the release of Livescope in 2018. Both Lowrance (Active Target in 2020) and Humminbird (Mega Live in 2021) later followed suit, and all three companies have also recently released updated versions (e.g., Livescope Plus/XR, Active Target 2 and Mega Live 2). Given the capabilities of this technology, some anglers have expressed concern over the potential effects on our fisheries.

With the use of recent creel data, we can examine the potential effect of FFS. Creel surveys collect information on what anglers caught and harvested versus released, the size of those fish, what sonar type was used and much more. Many of you may have been interviewed by a creel clerk before, as you were fishing or when leaving the lake, as part of these surveys. The inclusion of forward-facing sonar in these creel surveys began on some lakes as early as 2021, with more data being collected every year since. To date, we have analyzed data incorporating over 39,000 anglers, a very large data set, with data continuing to be collected from across the state even as you read this. So far, the results have been pretty interesting and may surprise some anglers.



Map of lakes where creel data has been collected on forward-facing sonar use.

Forward-facing sonar use saw a substantial increase in Minnesota from 10% in 2023 to 20% in 2024, likely because of the release of new models and the discounting of older generations. In addition, FFS use tends to be higher in our large walleye lakes than the small and medium sized lakes throughout the state. However, catch and harvest rates of FFS users, when compared to the users of all other forms of sonar (e.g., 2D, down imaging, side imaging, etc.), were not significantly different during the open water season for sunfish, crappie and walleye. While FFS is probably beneficial for certain types of fishing, other technologies such as side imaging, which can scan hundreds of feet off each side of the boat and at much higher speeds, allow anglers to cover more water more quickly. In addition, FFS isn't as helpful when using presentations such as trolling, where anglers are able to cover more water and find active fish.

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There are two methods of creel surveys conducted during the ice fishing season that need to be analyzed separately. Roving creels, which are surveys where the creel clerk is conducting interviews out on the lake as people are fishing, typically occur on small and medium sized lakes. Access-based creels, as the name implies, are where the creel clerk sits at the access and interviews anglers as they come off the lake, which typically occurs on our large walleye lakes. While this may not seem like a big deal, there are some key differences in this data, namely that access-based creels incorporate overnight trips, which is important when examining the results.

During the ice fishing season is when we would think the technology would have the greatest advantage, being able to drill a single hole and look 100+ feet in each direction, increasing the amount of water that anglers can cover. Of the data analyzed so far, hard water FFS users had higher catch rates for walleye and crappies, higher harvest rates for crappies, and lower harvest rates for sunfish in roving creels. However, no significant differences were observed in the access-based creels for any of these species, which may be due to a couple of factors. Access-based creels are on large walleye lakes, which tend to be destination fisheries where most anglers are fishing out of permanent ice houses. Permanent ice house anglers are less mobile, so as a result, the technology is less effective. In addition, these creels incorporate multi-day trips, and while anglers may have lines down overnight, the technology isn't benefiting anglers while they are sleeping.

Across all lakes, most anglers using FFS are using it in permanent ice houses (58%), which tend to have much lower catch rates than portable or open-ice anglers. The only harvest rate that was higher was for crappies in roving creels. While statistically significant, this was only one more crappie harvested for every 6.7 hours of fishing, so likely insignificant biologically. While there are obviously some exceptions, in general FFS users in Minnesota tend to harvest a lower proportion of their catch than other anglers. So, there is currently no data to suggest that FFS is going to lead to the collapse of fish populations in Minnesota. Every time a new technology (e.g., outboard motors, 2D sonar, GPS, side imaging, etc.) has been released to the market, it has caused concern which is understandable. However, anglers should know that the DNR has been and will continue to collect data on the subject into the future.

Employee Spotlight: Jace Sando

Jace Sando, Glenwood Fisheries Technician, holding a smallmouth bass caught while fishing at night.

In January of 2025, Jace Sando started as the Fisheries Technician here at the Glenwood Office. He is originally from Marshall, MN, where he enjoyed fishing and hunting for a wide variety species. Jace received his B.S. degree in Wildlife and Fisheries Sciences from South Dakota State University. During his time as an undergraduate, he was fortunate to start his career with the DNR as an intern with the fisheries crew in Windom. In between graduating and accepting the technician position, Jace gained experience in a variety of places. In 2015, he helped raise muskie, walleye, smallmouth bass, white sucker, and northern pike for a private operation in South Dakota. He then worked as a Creel Clerk for the MNDNR on Big Stone Lake out of the Ortonville office for a year. After assisting the Ortonville office with walleye fingerling harvest for a couple of years, Jace worked as a Research Technician for four years at Tru-Shrimp, raising whiteleg shrimp from broodstock in the hatchery to jumbo-sized shrimp in the harbor at Balaton, MN. In 2022, Jace returned to the MNDNR as a Hatchery Specialist in Peterson, MN raising lake trout, brook trout, and splake. Jace is excited to be a part of the crew here at Glenwood and has shown an interest in the abundant fishing and hunting opportunities this part of the state offers.

Glenwood Muskies: A New Approach

Chris Uphoff holding a 52.75 inch muskie caught while electrofishing on a Glenwood Area lake as part of a population estimate.

The Glenwood Area has three managed muskie waters: Miltona, Lobster and Oscar. Based on stocking rates, Lobster is managed as an action fishery, Miltona as a trophy fishery, and Oscar as a bonus fishery. Muskie sampling techniques and management have undergone several changes in these lakes recently. Historically, muskies were sampled using large-frame trap nets in the spring that began when water temperatures were in the mid-40s and warming, in an attempt to sample muskies that were moving up shallow to spawn. These surveys were conducted with 10 to 15 nets a day, depending on the lake, over the course of 10 days. Muskie sampling has been done this way for decades, and while useful for examining the size structure of the population, it isn't useful for tracking changes in abundance or density. This method is dependent on a stable warming trend, which is rare in the spring. A cold or storm front would push muskies to deeper water where they weren't vulnerable to our nets. This resulted in catch rates that were highly variable, over three times higher or lower between surveys, and we know the population was not fluctuating in the same way.

In 2019, we decided to make a change and do multiple year population estimates (i.e., an estimate of how many muskies are in the lake). To do this we began using passive integrated transponder (PIT) tags, which are about the size of a grain of rice and inserted under the skin of the fish using a syringe. PIT tags, when scanned, give a 16-digit number that allows us to identify individual fish. This allows us to develop capture histories that can then be used to generate a population estimate, which is far more useful when trying to evaluate muskie populations. We also began PIT tagging all stocked fingerlings in 2022, allowing us to collect information on age, growth, natural reproduction, survival and more.

In addition to PIT tags, we also evaluated electrofishing as a capture method. Typically, muskies aren't sampled well using electrofishing. Their long lateral lines allow them to feel the electrical current before the boat gets close, allowing them to evade us. However, electrofishing at night and implementing a 'spot and stalk' technique has been quite successful! We use a spotlight to see a muskie ahead of the boat and sneak up to them, positioning the booms of the electrofishing boat over the fish before turning the power on and dip netting the fish. Once the fish is removed from the current, we can collect length, sex and maturity information before checking for a PIT tag and implanting one into any new fish. This method has been far more efficient at not only sampling muskies, but especially for larger females that seem to be underrepresented in large frame-trap nets.

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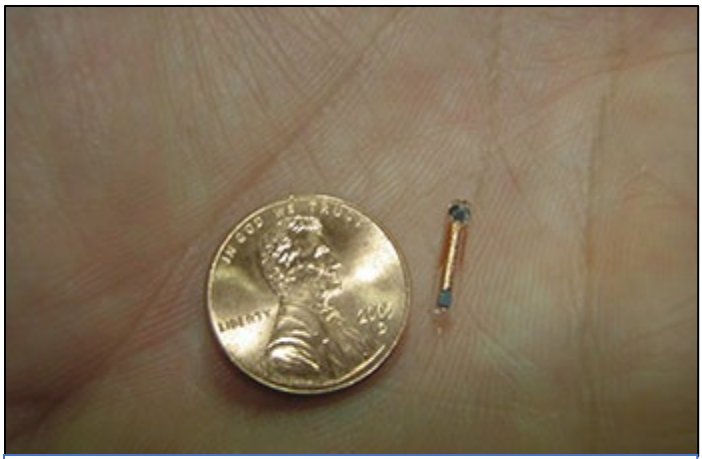

A passive integrated transponder (PIT) tag next to a penny, depicting the small size of these powerful tags.

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To date, we have completed adult (>30 inches) population estimates on Miltona (0.27/littoral acre; a littoral acre is an acre less than 15 feet deep) and Lobster (0.28/littoral acre), and after this spring we will be able to generate an estimate on Oscar. This information has already proven very valuable. Despite stocking Lobster (0.5 fingerlings/littoral acre annually) at twice the rate of Miltona (0.5 fingerlings/littoral acre biennially), they have almost the exact same muskie density, indicating they are both near carrying capacity and the higher stocking rate is not adding to the fishery. Think of it like growing corn, you can double the number of seeds you plant per acre, but you will not double your yield and will be doing so at a higher cost. Similarly, only so much biomass in the lake can be made up of muskies because they need the space and food to be able to survive. With Leech Lake strain muskies, which grow larger than previous strains, paired with a 54-inch minimum length limit, essentially all of our muskie fisheries become trophy fisheries, with fewer but larger muskies.

The stocking of different muskie strains historically in Miltona (Wisconsin and Leech strains) and Lobster (Shoepack, Wisconsin, Iowa and Leech strains) also presented the opportunity to examine the genetics of these populations. The genetics of every strain previously stocked still persist in the population, but both lakes were dominated by Leech Lake strain. Both populations also had approximately 15% mixed ancestry, indicating at minimum 15% natural reproduction and likely higher because pure Leech Lake strain muskies spawning with each other would not be accounted for. Leech Lake strain muskies have been exclusively stocked in Minnesota since the late 1980s, so it is interesting to see these other strains persist in the population.

In the coming years, we will be able to get more precise estimates of natural reproduction, as PIT tagged fingerlings reach sizes where we are more likely to sample them. We will also be able to determine how long muskies are living, how fast they are growing, mortality rates of adult muskies, and how many fish we need to stock to replace them. All of this information will soon be available with some extra effort and the help of a tag the size of a grain of rice.

For information on Lake Miltona muskie diets, see “Fish Diets: What Are They Eating?” In the 2022-2023 Newsletter.

Get Out MORE: Funding for the Outdoors

The Minnesota DNR received a substantial, one time funding from the Minnesota legislature to enhance access to public lands, revitalize camping experiences, modernize boat accesses, enhance fisheries and fishing infrastructure, and restore streams to support outdoor recreation. Referred to as Get Out MORE (modernize outdoor recreation experiences), funding from this initiative will help with several projects in the Glenwood Fisheries Area. Public water accesses at Lake Carlos (West) and Lake Reno (North) will be improved and modernized. In addition, shore fishing opportunities will be created or improved at Lake Ida and Devils Lake. Lake Ida will soon have a fishing pier on the north side of Pilgrim Point County Park, giving shore anglers access to variety of water depths to fish. Devils Lake will receive an improvement to the existing pier within Chippewa County Park by increasing the length of the pier and better access to a prime fishing area. Lastly, three dams will be modified with rock arch rapids along the Pomme de Terre River (see Fragmented Rivers on the first page). After the rock arch rapids are complete, shore fishing sites will be created along the Pomme de Terre River near the existing Crissy Lake Dam site. For more information on other projects across the state see the Get Out MORE webpage.

Walleye Stocking and Fall Assessments

In 2024, Glenwood Fisheries was able to get all of the walleye eggs needed to reach our quota. Our hatchery had excellent hatch rates, allowing us to produce 48.1 million fry. Over 17 million of those fry were stocked directly into area lakes and rivers, while the remaining fry were shipped to other DNR fisheries areas or stocked into rearing ponds. These natural ponds are used to raise walleye to around 5 to 8 inches in the fall before they are netted out and stocked into lakes. We rely on winterkill to clean out our rearing ponds of other fish, reducing competition and predation. For more information about how we choose what to stock, read the articles titled "Walleye Stocking: Fry or Fingerling?" in the 2019-2020 and 2021-2022 Newsletters.

Lake	Number
Agnes	61,000
Amelia	188,500
Andrew	662,000
Ann	150,000
Charlotte	346,000
Chippewa	826,500
Chippewa River	1,000,000
Devils	82,000
Elk	54,500
Emily	1,155,500
Gilchrist	105,000
Graham	69,000
Hattie	200,000
Henry	92,000
Ida	875,500
Johanna	700,000
Lightning	540,000
Long (Stevens Co.)	275,000
Long Prairie River	1,000,000
Malmedal	98,000
Mary	1,644,000
Minnewaska	3,291,000
Mustinka River Flowage	91,000
Osakis	3,389,000
Page	85,000
Smith	182,000
Villard	271,000
Westport	203,000

Number of walleye fry stocked in 2024.

Fisheries staff also conduct fall electrofishing on nine lakes each fall before any fingerling stocking takes place to evaluate fry stocking and natural reproduction. We do this to determine how well walleye fry that hatched in spring have survived to fall, what we call young-of-year (YOY) fish. We use this as an index to estimate how many walleye should be recruiting to harvestable size fish in the coming years. These surveys have occurred on most of these nine lakes since the early 1990s, so we have many years of data. While the catch rates were record breaking on some lakes in 2022 and 2023, the fall of 2024 was more moderate. This is not unusual, as walleye populations typically have large year classes every few years, and competition can limit the survival of consecutive year classes. The strong 2022 and 2023 year classes will provide excellent opportunities for catching 'eater size' walleye for the next few years.

Lake	Number	Lbs.
Aaron*	4,500	200
Barrett*	5,100	170
Brophy	2,460	164
Brophy*	1,375	55
Burgen	1,764	94
Carlos	7,060	816
Carlos*	5,000	250
Cowdry	415	47
Cowdry*	1,350	50
Darling	11,545	554
Freeborn*	960	120
Geneva	4,425	295
Geneva*	2,250	225
Ida*	22,500	750
Indian	133	70
Irene*	14,400	480
Latoka*	6,456	538
Le Homme Dieu	6,616	1,379
Le Homme Dieu*	700	100
Linka	416	64
Little Chippewa*	4,440	148
Lobster*	7,560	252
Long* (Douglas Co.)	6,060	202
Louise	104	54
Maple	6,577	405
Mill	5,880	392
Miltona*	30,000	1,000
Mina	671	316
Minnewaska*	31,340	2,000
Moses*	6,000	300
Osakis*	16,148	1,000
Oscar	20,920	1,241
Pomme de Terre*	9,525	318
Red Rock*	6,000	200
Signalness (Mountain)	356	82
Stowe	1,202	794
Union	1,140	57
Victoria	2,351	131
Victoria*	1,310	131
Whiskey	65	13
Whiskey*	2,190	73

*Number and pounds of walleye fingerlings and yearlings stocked in 2024. *Indicates fish purchased and stocked by private citizens or sporting groups.*

Aquatic Invasive Species

Aquatic invasive species (AIS) continue to be a problem statewide. Approximately 70% of our publicly accessible waters within the Glenwood Fisheries Management Area contain at least one AIS. Aquatic invasive species are moved from infested to non-infested waters by anglers, boaters, and lake shore owners and can adversely affect lakes and fish populations. To avoid spreading AIS, lake users are required to remove all aquatic plants and animals from their watercraft, and drain all water from their boat and motor before leaving the access. If you suspect an infestation of an invasive species in a lake, save a specimen and report it to a local DNR office.

Zebra mussels attached to a boat lift.

In 2024, two new lakes in the Glenwood Area were confirmed to contain zebra mussels: Grove Lake in Pope County, and Freeborn Lake in Douglas County. For a full list of lakes, see the infested waters list. Additional information on AIS can be found on the DNR website (https://www.dnr.state.mn.us/invasives/ais/index.html).

Lake Surveys

Lake surveys are the primary tool for guiding fish management. Our standard lake survey consists of trap nets, gill nets and electrofishing. Electrofishing is conducted in the spring to target bass, while gill nets sample offshore fish (e.g., walleye, northern pike and yellow perch) and trap nets sample nearshore panfish (e.g., bluegill and black crappie). Nets are checked and moved daily for about a week on each lake. Placing nets in the same locations within a lake each survey, and surveying over many years, allows us to track trends in fish populations. Survey information can be accessed by going to https://www.dnr.state.mn.us/lakefind/index.html and typing in the lake of interest.

Standard Lake Surveys 2024

The following lakes were sampled in 2024:

Andrew	Carlos	Cottonwood
Darling	Geneva	Mill
Rachel	Smith	Victoria
Scandinavian	Le Homme Dieu	

Standard Lake Surveys 2025

The following lakes will be sampled in 2025:

Amelia	Big Chippewa	Burgen
Cowdry	Indian	Leven
Little Chippewa	Lobster	Maple
Mary	Red Rock	Pelican (Grant Co.)
Stowe	Villard	

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