

2023 Lewis and Clark Lake Fish Sampling Summary

Nebraska Game and Parks Commission

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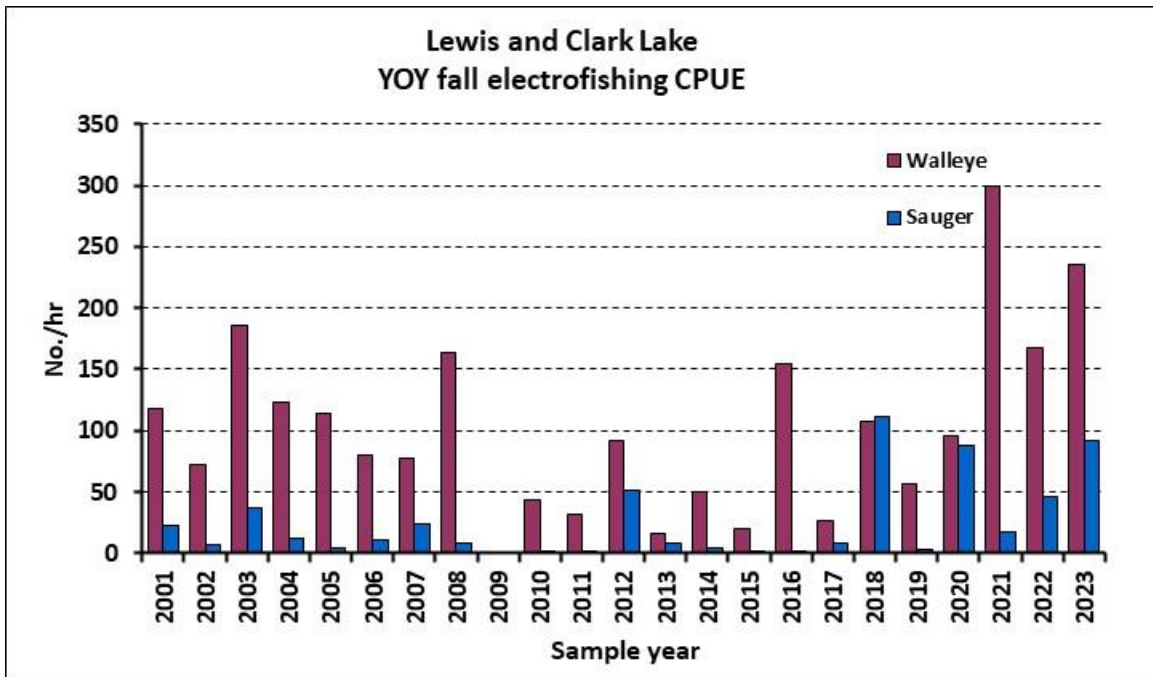
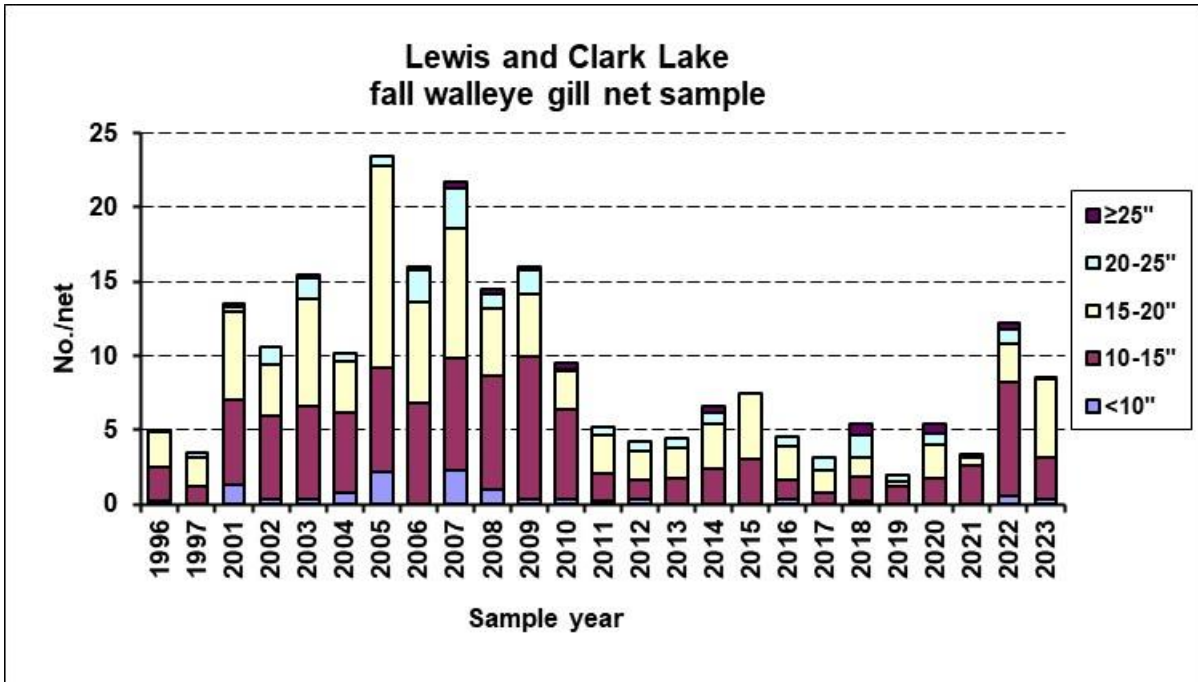
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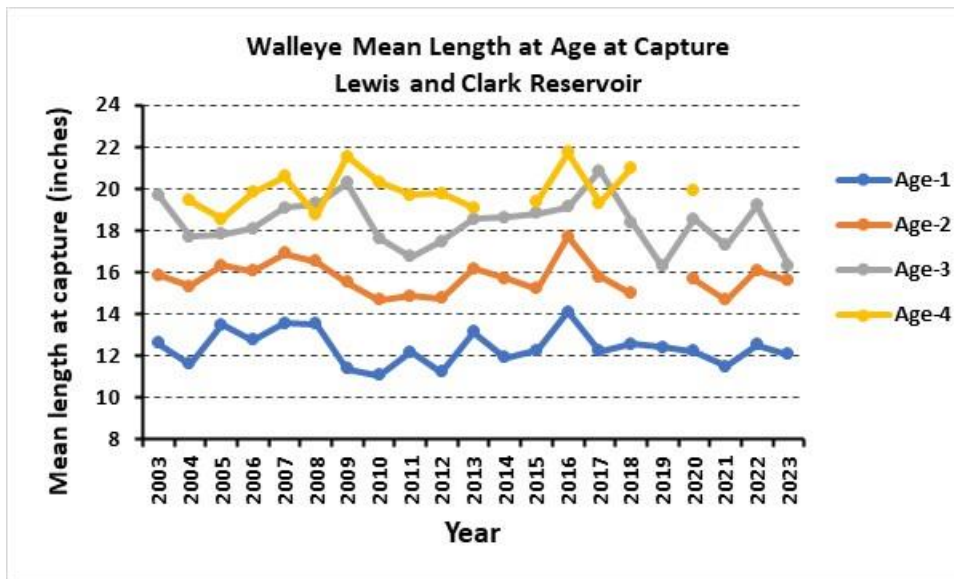
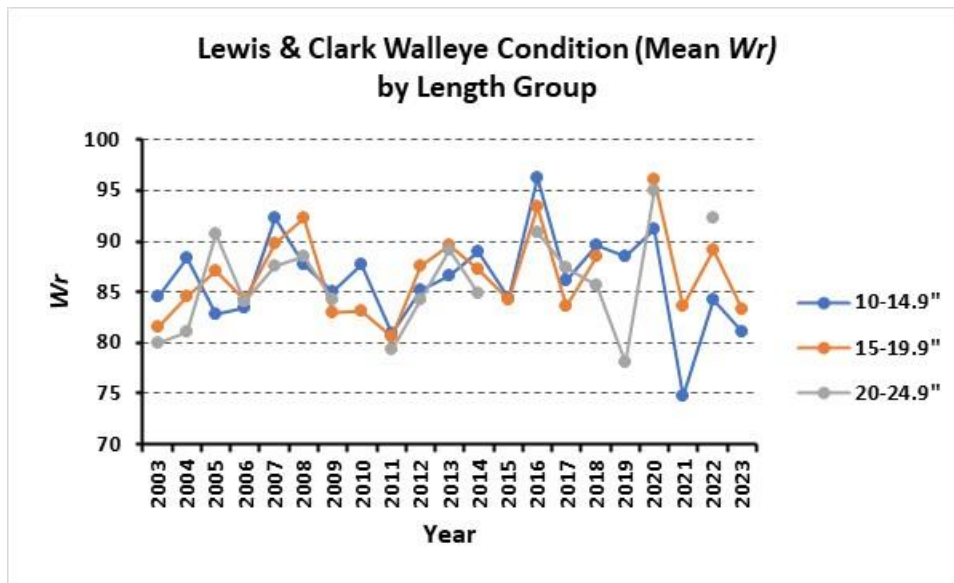


The following text and graphs summarize data from the fall fish survey on Lewis and Clark Lake. Night-time electrofishing for young-of-the-year (YOY) was conducted on September 26 and 27 and gill netting occurred on September 26. Sampling consisted of one hour, 45 minutes of night-time electrofishing and 5 gill nets. Gill nets targeted walleye, sauger, white bass, and channel catfish while electrofishing was used to monitor abundance of YOY walleye, sauger, and white bass as an index of 2023 production and assess stocked fish contribution. Both sampling methods are normally conducted on an annual basis. Historical data has shown that periods of high flows through the dam typically correspond to lower abundance of walleye in the reservoir. As a limited example, through the ten-year period from 2001-2010 the mean outflow was 19,770 cfs with a corresponding mean catch rate of 15.1 walleye/gill net while during the ten-year period from 2012-2021 the mean outflow was 30,070 cfs and the mean catch rate was 4.6 walleye/gill net. Walleye and sauger angling success improved on the reservoir proper in 2023 and was evident from the angling pressure observed this fall. Fishing the chutes at the upper end of the lake and the riverine portion upstream were also worthwhile endeavors in 2023 as anglers also saw success in those areas. White bass fishing remained lackluster, but catfishing opportunities continued their positive trend.

Walleye

Walleye angling opportunity should be decent once again in 2024. The walleye catch rate declined a bit compared to the 2022 catch but legally-harvestable fish made up 65% of the sample. However, the lake did receive a substantial amount of angling pressure after our fall gill net survey so time will tell the impact that had on opportunities for 2024. It has been a while since that kind of fall angling pressure was observed on Lewis & Clark. The strong 2021 year class once again comprised the majority of the sample (51%) and accounted for many of those harvestable fish in 2023. The 2022 year class was decently represented in the sample also and should bolster angling opportunities over the upcoming year. Quality walleye angling opportunities are expected to continue since our YOY sampling indicated strong year classes being produced in each of the last three years. However, it will be highly dependent on flows through the system remaining relatively low. Moderate to high catch rates of YOY walleye had not been equating to an increased adult population in the reservoir for several years following 2011, most likely due to the high flows during that period. However, now three consecutive years of relatively low releases through the dam appear to have provided conditions for more of those fish to stay in the reservoir. Graphs and discussion later in this report provide some background on the relationship between dam releases and walleye numbers. The walleye in the reservoir have exhibited variable condition over the years and the condition indices (mean Wr) of fish collected in the fall of 2021 indicated that they were in poor shape. Fish condition improved in 2022 but dropped off again somewhat in 2023 which appeared to influence reduced growth rates, most notably growth of the age-3 fish which are probably in the upper end of the 15-19.9" length range. Despite the reduced growth rates, most walleye continue to reach legal harvestable size (15 inches) in their third growing season.

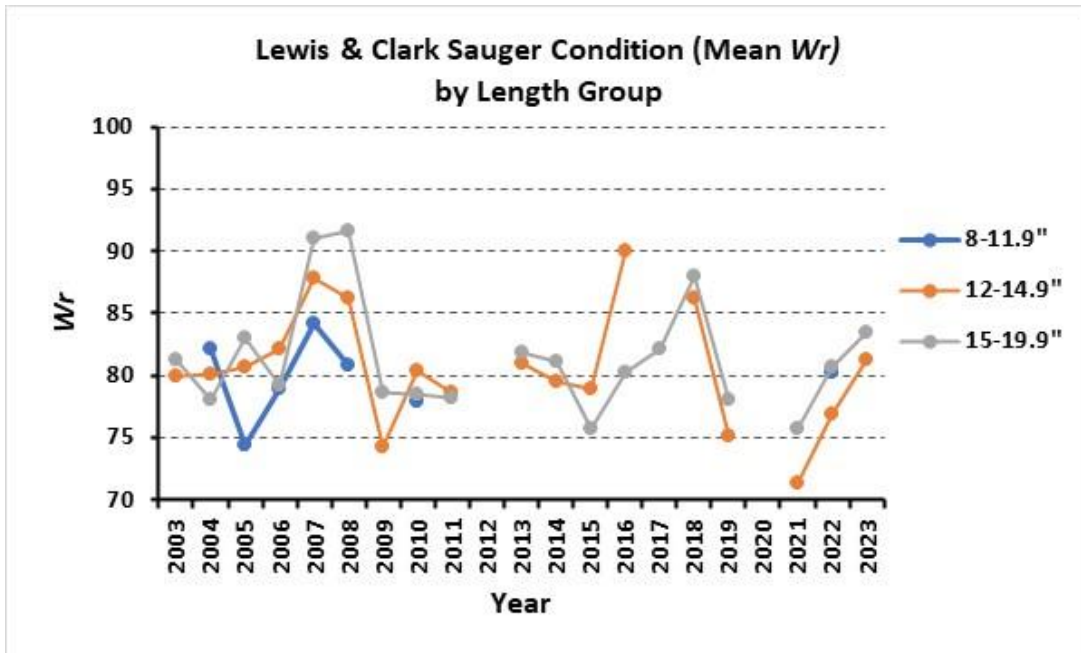
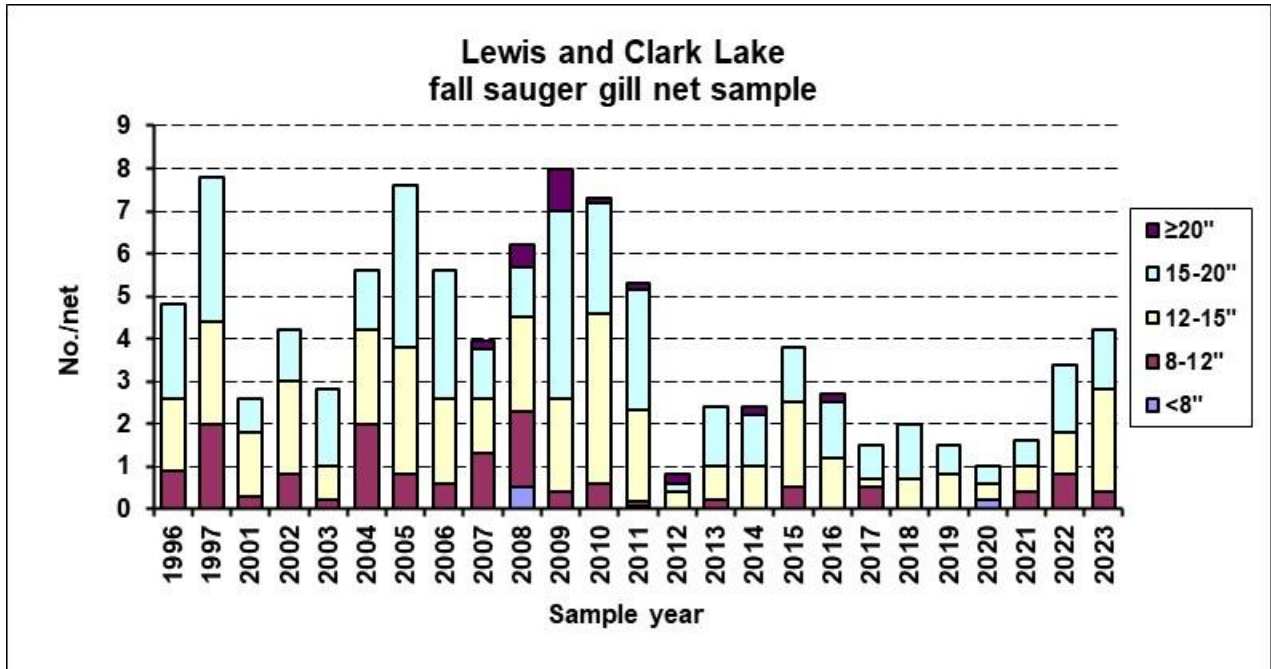




Sauger

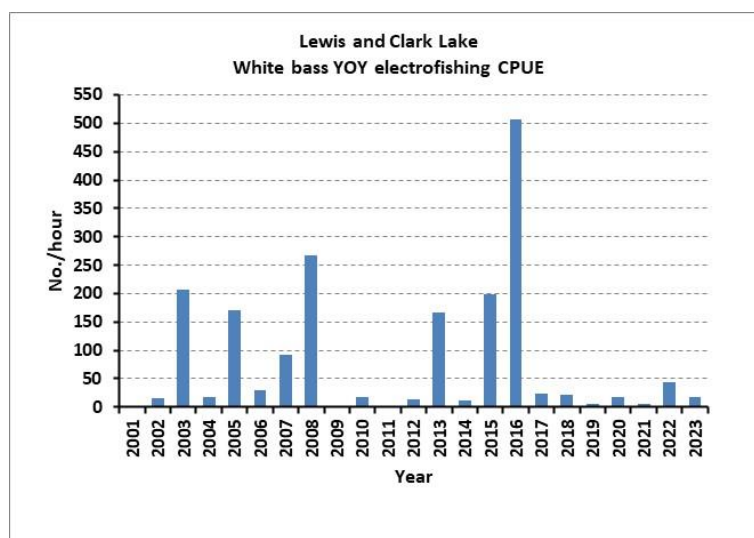
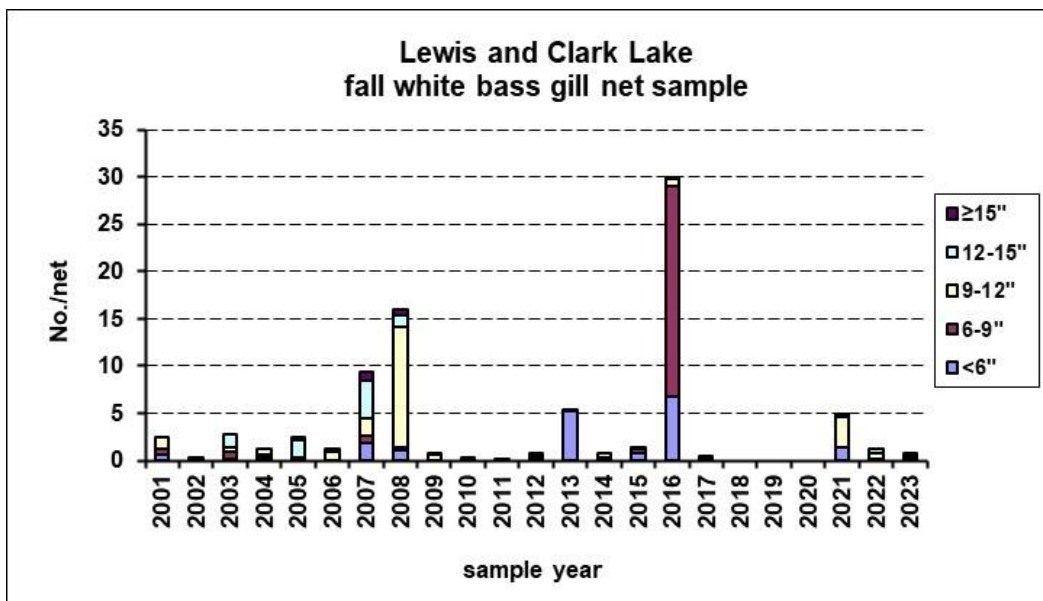
In contrast to the walleye, the sauger catch rate improved by almost a fish per net in 2023. Four year classes of sauger made up the sample and 33% was comprised of harvestable fish (≥ 15 inches). Strong year classes have been produced in four out of the last six years and, although not seemingly affected by flows as much as walleye, continued reduced flows may also keep more sauger in the reservoir to recruit to the fishery. Sauger exhibited concerning condition in 2021 but seemed to have found better food supply over the last two years with relative weight (*Wr*) values improving each year. Sauger growth rates did slow a bit on larger fish but analysis indicated that most of them continue to reach 15 inches in length in their 3rd growing season. Sauger are more adapted to flow than walleye and often provide some good angling opportunities in the delta portion of the reservoir. This area, often referred to as the “chutes”, is in the vicinity of Springfield, SD and Santee, NE.

Considering the production in the system over the last few years (indexed with the fall YOY sampling), angling may prove to be quite good in that area in 2024. The riverine stretch upstream of the delta also provides good angling opportunities for sauger (and walleye).



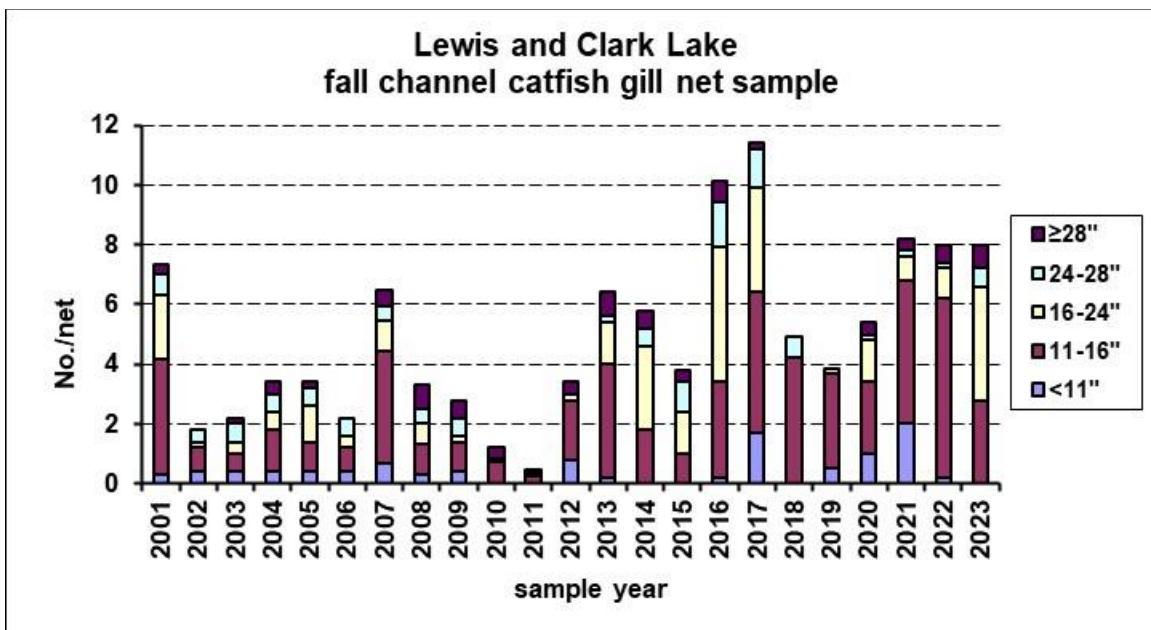
White Bass

White bass catch remained low in Lewis & Clark but it has been good to at least see some white bass in the survey after three consecutive years of no observations between 2018 and 2020. It is important to keep in mind that, as has been discussed before in this report, the low number may not be completely representative of the population because white bass can be inherently difficult to sample due to their schooling nature (being very “hit or miss”). Anecdotally, this is evident when looking at the gill net catch rates from 2001 to present. Sampling resulted in a catch of at least 5 white bass per net only five times in those 23 years with two of those times (2013 and 2016) being made up of age-0 fish almost exclusively. Despite low gill net catch rates in those other years, the white bass fishing was quite phenomenal in some of them. Growth rates have typically been excellent in the reservoir, producing great angling opportunities for white bass over 12 inches, and even exceeding 15 inches, when the fish are present. The reduced flows through Gavins Point Dam over the last three years may provide for better retention of fish within the reservoir and improve white bass opportunities. There were some reports of anglers catching some harvestable fish in the latter part of 2023.



Channel Catfish

Channel catfish catch rates were consistent over the last three years and relatively high over the last decade compared to pre-2012 numbers. Size structure had been less than desired in recent years but with many of those fish growing and recruiting to larger sizes, the length distribution appeared greatly improved in 2023. Often overlooked by fishermen, catfish are fun to catch and possess good fighting ability and 2024 will be a great time to pursue catfish in Lewis & Clark. The reservoir will not only provide some great opportunities for those who like to harvest some of those “pan-size” fish for a meal but also to catch some larger fish. In addition to the reservoir, the delta and river upstream provide some very good catfish angling opportunities.

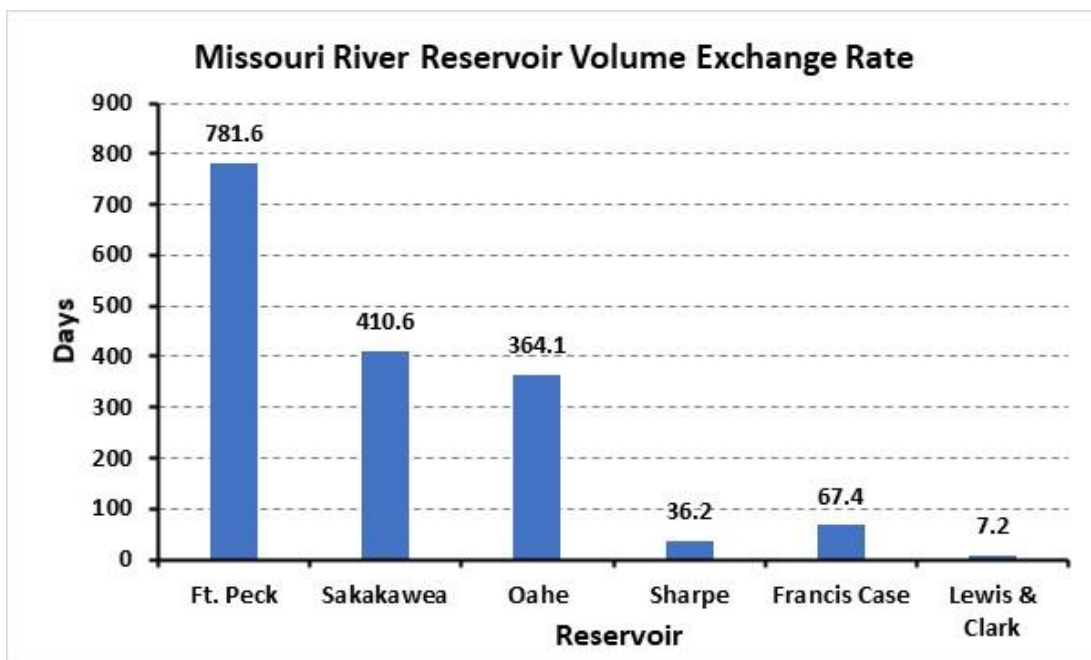


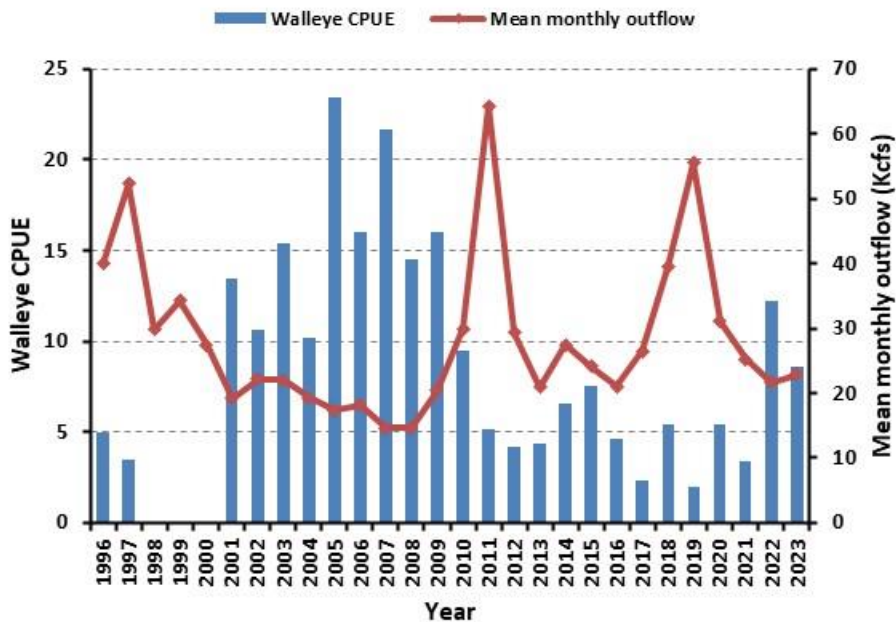
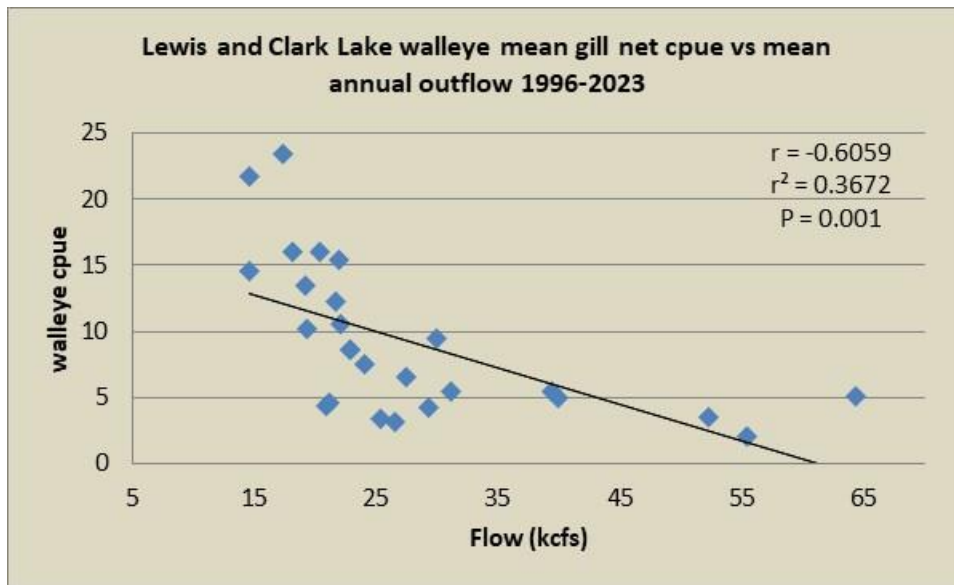
Other Species and Information

Although no data is presented in this summary report, other species available for anglers to catch in Lewis and Clark include abundant smallmouth bass along with some opportunities for largemouth bass, crappie, bluegill, and northern pike. Smallmouth bass are found throughout the lake and river system, usually associated with rock structure, both natural and man-made. Crappie are typically caught in the bays around the lake, in the delta backwaters, and around docks in the marinas. Bluegill can be caught along rock areas or in the stands of vegetation in the bays and other protected areas that are present in the reservoir and northern pike provide an occasional catch throughout the system.

Any discussion of the fishery in Lewis and Clark Lake quickly turns to flows through Gavins Point Dam and turnover time in the reservoir. Fish of all species are highly vulnerable to escapement or flushing through the dam into the tailwaters. This is a one-way trip since fish cannot get back upstream to the reservoir. The complete barrier is a very good thing to contain the ever-growing invasive carp populations found below Gavins

Point Dam and keep them from getting into the lake and river systems above. However, the barrier can lead to depressed sport fish populations in the reservoir if flows and escapement are too high. Consider the adjacent charts. The exchange rate, also known as turn-over time, for Lewis and Clark Lake is very short, especially when compared to the other Missouri River reservoirs. This means a high flow-through at the dam that can lead to high fish escapement. This phenomenon is depicted in the relationship between mean walleye gill net catch-per-unit-effort and mean annual outflow from Gavins Point Dam (mean annual outflow in cubic-feet-per-second). The analysis indicates a significant negative relationship. In other words, the higher the outflow through the dam, the lower the walleye numbers in our reservoir samples. The less the outflow the higher the walleye numbers. This would likely apply to other species such as white bass also. Some species are more prone to entrainment/escapement than others with walleye and white bass being top candidate species for this downstream movement. This relationship, while not accounting for all variability in walleye numbers, is a major part of the equation. In the mid- to late-2000's the average flow through the dam was less than 20,000 cfs for five consecutive years. Consequently, sampling during that period produced the highest catch rates observed through our sampling history on the reservoir. Flows through the dam had been relatively high most years since that time, but reduced flows over the most recent three years appeared to have equated to much improved catch rates in 2022 and 2023.

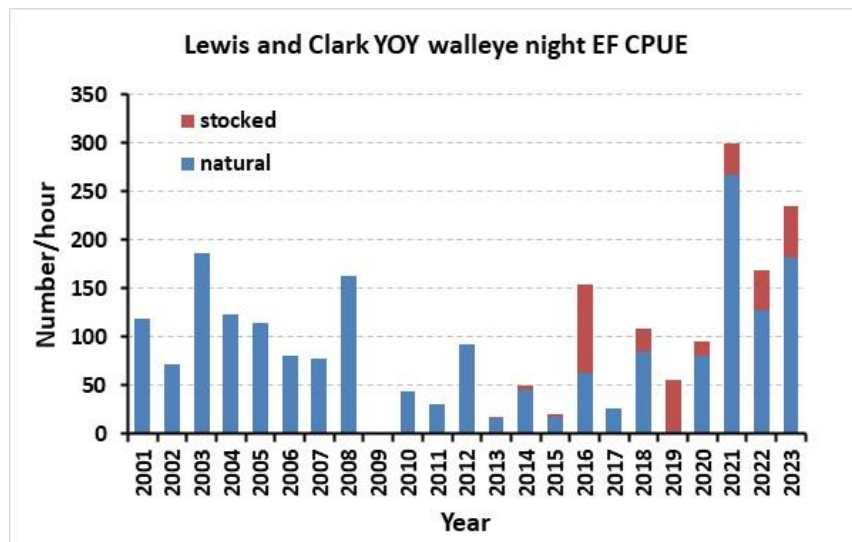
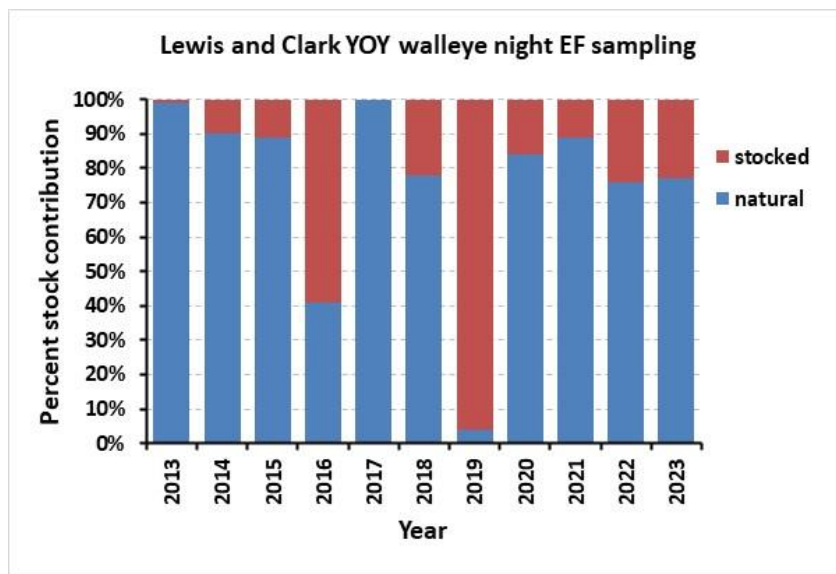




Additional evidence of walleye movement out of the reservoir and through the dam can be found in the evaluation of the various walleye stockings which utilized marked fish. Annual walleye stocking was initiated in 2014 to address the low walleye numbers the reservoir following the 2011 flood. The walleye stocked over that time period have been marked with oxytetracycline (OTC) which allowed us to evaluate not only the contribution of stocked fish to the reservoir population but also document movement of the stocked fish. Walleye stocked above Gavins Point Dam have comprised up to 69% of the young-of-the-year walleye collected below the dam in sampling conducted from 2016 to 2023. These stocked fish are not “lost” but will contribute to the fishery in the river below Gavins Point Dam. Rather, this just illustrates the difficulty in keeping fish in the reservoir proper in a high turn-over, open system.

Stocking Evaluation & Research

Walleye stocking efforts in Lewis & Clark prior to 2011 were limited to some “initial” stockings following the closure of Gavins Point Dam and a two-year period in the mid-1980’s. The walleye fishery had otherwise been maintained through natural reproduction and recruitment. However, annual walleye stockings were initiated in 2014 (exception: no stocking in 2017) in an attempt to address the low walleye numbers being observed in the reservoir since the major flood year of 2011. As mentioned earlier in this report, all stocked fish have been marked with OTC to allow for stock contribution analysis. Fry stockings were attempted from 2014 through 2016 but proved relatively unsuccessful with stock returns ranging from <1% to 11% for those 3 years. In 2016, South Dakota Game, Fish, and Parks (SDGFP) stocked 1.4 million fingerlings in addition to Nebraska’s fry stocking. That fingerling stocking proved much more successful comprising 50% of the 2016 walleye young-of-the-year (YOY) sample that year. Due to the success of the fingerling-stocked fish, fry stocking efforts were abandoned and only fingerlings have been stocked since.



Year	Number	Size	Source	In-lake YOY Contribution
2014	14,107,500	Fry	NE	<1%
2015	12,800,000	Fry	NE	11%
2016	13,449,865	Fry	NE	8%
2016	1,400,000	Fingerling	SD	51%
2018	1,047,446	Fingerling	NE	22%
2019	1,819,269	Fingerling	NE	96%
2020	953,360	Fingerling	NE	16%
2021	536,972	Fingerling	NE	8%
2021	356,564	Fingerling	ND	1%
2022	2,101,511	Fingerling	NE	24%
2023	1,006,819	Fingerling	NE	23%

Walleye fingerlings have been stocked at the upper end of the reservoir between Springfield, SD and Charlie Creek on the South Dakota side in most years. Exceptions were in 2018; when they were stocked at several locations including the Fort Randall Tailwaters, Running Water boat ramp, and the upper end of the reservoir, and 2021; when about 40% were stocked at Verdel and the remainder at Springfield. Stocked fish contributed a substantial proportion to the YOY catch in 2016 and 2019 while other years they comprised less than 25% of the catch. Despite seeing high stock contribution in those two years and good to excellent YOY catch rates during fall sampling in multiple years, increased gill net catch rates of adult walleye in subsequent years had not occurred in most years following 2011. However, analysis by SDGFP staff of older fish collected on Lewis & Clark Lake indicated that 50% of age-2 walleye collected in 2021 were stocked fish and that 22% of age-1 walleye collected in 2023 were stocked fish. Those 2-year old walleye collected in 2021 would have been from the high stock contribution year (96%) of 2019. Thus, the data suggest that stocking seemed to, at the very least, help maintain the low-density walleye fishery that had been present in the reservoir through some of those high-flow years. However, entrainment/escapement appears to be the overall driver on adult walleye abundance in the reservoir with stocking having little overall influence on increasing said abundance. Additionally, stock contribution has been relatively low in six of the eight years that fingerling stocking has occurred.

The stocking efforts and mark analysis are a combined effort between the Nebraska Game and Parks and South Dakota Game, Fish, and Parks (SDGFP). After considering the strong natural walleye production over the last three years and somewhat limited contribution by stocked fish most years, it was decided by both agencies to forego walleye stocking in the reservoir in 2024. Should stocking occur in the future, stocked fish will likely be marked so that their contribution can be assessed.

Future/Ongoing Research-Movement Study

Additional research initiated in 2021 will continue through 2024. SDGFP is the lead on a tagging project monitoring movement of walleye and sauger in the Missouri River system downstream of Ft. Randall Dam, primarily between Ft. Randall Dam and Gavins Point Dam. The University of Nebraska at Lincoln has a graduate student (Will Radigan) on the project and NGPC is also involved. Walleye and sauger have been collected from this reach over the last several years and implanted with acoustic transmitters. The transmitter is placed in the body cavity and thus is not visible to the angler. However, all fish implanted with transmitters have a metal tag placed on their upper jaw so that they are identifiable externally. It is preferred that these fish be released if caught but the angler can certainly harvest it if desired. If the harvest route is chosen, please contact Will or the fisheries personnel in the Norfolk district office (see contact information at the end of this report) as we would like the transmitter back to implant in another fish. The walleye and sauger movement is being monitored by a system of receivers, installed at multiple locations in the river reach and in Lewis & Clark Reservoir, that detect the implanted fish as they pass by them. Among other things, this study will provide movement data including where the adult walleye and sauger that spend time in this stretch of the Missouri River system are ending up; whether it be somewhere between the dams, harvested by anglers, or entrained through Gavins Point Dam. Will is also monitoring entrainment rates of larval fish through both Ft. Randall and Gavins Point dams. Walleye and sauger entrainment rates have been relatively low thus far, likely due to the reduced flows over the project time period.

Zebra Mussels and Invasive Species

Anglers and recreational boaters should continue awareness for zebra mussels while using Lewis and Clark Lake and the Missouri River. Zebra mussels were found in Lewis and Clark Lake in 2014 and their numbers increased exponentially in subsequent years. Their abundance appeared to decline somewhat in 2019 and 2020 but exploded again in 2021 and have been considerably high since. As discussed in previous versions of this report, they are likely at the point where they are fully established in the system and their population will oscillate from year to year, some years like 2021 with extremely high abundance and others like 2019 and 2020 when low abundance made them barely noticeable. Despite those visibly reduced adult numbers in 2020, plankton net tows conducted around the lake that year still indicated detectable numbers of veligers, the **microscopic** larval stage of the mussel. Lake water containing veligers can be pumped into livewells and outboard motor cooling systems, used to fill bait buckets, spilled in a boat, etc. and potentially result in 1) zebra mussels being unknowingly transferred to another waterbody or 2) them attaching to and growing in the watercraft and/or boat motor and causing various mechanical issues.

South Dakota Game, Fish, and Parks (SDGFP) discovered zebra mussels in both Lake Sharpe and Francis Case Reservoir in 2019 and Oahe in 2023. Additionally, NGPC observed **high** numbers of adult zebra mussels on samplers at the Verdell and Santee boat ramps in 2021, both being locations where they had never been observed prior. Thus, anglers who fish **any** stretch of the Missouri River need to be extra diligent with the Clean, Drain, and Dry protocol prior to leaving associated areas in order to control the spread of zebra mussels. Invasive mussels have also been documented in several other neighboring states including Iowa, Kansas, and Missouri. Zebra mussels are certainly not the only invasive species in Nebraska, or in Lewis and Clark and the Missouri River, so please be diligent and not only drain all water from your watercraft, buckets, etc. but also remove any vegetation. Zebra mussels have been observed attached to vegetation in Lewis & Clark so boaters leaving the lake must be diligent about following decontamination protocols. The water has cleared substantially in Lewis & Clark recently and dense vegetation, including the invasive Eurasian watermilfoil, has

become an issue in certain areas, most notably in the bays with boat launch facilities. Inadvertent transfer by humans is the major source of new infestation for zebra mussels and other invasives, primarily by boats, boat trailers, and fishing gear. Anglers and boaters are encouraged to educate themselves on these and other aquatic invasive species. An excellent source of information regarding invasive species can be found on the University of Nebraska's Invasive Species Project website: <http://www.neinvasives.com>. **Regulations that took effect in 2013 mandate that all vessels and conveyance be drained of water prior to entering or leaving a lake to prevent the spread of invasive species. This means all livewells, baitwells, and boat hulls shall be drained and free of water. Additionally, all aquatic vegetation must be removed from boats and trailers prior to leaving a lake. Boats are subject to inspection by authorized personnel. Regulations will be strictly enforced. Remember to bring ice on your trip to transport your fish home. All non-resident boats (those not registered in Nebraska) must have a non-resident AIS sticker affixed to the hull prior to launching at Nebraska boat ramps.**

NONRESIDENT AQUATIC INVASIVE SPECIES STAMP

Motorized watercraft registered outside of Nebraska are required to purchase and display an Aquatic Invasive Species Stamp (image on bottom right) before launching from any Nebraska boat ramp.

- The fee for the decal-like stamp is \$18, which includes a \$3 issuing fee.
- The stamp can be purchased at OutdoorNebraska.org, at Commission offices (see list on page 2), or authorized permit agents.
- At the time of purchase, the purchaser will receive a valid temporary permit. The actual stamp will be mailed within 10 business days.
- The stamp is required annually.
- The stamp must be permanently affixed to the starboard and rearward side of the boat, on the outside of the hull above the water line. (See image on bottom left.)



*****Boat inspections and zebra mussel sampling will continue at Lewis and Clark Lake, the Missouri River, and other waterbodies in the state in 2024. We ask for your cooperation and patience in the boat inspection effort and ask for your assistance in stopping the spread of zebra mussels and other invasive species such as Asian carp, Eurasian watermilfoil, rusty crayfish, red swamp crayfish, etc. All these invasives are found in the Missouri River below Gavins Point Dam.**

For more information on fishing rules and regulations visit the Nebraska Game and Parks website at OutdoorNebraska.org.

For more information on the fisheries at Lewis & Clark Reservoir contact:

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