2019 Lewis and Clark Lake Fish Sampling Summary

Nebraska Game and Parks Commission

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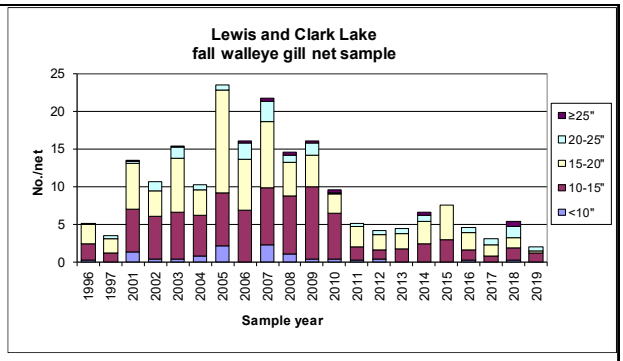
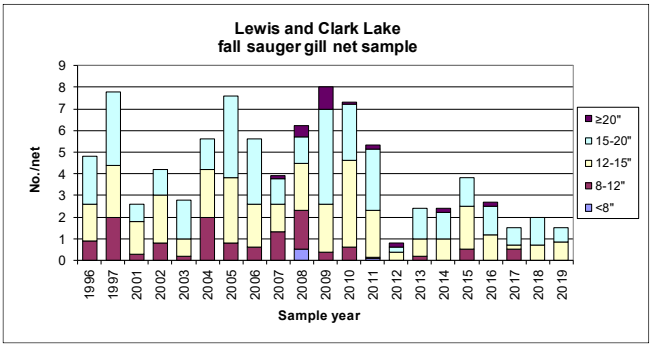
The following text and graphs summarize data from the fall fish survey on Lewis and Clark Reservoir. Night-time electrofishing for young-of-the-year (YOY) and gill netting was conducted from October 2-24, 2019. Sampling consisted of 6 gill nets and 2 hours of night-time electrofishing. Gill nets targeted walleye, sauger, white bass, and channel catfish and the electrofishing was used to monitor abundance of young-of-the-year walleye, sauger, and white bass as an index of 2019 production. Both sampling methods are normally conducted on an annual basis.
Historical data has shown that periods of low flows through the dam have corresponded to higher abundance of walleye in the reservoir. That certainly hasn't been the case in recent years as the average releases through Gavins Point Dam were the 6th and 2nd highest on record in 2018 and 2019, respectively. Walleye and sauger angling success was limited in 2019 but the anglers who know the lake and fish the "chutes" at the upper end of the lake once again had good success at times. White bass angling was quite limited in the reservoir but was decent in the Gavins Point tailwaters.

Walleye

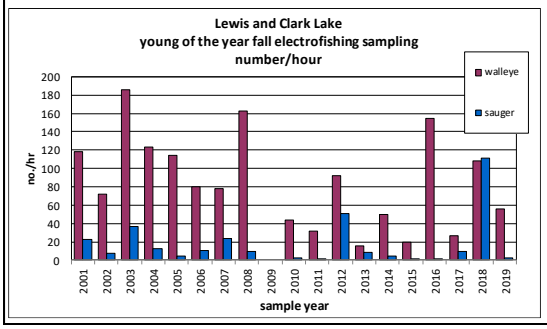


Walleye numbers really dropped off in 2019 and the gill net survey indicated the lowest catch rate since the mid-1990's. Walleye catch rates have been relatively poor since the flood of 2011. The 2018 year class comprised most of the walleye sample (60%) and averaged about 13 inches in length. That, coupled with the low overall catch rate, indicated a low number of harvestable-size walleye available to anglers fishing Lewis & Clark. Research and supplemental stocking have been conducted in recent years to try to understand and address the low walleye numbers in the reservoir. These activities will continue over the next several years. High flow and associated releases from Gavins Point Dam and suspected habitat changes following the 2011 flood are considered to be the likely factors limiting walleye recruitment in the reservoir. Graphs and discussion later in this report provide some background on the relationship between dam releases and walleye numbers. The period of high walleye numbers, 2001 through 2009, coincided with low flows through Gavins Point Dam (average=18,600 cfs mean monthly outflow). Conversely, from 2012 through 2018 the average flow for the period was approximately 27,000 cfs and there were no single years in the period with average flows less than 20,000 cfs. Sporadic good fishing occurs below Gavins Point Dam and areas downstream as these areas are basically "stocked" from Lewis and Clark Lake due to movement of fish out of the reservoir, especially during high-flow through years. Growth rates have slowed recently but data indicate that in most years walleye tend to reach legal harvestable size (15 inches) in their third growing season.

Sauger

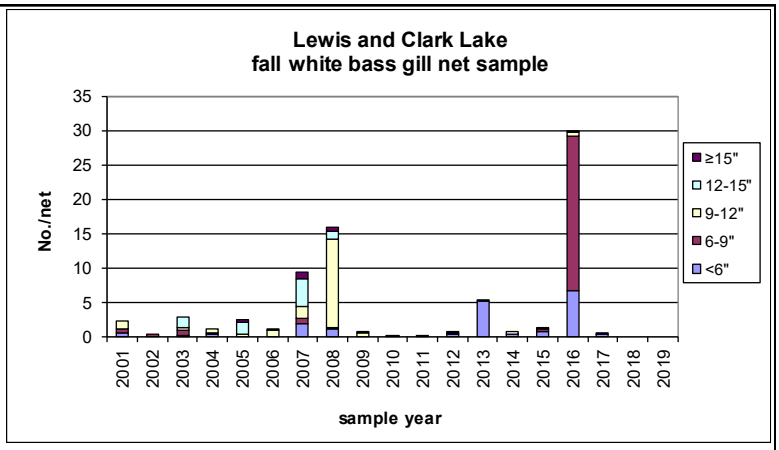


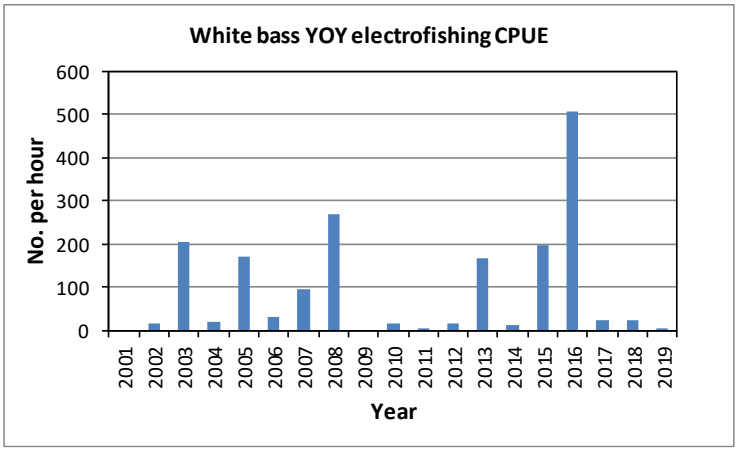
Sauger catch was low once again in 2019 which continued the trend of low net catches following the 2011 flood. The mean net catch from 2012 to 2019 was 2.1 compared to 6.2 for the period 2004 to 2011. Some of the historical sauger spawning habitat was greatly altered by the high flows in the Niobrara and Missouri rivers which may negatively influence future sauger production in the system. Similar to walleye, sauger growth rates have been on a declining trend. However, growth analysis indicated they still averaged 15 inches or more through three growing seasons. The high young-of-the-year sauger catch in 2018 didn't seem to equate to higher abundance in 2019. Considering the high flows of 2019, they may be contributing to the river fishery below Gavins Point Dam. However, they are adapted to flow more so than walleye so they could be more prone to inhabiting the delta portion of the reservoir where sampling just hasn't occurred. This area, often referred to as the "chutes", runs from Santee to downstream of Springfield, SD, and normally provides some of the best angling opportunity for sauger associated with Lewis and Clark Lake. The riverine stretch upstream of the delta has also provided good angling opportunities in the past.



White Bass

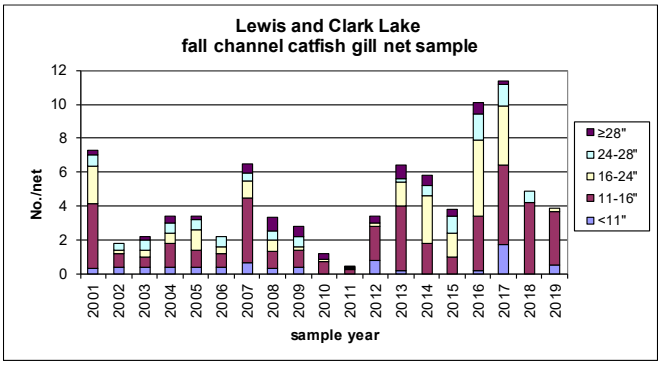
It's difficult to say much about the white bass in Lewis & Clark in 2019. They can be inherently difficult to sample due to their schooling nature, being very "hit or miss". As can be seen in the graph, even in the years when there have been good numbers of them in the reservoir it is rare to see a catch rate over 5/gill net. Although they weren't collected during our surveys over the last three years there were reports of some good localized fishing for them in 2017 and 2018. However, not much was heard about white bass angling success on the lake in 2019. White bass numbers are likely very low reservoir-wide but, as in recent years, they may produce some localized opportunity in the lake. Growth rates have typically been excellent in the reservoir so if anglers are able to find them they should see some nice fish. Most of what was left of the strong 2016 year class, and any subsequent recruitment, is likely downstream of Gavins Point Dam following two consecutive years of very high flows. White bass fishing was pretty good below the dam at times in 2019 and that will likely be the case again in 2020.





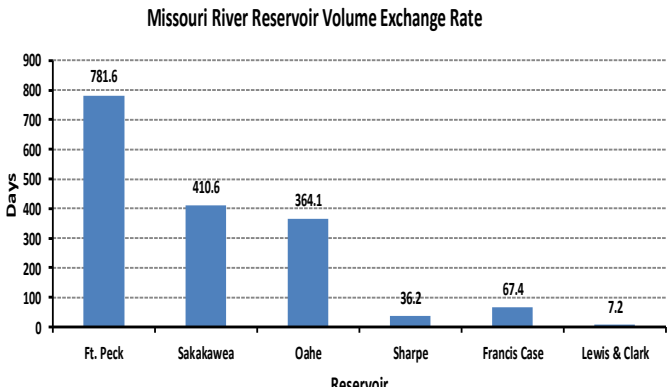
Channel Catfish

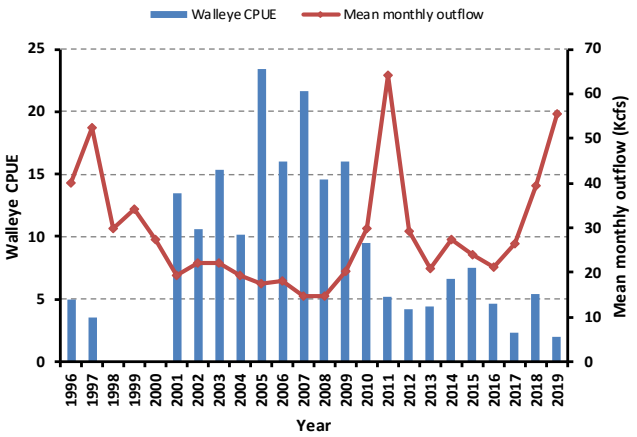
Contrary to the other priority game fish populations in the reservoir, channel catfish catch rates in Lewis and Clark were once again noticeably higher after the big flood year as compared to pre-2011. Troubling however, is that fish over 16 inches were virtually absent from our sample once again. That's two consecutive years of not seeing those larger fish that have made up a fair portion of the population since 2013. Keep in mind though that 2019 was the second-highest flow year in the history of the dam which could have influenced catfish activity. 2018 was also a top-ten flow year. It appeared that decent recruitment has occurred in recently and fish should move up to those larger size classes over the next several years. Catfish should provide decent catch rates in 2020 but smaller fish will likely dominate the catch. Often overlooked by anglers, catfish are fun to catch and possess good fighting ability. Fishing for channel catfish near the mouths of tributaries following a runoff event can provide good action.



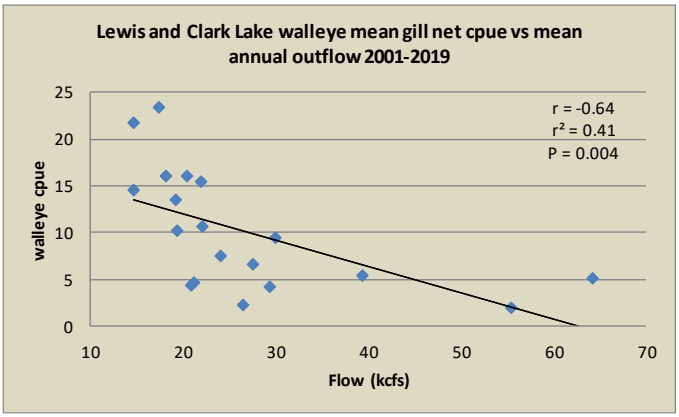
Other Species and Information

Although no data is presented in this summary report, other species available for anglers to catch in Lewis and Clark include abundant small-mouth bass along with some 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 while bluegill can be caught along rocked areas or anywhere one might find stands of vegetation in protected areas such as bays and behind the breakwaters that are present in the reservoir. Northern pike can provide an occasional catch anywhere in the system.



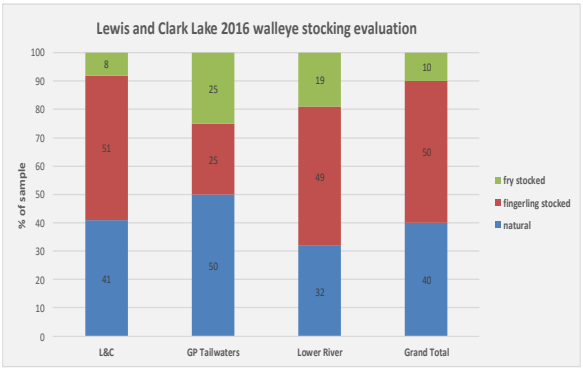


Any discussion of the fishery in Lewis and Clark Lake quickly turns to flows through Gavins Point Dam and turnover time in the reservoir. Fish of all species are highly vulnerable to escapement or flushing through the dam into the tailwaters. This is a one way trip since fish cannot get back upstream to the reservoir. The complete barrier is a very good thing to contain the ever growing Asian Carp population found below Gavins Point Dam and keep them from getting into the lake 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 can also be applied to other species such as white bass. Some species are more prone to entrainment than others with walleye being a 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 a five consecutive year period. Consequently, sampling during that period produced the highest catch rates observed through our sampling history on the reservoir.

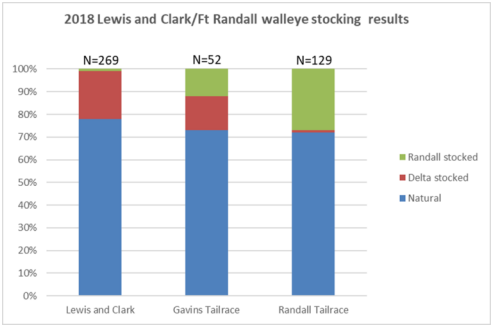


Additional evidence of walleye movement out of the reservoir and through the dam can be found in the evaluation of the 2016, 2018, and 2019 walleye stockings which utilized marked fish. The walleye stocked in those years were marked with oxytetracycline (OTC) which allowed us to evaluate not only the contribution of stocked fish to the reservoir population but also the movement of the stocked fish. Walleye stocked between Ft. Randall Dam and Gavins Point Dam comprised ≥50%, 27%, and 69% of the young-of-the-year walleye collected **below** Gavins Point Dam in 2016, 2018, and 2019, respectively. 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.

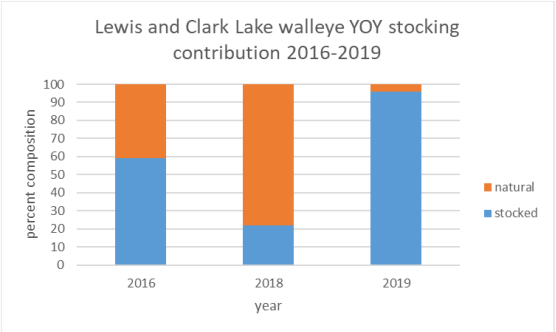
Stocking Evaluation



Various stockings have occurred since 2014 in an attempt to address low walleye numbers in the reservoir since the major flood year of 2011. The stocked fish have all been marked with oxytetracycline (OTC) so that stock contribution could be determined. 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. Contrary to the fry stocking, the fingerling stocking proved quite successful with 50% of the 2016 walleye young-of-the-year (YOY) sample being from that fingerling stocking. Due to the success of the fingerling-stocked fish, fry stocking efforts were abandoned and only fingerlings were stocked in 2018 and again in 2019.

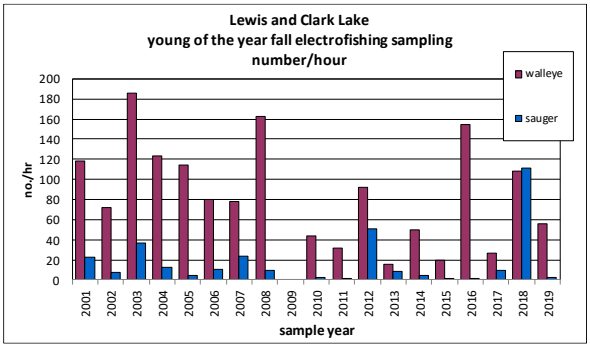


The fish stocked from 2014-2016 were released at the upper end of the reservoir only. In 2018, they were stocked at several locations ranging from the Fort Randall tailwaters to the upper end of Lewis & Clark Reservoir. YOY electrofishing indicated that both 2016 and 2018 had strong year classes of walleye in the reservoir, but appeared to lean on naturally reproduced fish more so in 2018. As mentioned, all fish (including the 1.4 million fingerlings) stocked in Lewis & Clark in 2016 were released at the upper end of the reservoir. Possibly influencing the lower contribution by stocked fish in the reservoir in 2018 is the fact that only 61% of them were stocked "in" the reservoir. Thus, the total that was stocked in-lake (i.e., the reservoir and/or associated delta) in 2018 was only about half of what was stocked in the lake in 2016. The others stocked in 2018 were released upstream at Running Water and the Ft. Randall tailwaters and, as can be seen in the second graph, many of those stocked in the Ft. Randall tailwaters stayed there and didn't move down to the lake. In 2019, the walleye fingerlings were once again stocked only at the upper end of the reservoir. The stocking assessment (i.e., stocking of marked fish) is planned to continue for the next three years. The plan is to stock 1.5 million OTC -marked fingerlings in Lewis & Clark in 2020. We will likely target that number for stocking each year through 2022 to continue to evaluate the contribution of stocked fish to year class strength and to document fish movement. This will continue to be a combined effort between the Nebraska Game and Parks and South Dakota Game, Fish and Parks.



Year	Number	Size	Source	In-lake Contribution
2014	7,182,000	Fry	NE	<1%
2015	12,800,000	Fry	NE	11%
2016	13,449,865	Fry	NE	10%
2016	1,400,000	Fingerling	SD	51%
2018	1,047,446	Fingerling	NE	22%
2019	1,800,000	Fingerling	NE	96%

Despite the fact that we are seeing good numbers of YOY walleye during our fall electrofishing, increases in the number of adult walleye in the gill net sample have been minimal. The gill net catch rate for walleye did increase somewhat in 2018 but dropped off again in 2019 to the lowest catch rate since regular sampling began in 1997. The 2018 catch was aided in large part by the age-2 fish (2016 year class) which made up 40% of the walleye sample while the 2019 catch was primarily age-1 fish (60%). As has been shown though, entrainment/escapement during high flows also contributes to reduced catch rates in the lake, especially in high flow years like 2018 and 2019. Thus, that will also be a consideration taken into account when assessing the success of the stocking efforts in Lewis & Clark.



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. Zebra mussel abundance appeared to drop off some in 2019. Anecdotally, they weren't nearly as dense on boat docks and other structures in the reservoir like they were in previous years. This doesn't mean they are dying out in the system, it's likely a function of them reaching and exceeding their carrying capacity. From this point on their population will probably oscillate from year to year, some years with higher abundance than others. The high flows could possibly have influenced their population also. Considering the Lewis and Clark Reservoir proper, South Dakota Game, Fish, and Parks (SDGFP) considers them common on the north side of the reservoir as far west as the Tabor Access Area which is about straight north across the lake from Nebraska's Miller Creek access area where one was observed in 2016 but none since. **However, they (SDGFP) discovered zebra mussels in both Lake Sharpe and Francis Case Reservoir in 2019. Anglers who fish the Missouri River <u>whatsoever</u> 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 so please be sure to clean, drain, and dry your water craft prior to leaving **<u>any</u>** body of water and never arrive at a boat launch with water in your boat, livewell, etc.

Invasive mussels will attach to almost any surface and have detrimental impacts on industry (power plants, water intakes, irrigation, etc), native fish and mussels, and recreational users (fouling boat motors, impacting beaches, etc). Invasive mussels cause an estimated $5 billion per year in economic impacts in the United States for monitoring and control efforts. Inadvertent transfer by humans is the major source of new infestation for zebra mussels; primarily by boats, boat trailers, and fishing gear. Boaters and anglers are reminded that it is important to **clean, drain and dry** their equipment and boats before moving to different bodies of water. 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 except for water from a domestic source for bait fish. 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 fishing trip to transport your fish home. Also keep in mind South Dakota law requires plugs be pulled on all watercraft leaving the lake and while in transport. Nebraska is pursuing a similar regulation.

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.

*****Boat inspections and zebra mussel sampling will continue on Lewis and Clark Lake, the Missouri River, and other waterbodies in the state in 2020. 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 invasives species such as Asian carp, Eurasian watermilfoil, rusty crayfish and red swamp crayfish. 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 Calamus Reservoir contact:

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Phil Chvala, Fisheries Biologist, Norfolk Office, Ph: 402-370-3374, email: phil.chvala@nebraska.gov

Andrew Glidden, Fisheries Biologist, Basset Field Office, Ph: 402-684-2921, email: andy.glidden@nebraska.gov

Attention motorboat owners operating in Nebraska:

Starting in 2016, boaters whose motorized watercraft are registered in any state other than Nebraska must purchase and display a $15 Aquatic Invasive Species (AIS) Stamp each year they launch their boat in Nebraska. The stamp will help fund AIS education and inspection programs.

- Boat inspections for AIS prior to launch in Nebraska are NOT mandatory at this time.
- Personal watercraft registered outside of Nebraska must have this stamp.
- Non-motorized craft registered in any state are exempt from the stamp.
- Stamps are not required for boats registered in Nebraska. A $5 AIS fee is included on the residents' three-year boat registrations.
- Residents who register their boats in other states must have this stamp before launching in Nebraska.

This stamp is available online at **OutdoorNebraska.org** or at Nebraska Game and Parks permitting offices.

Learn more about invasive species at **neinvasives.com.**

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