# Harlan Reservoir
## 2007 Fall Survey Summary

Nebraska Game and Parks Commission Brad Newcomb, District Supervisor

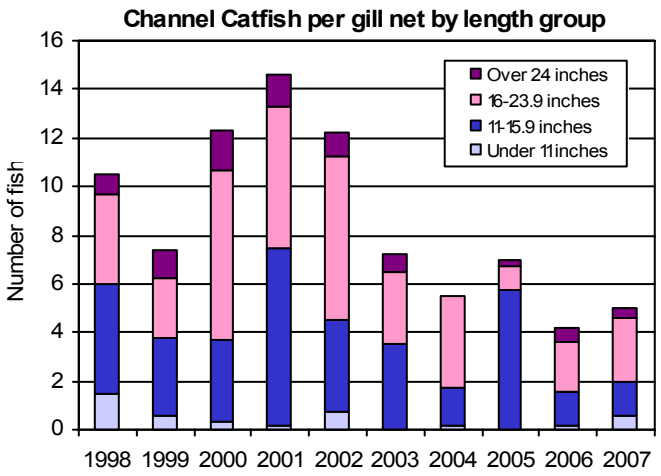
The following text and graphs are the result of netting surveys completed during October 2007 at Harlan Reservoir. For comparative purposes it also shows results from previous years. Fish populations are sampled each fall at Harlan using gill and frame nets. Gill nets are used to sample fish species found primarily in open water, such as walleye, while frame nets are used to sample shoreline oriented fish, such as crappie. The nets are set each year at approximately the same locations and dates as previous years, which reduces variability and allows for trend comparisons of species abundance and size distribution.

The following graphs show the total number of fish caught per net and the relative abundance of fish within several length categories. The text provides a brief explanation of the information shown in the graphs.

## Channel Catfish

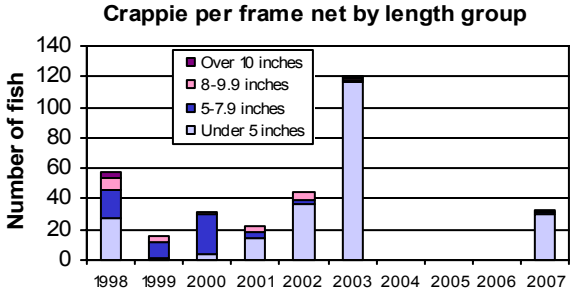
Channel catfish numbers in 2007 increased slightly from the long-term low recorded in 2006, but are still over 50% lower than the peak years of 2000-2002.

Recruitment of catfish under 11 inches improved for the first time in several years. Recruitment was enhanced by stocking and improved water levels. A total of 57,145 advanced fingerlings (5-7 inches) were stocked in 2007, which was the first catfish stocking in over 15 years. Overall, Harlan offers good catfish angling opportunities, with a variety of sizes available.

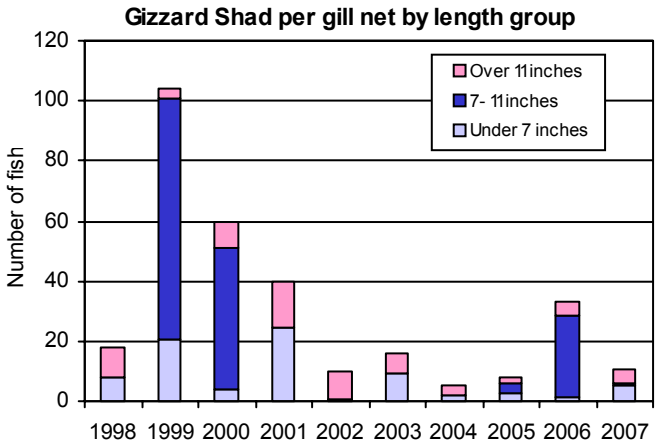



## Crappie

Higher water levels in 2007 enabled trap net sampling for crappie for first time since 2003. Most crappie sampled were under 5 inches long, and young-of-the-year. Good recruitment from 2007 and continued high water habitat should improve future crappie fishing at Harlan Reservoir.



## Gizzard Shad

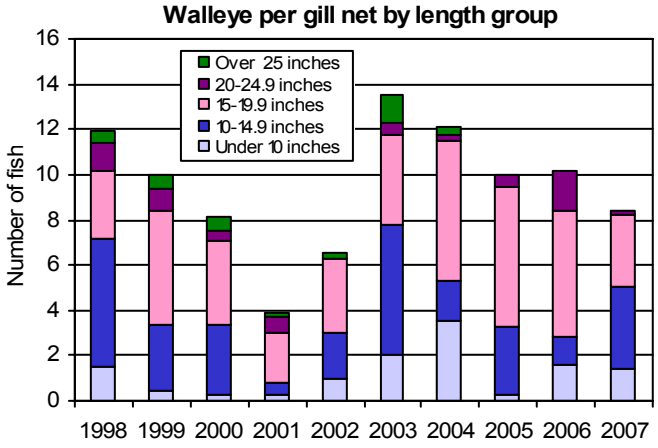



Gizzard shad numbers dropped from the large increase observed in 2006. The big increase of 7-11 inch shad observed in 2006 did not carry through to 2007.

Smaller shad are inconsistently sampled by the gear used in these surveys, and are often present in higher numbers than indicated by these surveys and this graph.

Gizzard shad are the most important prey species in Harlan Reservoir and serve as food for all the major game fish populations. Even small numbers of adult shad normally produce abundant small shad each year. Large numbers of intermediate-sized shad result in more competition for food resources with juvenile gamefish, and thus reduce survival of young-of-the-year walleye and white bass.

## Walleye




Walleye numbers were slightly lower than the past four years, but the population is still considerably higher than the historic lows of 2001 and 2002.

The current walleye population is dominated by fish from 10 to 20 inches. There was a considerable decrease in walleye from 20 to 25 inches, and very few walleye over 25 inches have been sampled the last four years.

There was a high number of walleye recruited in 2007, which ranged from 8 to 11 inches. Walleye fry were stocked in 2007, and likely contributed to this year-class strength. Walleye year-classes from 2004 to 2007 are all well-represented, but only one walleye over age three was sampled in 2007. Ages 0 to 2 make up about 86% of the current population.

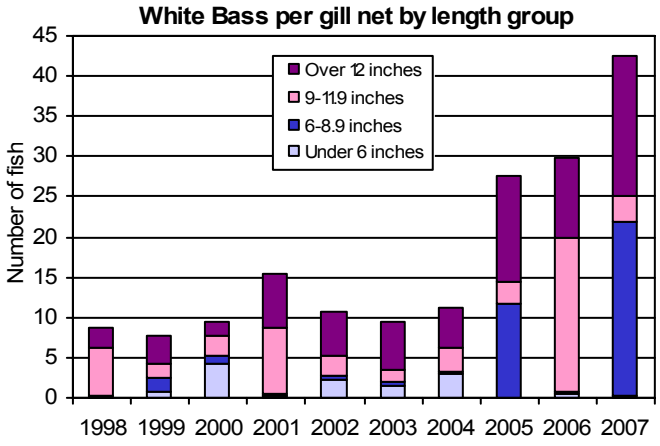
While walleye recruitment has been good in recent years, no walleye over 25 inches long have been sampled the last four years. In addition, only one walleye over 20 inches was sampled in the 2007 survey. This trend indicates high mortality of larger walleye, most likely from angler harvest.

The average length of a walleye sampled in 2007 was 13 inches, which is 3 inches less than last year. Walleye over 18 inches made up 17% of the walleye sampled, down from 37% last year.

Although overall walleye numbers are average, numbers of larger walleye are very low. There has been good walleye recruitment for several years which should provide good fishing opportunities. Harlan anglers are reminded that along with the 18-inch minimum size limit for walleye, only one walleye greater than 22 inches is allowed in the daily bag limit.

## White Bass

White bass numbers continued an impressive upward swing in 2007. Net catches from 2005 through 2007 were much higher than the previous seven years. Two size groups dominated the white bass population in 2007: 6 to 9 inches and over 12 inches.

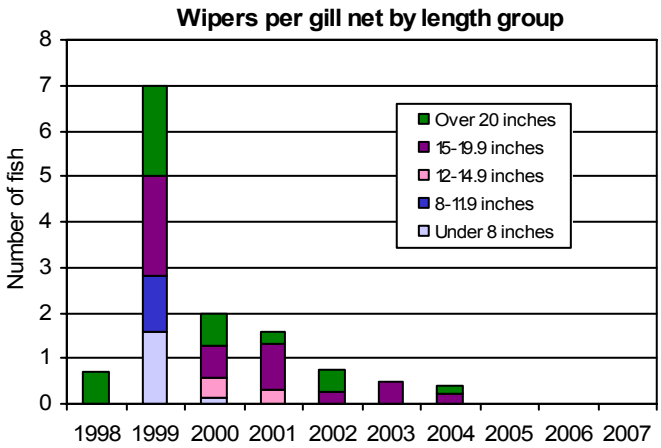



The average length of white bass from the 2007 survey was 11.4 inches, with 32% larger than 12 inches. Recruitment of white bass at Harlan has been very consistent, with fish from ages 0 to 6 represented in the 2007 survey. Recruitment was very high in 2007, as these fish made up 31% of the population and ranged from 5 to 9 inches. The 2005 year-class is still very strong (30% of the sample), with fish that range from 12 to 14 inches long.

Although white bass fishing has generally been below average the last few years, the population of white bass is very high with an excellent size distribution. Therefore, the potential exists for excellent white bass fishing the next few years.

## Wipers

Continuing the recent trend, wiper abundance is extremely low at Harlan. No wipers were sampled from 2005 to 2007. The reduced abundance is a result of no stocking from 2000 to 2004. Wipers stocked in 2005 have not been sampled in the last three netting surveys. As in the past few years, Harlan's wiper population is expected to be the lowest of all major Nebraska reservoirs with wiper populations. With the continued low density of wipers, angler catch should also be very low in next few years.




Results from a 2002-2003 food habit study involving major predator fish species indicated very little competition between wipers and walleye. Based on those results, wiper stocking has been reinstated with 16,000 wiper fingerlings stocked in June 2005 (two per acre). Wiper stockings are currently planned every three years, which will hopefully improve the population to provide a sustainable sport fishery.

# Additional Information about Harlan Reservoir

## Water Levels

Harlan Reservoir water levels increased dramatically in 2007, rising to elevation 1,940 in May, and continued high throughout December. With the increased water levels, aquatic habitat has greatly increased with many acres of flooded terrestrial vegetation such as willows and cottonwoods.

Higher water levels and increased aquatic habitat resulted in good recruitment of many fish species. Recruitment of walleye and white bass remained high, and for the first time in many years there was good recruitment of channel catfish and crappie. Channel catfish numbers were enhanced with a supplemental stocking of advanced fingerlings in 2007.

For the first time in many years, the Methodist Cove boat ramp became operable in 2007. Boat access at Gremlin Cove and Patterson Harbor also improved with higher water. The Hunter Cove and Cedar Point low water boat ramps were under water for most of the 2007 fishing season.

## Fish Stocking

Due to declining population trends, Harlan Reservoir received a stocking of **channel catfish** in 2007. Over 54,000 advanced fingerlings, 5 to 7 inches, were stocked in June. Only about 35,000 catfish were requested for stocking, but with increasing water levels, Harlan received most of Nebraska's excess hatchery production in 2007.

Based on results of several years of research into wiper interactions in Harlan Reservoir, **wiper** stockings started again in 2005 with a stocking of 2 fingerlings per acre. The current approach is to stock wipers every three years which corresponds to years walleye are not stocked. Wiper fingerlings will be stocked again in 2008.

About 11 million **walleye** fry were stocked in 2007, with Harlan receiving the all state's excess production because of increasing water levels. This stocking was a continuation of enhanced walleye stocking strategies at Harlan Reservoir. New strategies initiated in 2003 included stocking walleye fry (0.5 inches) at 1,000/acre, or advanced fingerlings (3-4 inches) at 20 per acre. Advanced fingerlings were stocked in 2003 and 2006, fry were stocked in 2004 and 2007, with no walleye stocked in 2005 and 2008. Both fry and advanced fingerling strategies appear to have been more successful than previous fingerling stockings, with the 2004 and 2007 year-classes appearing the best. The 2005 walleye year-class, with no stocking, was also better than average. Walleye recruitment results from 2003 through 2008 will help determine future stocking strategies.

## Walleye Egg Collections

Walleye eggs were collected at Harlan from 2003 trough 2006, with most of these eggs used for walleye fry stockings in Nebraska. Due to timing and personnel limitations, no walleye eggs were collected from Harlan in 2007 and there are no plans for 2008.

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# Additional Information Continued...

## Aquatic Habitat Project at Harlan Reservoir

Harlan Reservoir is included on the initial list of sites as part of Nebraska's Aquatic Habitat Program. This program is designed to rehabilitate aquatic habitat in aging reservoirs to provide enhanced fishing opportunities. The Aquatic Habitat Program utilizes funding generated from Nebraska's Aquatic Habitat Stamp and various matching sources.

To initiate the aquatic habitat project at Harlan Reservoir, a project proposal will be completed in early 2008. The project proposal will identify locations for habitat improvements, and detail methods and techniques to be employed at each site. The overall project goal will be to restore and protect selected shoreline, point, and cove habitats at Harlan Reservoir in order to improve or sustain walleye and other fish populations.

The initial planning process will be completed with input the US Corps of Engineers staff at Republican City. The completed project proposal will be reviewed at various levels, followed by the hiring of a design and engineering consultant. The design process, with site visits and reviews, will likely be completed by early 2009. After State and Federal approval, the bid process will begin, with construction following.

Uncertain water levels at Harlan Reservoir will present a special challenge for the design process. The project proposal will likely include sites for both low and high water conditions, and individual sites will be completed contingent on future water levels in the lake.

A PowerPoint program about the Harlan Aquatic Habitat Project was presented to members of the Harlan Lake Association in August. Copies of the presentation are available from the NGPC Kearney office.

## Public Information

Paper copies of this summary are supplied to the US Army Corps of Engineers Office in Republican City. Also, the Game and Parks fisheries staff presents an update of Harlan fisheries management at the annual Harlan Walleye Anglers Group meeting in Holdrege.

*For additional information about fisheries management at Harlan Reservoir, please contact the NGPC Kearney office at 308-865-5310 or by email at the addresses listed below.*

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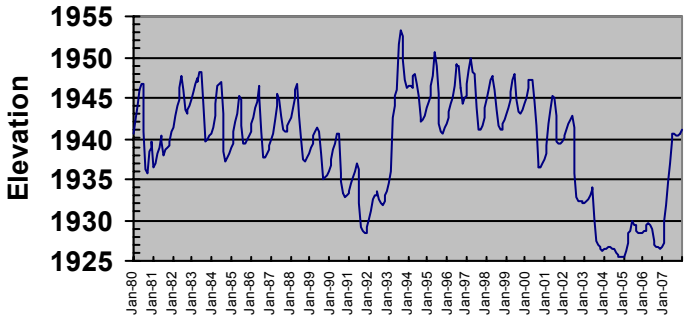
*Fisheries Biologist:* *Brad Eifert, brad.eifert@ngpc.ne.gov*

# Harlan Reservoir in 2007

**Water elevations at Harlan Reservoir Since 1980**

**Conservation Pool is 1946msl**




**Methodist Cove Boat Access in August 2007**


**Aerial Views of Harlan Reservoir Comparing Low Water Conditions in 2006 with High Water Conditions in2007**


Aerial Photo - Harlan County Lake
August 2006 - Elevation 1927.3


Aerial Photo - Harlan County Lake
August 2007 - Elevation 1940.5