

Control and Removal of Asian Carp in the Ohio River 2015 Report

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Introduction:

Eradication of invasive species after establishment is difficult and often limited by available resources. Prevention and rapid response are the best tools for limiting establishment of costly invasive species, and physical Asian carp removal in the Ohio River basin may be an effective tool to slow their upstream expansion. Recent studies on Asian carp harvest programs in the Illinois River show that the collapse of silver and bighead carp populations are possible if all fish sizes are targeted (Tsehaye et al. 2013). Diverse and consistent removal efforts in the portion of the Ohio River where Asian carp are established may disrupt distribution of Asian carp, decrease pressure on defined barriers, and reduce numbers of Asian carp in sensitive areas to protect species of conservation need or important sportfisheries. Removal efforts will also complement monitoring efforts to further understand the status, distribution, and biology of Asian carp in the Ohio River. This data will provide an assessment tool which will guide monitoring, barrier defense, and removal efforts in future years.

Objectives:

- Remove Asian carp from Ohio River pools above McAlpine Dam.
- Compile information on Asian carp population dynamics as a tool for assessing success of removal efforts.
- Encourage commercial removal of Asian carp in the Upper Ohio River and provide information to current and potential Asian carp processors.
- Provide information and data to monitoring and response efforts.

Methods:

Electrofishing and gill netting were conducted for 8 weeks from August- October 2015. Removal took place a minimum of 4 days per week. Electrofishing was not standardized, but effort (hours) was recorded as a measure of efficiency. Large mesh (3.0” – 5.0”) gill nets were used and each set consisted of a minimum of 30 minutes of soak time while actively driving fish towards the nets by creating motor noise, boat wake, and banging on the boat. Nets were occasionally set overnight in areas where they did not create hazards to navigation.

Sampling sites focused on tributaries and embayments in each pool below Greenup Locks and Dam where densities of Asian carp are highest and fish are easiest to capture. Because densities were not high enough to warrant targeted removal in the Greenup pool, sampling efforts were moved down river to higher density areas in the Cannelton pool.

All Asian carp and bycatch were identified to species. Asian carp were inspected for tags (ultrasonic and jaw tags) before being tagged or euthanized, and bycatch was immediately returned to the water. All Asian carp species (Bighead Carp, Silver Carp, and Grass Carp) from each sampling location were measured in total length (in) and weighed (lbs) to provide estimates of the minimum total weight harvested. Supplemental data included a record of sex and a collection of aging structures (spines) for each silver or bighead carp captured (Williamson and Garvey 2005, Seibert and Phelps 2013).

Kentucky has worked with the commercial fishing industry in Western Kentucky to promote the harvest of Asian carp and identify ways to support the industry. The intent is to facilitate the commercial removal of Asian carp and provide a platform for data collection within the industry. KDFWR hosts and attends meetings throughout the year with various entities including commercial fishers, existing processors, and potential investors with the intent of growing the potential Asian carp removal from Kentucky waters. In 2015, TWRA released a plan for addressing the growing populations of Asian carp in Kentucky Lake and Lake Barkley including potential funding from private sources to support harvest of Asian carp.

Results:

Electrofishing Sampling and Targeted Catch – A total of 47.19 hours were spent electrofishing the Ohio River and its tributaries between Cannelton and Greenup locks and dams. The highest amount of effort was placed in the McAlpine pool, which yielded a minimum catch of 93 invasive carps totaling more than 1,000 lbs. However, the highest yield came from the Cannelton pool where 247 invasive carps were captured during 13.26 hours of electrofishing time. This catch totaled more than 2,600 lbs. and consisted of silver carp and grass carp only (Table 1).

Gill Net Sampling and Targeted Catch – Gill netting was not effective in any of the pools during the 2015 removal season and therefore was tapered back to conserve time and manpower during the project. A total of eight Asian carps were captured using 2,566 yards of net. Six of these eight fish were silver carp, captured in the McAlpine and Cannelton pools. The remaining fish were bighead carp that were captured farther up the river in the Markland and Meldahl pools. The minimum total weight of carp captured totaled 186 lbs. from these efforts (Table 2).

Commercial Removal and Outreach – Outreach and communication efforts with the commercial fishing industry in Kentucky have resulted in the establishment of three fish processors currently buying Asian carp harvested from Kentucky waters, plans for the creation of new processors on the Ohio River near Owensboro, KY and Metropolis, IL, and a clear understanding of what partners at all levels in the industry need to be successful. In 2015, over 1 million pounds of Asian carp were harvested and sold to various domestic and export markets from Kentucky waters. The result is a clear understanding of how the commercial fishers and fish processors operate, the limiting factors in growing the industry, and ideas for future programs to assist in that effort.

Discussion:

This removal project is an expansion of the removal efforts from the 2013 and 2014 projects. It is the first attempt to comprehensively track and total the numbers of carp removed from Ohio River pools in the upper ranges of Asian carp expansion. Because this project was conducted in tandem with several other projects (e.g. telemetry), with several different sampling groups and agencies, it became difficult to keep track of which carp were euthanized and which were tagged. Thus, the results here report a minimum number and total weight of carp captured for the 2015 year; actual amounts are higher than reported in the tables. However, utilizing both boat electrofishing and gill netting, more than 4,054lbs of Asian carp were captured and 37 of those fish were tagged yielding a minimum total number of carp euthanized of 316 individuals (~90% of the reported catch).

Electrofishing was a consistently more effective method of capturing Silver carp in 2015. Silver carp are the most susceptible to boat electrofishing of the three Asian carps. However, they can be difficult or impossible to catch in locations other than shallow tributaries or along the banks of island back-channels, where they cannot escape the electric field. Gill netting silver carp was problematic due to their excellent net avoidance; they were witnessed jumping over several nets in a row on multiple occasions to avoid capture. Recent conversations with commercial fishermen in Western Kentucky revealed specifications for building gill nets that may lead to higher catches. According to this knowledge, the type of

monofilament used in 2015 was too large in diameter resulting in nets that were stiff and easily seen by fish. We will use a different type of gill net in 2016 to test this theory. One bighead carp was captured via boat electro-shocking in the McAlpine pool, but that proved to be an uncommon occurrence since all other bigheads captured for the year (including all other Ohio River projects) were taken in gill nets with mesh larger than four inches. Grass carp were uncommon and sporadic in location, but did seem to be in higher abundances in Cannelton and McAlpine. Grass carp, like silver carp, were more effectively caught when utilizing boat electrofishing.

A subsample of euthanized *Hypophthalmichthys* species were used to collect pectoral spines for age analysis (Williamson and Garvey 2005, Seibert and Phelps 2013). Synopses of these results are included in the Monitoring and Response of Asian Carp in the Ohio River interim report.

Currently, three commercial fish markets produce boneless fillets, offal for fertilizer, surimi, and several additional specialties such as patties or fish nuggets. In 2016 we plan to work directly with the commercial industry to experiment with fishing techniques that will increase fishing efficiencies and yield. While this market is currently small, support from this work should help establish strong foundations that lead to better and more profitable control of Asian carp.

Recommendations:

This project only scratches the surface of what can be accomplished by removing Asian carp in the Ohio River Basin. It is recommended that agency removal continue now that a baseline sampling design has been established and is informing the catchability of these fish. Continuation of removal in future years will help characterize and inform management decisions necessary for the mitigation of Asian carp in the Ohio River drainage. The current design of this project should be retained, but other sampling techniques should be explored and utilized in the future to expand the scope of sampling for more robust removal. Continued support and outreach to the commercial industry may result in an expansion the Asian carp market and an additional tool in limiting the impacts and expansion of Asian carp in the basin.

Project Highlights:

- Physical Asian carp removal in the Ohio River basin is currently the only tool available to slow the upstream expansion of these species.
- A total of 47.19 hours were spent electrofishing and 2,566 yards of nets were used in the Ohio River and its tributaries between Cannelton and Greenup locks and dams to capture more than 4,054lbs of Asian carp for removal (~90% of reported catch) or telemetry (~10% of reported catch).
- Silver carp and grass carp are the most susceptible species to boat electrofishing of the three targeted Asian carps while bighead carp are more effectively caught using gill nets.
- It is recommended that removal for 2016 continue now that a baseline sampling design has been established and is informing the catchability of these fish.

Tables:

Table 1. Electrofishing effort (hours) and resulting catch of three species of Asian carp (number and weight) for five pools of the Ohio River during Asian carp removal efforts in 2015.

Pool	Electro Hours (hr)	Bighead Carp (N)	Silver Carp (N)	Grass Carp (N)	Total (N)	Bighead Carp (Lbs)	Silver Carp (Lbs)	Grass Carp (Lbs)	Total (Lbs)
Greenup	0.00	0	0	0	0	0.00	0.00	0.00	0.00
Meldahl	4.40	0	0	0	0	0.00	0.00	0.00	0.00
Markland	9.10	0	5	0	5	0.00	174.30	0.00	174.30
McAlpine	20.43	1	91	1	93	46.00	1031.18	0.00	1077.18
Cannelton	13.26	0	244	3	247	0.00	2555.96	60.50	2616.46
Total	47.19	1	340	4	345	46.00	3761.44	60.50	3867.94

Table 2. Gill netting effort (yards) and resulting catch of three species of Asian carp (number and weight) for five pools of the Ohio River during Asian carp removal efforts in 2015.

Pool	Total Net Length (yds)	Bighead Carp (N)	Silver Carp (N)	Grass Carp (N)	Total (N)	Bighead Carp (Lbs)	Silver Carp (Lbs)	Grass Carp (Lbs)	Total (Lbs)
Greenup	0	0	0	0	0	0.00	0.00	0.00	0.00
Meldahl	400	1	0	0	1	0.00	0.00	0.00	0.00
Markland	200	1	0	0	1	70.00	0.00	0.00	70.00
McAlpine	1766	0	5	0	5	0.00	105.90	0.00	105.90
Cannelton	200	0	1	0	1	0.00	10.20	0.00	10.20
Total	2566	2	6	0	8	70.00	116.10	0.00	186.10

Literature Cited:

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- Williamson, C. J., and J. E. Garvey. 2005. Growth, Fecundity, and Diets of Newly Established Silver Carp in the Middle Mississippi River. *Transactions of the American Fisheries Society* 134(6):1423–1430.