

Chicago Sanitary and Ship Canal – Electric Barriers



US Army Corps
of Engineers®
Chicago District

Asian Carp Monitoring Fact Sheet

Acoustic Telemetry

Overview:

Telemetry is an automated communications process used to collect data remotely by a monitoring system. The Chicago District Telemetry Monitoring Project implants fish with individually-coded, ultrasonic transmitters in the Upper Illinois Waterway (IWW) and Chicago Area Waterways System (CAWS) to track patterns of fish activity. Transmitted data is collected remotely by a system of 27 stationary receivers and further supplemented by a mobile receiver unit which can be utilized at areas of interest. Transmitters are implanted into free-swimming Asian carp (Bighead Carp and Silver Carp) and surrogate species (primarily Common Carp). The purpose is to monitor fish movements in the immediate vicinity of the Electric Dispersal Barrier System (barriers) to determine if fish are able to challenge and/or penetrate the barriers; to see if Asian carp or surrogate species are able to navigate through lock structures in the Upper IWW; and to determine the leading edge of Asian carp below the barriers. Additionally, movement information will lead to a better idea of how fish behave seasonally in the IWW and CAWS, and can help inform the implementation of other monitoring tools (environmental DNA, netting, and electrofishing).

Scope:

Stationary receivers (mounted to lock guide walls, mooring cells, navigation buoys) detect a tagged fish's movement as it swims within range (~800m). A total of 27 receivers comprise the acoustic network; each is downloaded every other month from March through November. Receivers in the vicinity of the barriers are armored for protection from navigation traffic. The Chicago District receiver network extends from Lemont, Illinois, on the Chicago Sanitary and Ship Canal to Channahon, Illinois, at the Dresden Island Lock in the Illinois River. Additionally, mobile tracking is used to actively locate tagged fish for precise locations as needed. Mobile tracking helps determine precise locations and movements within the pools, and is used to help direct removal efforts. Chicago District also works closely with additional telemetry programs maintained by Southern Illinois University, US Geologic Survey, and the US Fish and Wildlife Service which extends receiver coverage throughout the Illinois River into the Mississippi River.

Summary:

A total of 674 fishes have been surgically implanted with transmitters from 2010 through 3 October 2019, resulting in over 29.1 million detections within the IWW and CAWS. Analysis of data collected to date indicate that the barriers are effectively preventing upstream passage of live tagged fishes (total length range: 54 - 1120mm). Tagged-fish movement between navigation pools occurs in both directions through all locks within the study area with the lowest rate of upstream movement occurring at the Brandon Road Lock. While three tagged Asian carp have approached the Brandon Road Lock and Dam to date, the majority of Asian carp detections are limited to below river mile 281.5 near the Rock Run Rookery on the Des Plaines River. Asian carp are consistently using the Kankakee River confluence and deep, backwater pools stemming from the main channel. There has been no difference detected between tracked movements of Bighead and Silver carp species within Upper IWW. Asian carp activity appears to be higher in late spring and early summer as well as during the evening, dawn and dusk hours of the day.

What's next:

Additional tagging will occur throughout the study area to maintain the current level of active transmitters within the system. Emphasis will be placed on increasing the number of transmitters in surrogate species and Asian carp below the Brandon Road Lock within the Dresden Island Pool. Additional receivers will be deployed surrounding the approach channel to the lock, within the lock chamber and within backwater habitats just downstream to identify possible mechanisms that could be deterring upstream passage. The study will also include the addition of transmitters with depth and temperature sensors. This will allow researchers to better understand at what depth fish interact with the barriers and barge traffic as well as assist in determining fatalities of tagged specimens.

Authority:

The Water Resources Development Act of 2007, Section 3061, Chicago Sanitary and Ship Canal Dispersal Barriers Project, Illinois, authorized the Barrier project.

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Surgical implantation of an acoustic transmitter into the body cavity of a Bighead Carp.



Chicago District biologists tagging Asian carp in the field near the area of capture.