2017 November-December Summary

Bottom Line: Monitoring occurred in the CAWS and upper Illinois Waterway upstream and downstream of the Electric Dispersal Barrier in September. **NO LIVE BIGHEAD CARP OR SILVER CARP were found in any new locations immediately upstream or downstream of the Electric Dispersal Barrier.**

Fixed, Random and Targeted Site Sampling Downstream of the Electric Dispersal Barrier

Electrofishing:

- Crews from IDNR completed 24 electrofishing runs at fixed and random sites (6 hours total) in the Dresden and Marseilles Pools in November.
- Crews collected 715 fish of 27 species and 1 hybrid group.
- One Bighead Carp and 21 Silver Carp (all adults) were collected in the Marseilles Pool.
- Fifteen adult Silver Carp were collected in Rock Run Rookery.

Hoop and Mini Fyke Netting:

- Crews from IDNR set and pulled 16 hoop nets and 16 mini fykes from fixed sites in Lockport, Brandon Road, Dresden Island and Marseilles Pools in November.
- Crews collected 11 fish of 5 species during hoop net sampling and 446 fish of 14 species during mini fyke sampling.
- **No Bighead Carp or Silver Carp were reported captured or observed with either gear in any of the pools.**

Commercial Netting:

- Contracted commercial fishers along with assisting IDNR biologists set 28.1 miles of gill net at fixed and targeted sites in the Lockport, Brandon Road and Dresden Island Pools (including Rock Run Rookery) in November.
- Crews collected 831 fish of 13 species.
- Three Bighead Carp and 6 Silver Carp were collected in Rock Run Rookery.
- Two Bighead Carp and 2 Silver Carp were collected in the Dresden Island Pool, downstream of I-55.
- **No Bighead Carp or Silver Carp were captured or observed in the Lockport or Brandon Road Pools.**

Sampling results by pool below the electric dispersal barrier in 2017, along with 2015 and 2016 for comparison:

Lockport			
	2015	2016	2017
Yards of Net Fished	84,750	100,775	92,900
Miles of Net Fished	48.2	57.3	52.8
Hoop Net Nights	58.7	61.0	53.3
Mini Fyke Net Nights	28.5	29.8	28.8
Electrofishing Runs	132	127	118
Electrofishing Time (hrs)	33.0	31.8	29.5
Total Asian Carp (AC)	0	0	0
Tons of AC Harvested	0	0	0

Brandon Rd			
	2015	2016	2017
Yards of Net Fished	87,000	92,025	104,675
Miles of Net Fished	49.4	52.3	59.5
Hoop Net Nights	58.2	60.9	57.5
Mini Fyke Net Nights	27.6	30.0	29.9
Electrofishing Runs	116	129	117
Electrofishing Time (hrs)	29.0	32.3	29.3
Total Asian Carp (AC)	0	0	0
Tons of AC Harvested	0	0	0

Dresden Island			
	2015	2016	2017
Yards of Net Fished	96,750	89,025	131,700
Miles of Net Fished	55.0	50.6	74.8
Hoop Net Nights	110.8	61.4	350.5
Mini Fyke Net Nights	30.6	31.7	35.3
Electrofishing Runs	155	237	184
Electrofishing Time (hrs)	38.8	59.3	46.0
Asian Carp (AC) upstream I-55	27	13	28
AC downstream I-55	159	298	567
Total AC	186	311	595
Tons of AC Harvested	1.4	2.1	4.9
AC/1000 yds of gill net	1.7	3.1	4.3

Rock Run Rookery			
	2015	2016	2017
Yards of Net Fished	39,550	52,125	40,800
Miles of Net Fished	22.5	29.6	23.2
Bighead Carp	192	144	179
Silver Carp	44	40	70
Total Asian Carp (AC)	236	184	249
Tons of AC Harvested	3.8	2.9	3.8
AC/1000 yds of gill net	6.0	3.5	5.6

Barrier Defense Asian Carp Removal Project

Barrier Defense specifically takes place in the Marseilles and Starved Rock Pools. Below is a summary of all IDNR Barrier Defense activities in 2017 along with 2015 and 2016 for comparison:

	2015	2016	2017
Number of Days Fished	70	101	89
Number of Net Crew Days	321	464	470
Yards of Net Fished	390,270	533,865	453,660
Miles of Nets Fished	221.7	303.3	257.8
Number of Pound Net nights	24	67	74
Number of Hoop Net nights	163.8	768.7	987.3
Number of Bighead Carp	8,206	7,985	2,609
Number of Silver Carp	137,485	146,342	163,184
Number of Grass Carp	857	682	1166
Number of Asian Carp (AC)	146,548	155,009	166,959
Tons of AC Harvested	486.3	541.3	555.8
AC/1000 yds of gill net	361.2	279.4	336.3

Marseilles			
	2015	2016	2017
Yards of Net Fished	251,440	374,235	251,210
Miles of Nets Fished	142.9	212.6	142.7
Pound Net nights	24	67	74
Hoop Net nights	83.4	144.2	103.3
Mini Fyke Net Nights	31.4	29.4	34.2
Electrofishing Runs	169	156	132
Electrofishing Time (hrs)	42.3	39.0	33.0
Bighead Carp	5,387	5,957	1,495
Silver Carp	69,105	63,525	42,386
Grass Carp	228	110	70
Total Asian Carp	74,720	69,592	43,951
Tons of AC Harvested	276.6	302.6	192.3
AC/1000 yds of gill net	281.0	179.4	168.6

Starved Rock			
	2015	2016	2017
Yards of Net Fished	138,830	159,630	202,450
Miles of Nets Fished	78.9	90.7	115.0
Hoop Net nights	141.2	683.1	938.6
Bighead Carp	2,908	2,048	1,123
Silver Carp	68,681	83,790	121,264
Grass Carp	641	606	1115
Total Asian Carp	72,230	86,444	123,502
Tons of AC Harvested	211.3	242.7	365.6
AC/1000 yds of gill net	505.1	514.2	543.7

Understanding Surrogate Fish Movement with Barriers

- results for November 2017

Fish Tagged:
Lockport Pool
- Common Carp – 23

Brandon Road Pool
- Common Carp – 2
- Smallmouth Buffalo – 2

Dresden Island Pool
- Common Carp – 5
- Smallmouth Buffalo – 7

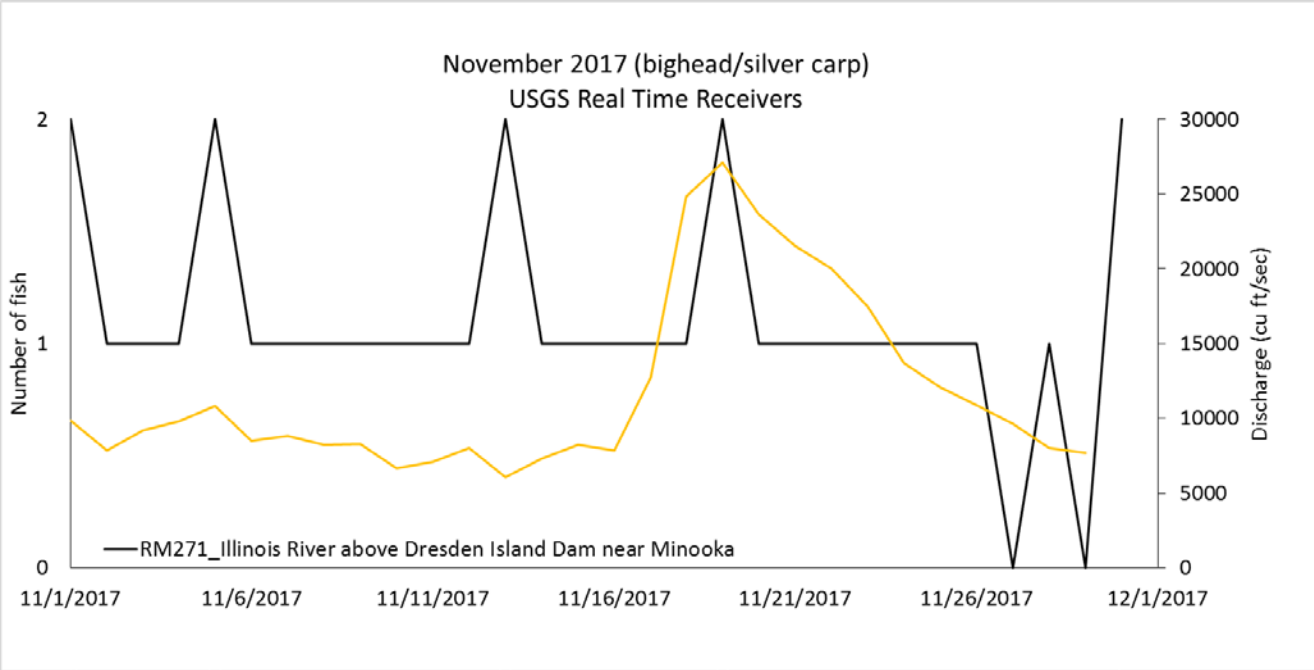
Total – 39 fish tagged

Recaptures:
Dresden Island Pool/Rock Run Rookery
- Bigmouth Buffalo – 2
- Black Buffalo – 2
- Smallmouth Buffalo – 5
    - **No recaptured fish demonstrated movement between pools**

Telemetry Monitoring

USACE biologists completed downloads at 28 receivers within the Lockport, Brandon Road, and Dresden Island Pools on 28-30 November. The receiver network throughout these pools was stripped down to essential over-winter receiver locations that are protected from ice and navigation hazards. Batteries for each receiver were also tested and changed as necessary to ensure overwinter operation. Download data was briefly scanned for detections indicating inter-pool movement or dispersal barrier passage. No Bighead or Silver Carp were detected upstream of the Brandon Road Lock and Dam. No fish passage through the electric dispersal barrier system was observed. The data will continue to be processed for fish movement and habitat use patterns for inclusion in the annual summary report. Additionally, data is being shared across agencies (SIUC, USFWS, and USGS) for database management and further analysis of tagged fish response to the October Dresden Unified Fishing effort. Finally, one Silver Carp was tagged with a temperature/pressure sensored transmitter within the Dresden Island Pool during targeted electrofishing surveys. This fish was released at the site of capture just downstream of Harborside Marina.

USGS Real Time Telemetry



Three Asian carp (2 bighead carp and 1 bighead-silver carp hybrid) were detected at one real-time receivers during the month of November 2017. All fish were detected above Dresden Island Lock and Dam near Minooka, IL (River Mile 271). There were additional grass carp and common carp detected at other receivers (above and below Brandon Road Lock and Dam). This information can be viewed in the attached dataset. More detailed detection data can be found at https://my-beta.usgs.gov/fishtracks/index or by contacting Marybeth Brey at USGS UMESC.
Contact: Marybeth Brey, mbrey@usgs.gov ,(608)781-6243.

Habitat usage and movement of juvenile Asian carp (Telemetry)

Telemetry of juvenile Asian carp to study habitat usage and movement continued in the Peoria reach continued through November 2017. Two additional radio monitoring locations were set up making a total of nine in the Peoria reach. Tagged fish now total 72 individuals, although tag life from the initially tagged fish (May/June) is coming to an end. Additional efforts this year will focus on removal of hydrophones before ice conditions, maintaining the radio monitoring stations, and actively tracking tagged fish.

Barrier Maintenance & Fish Suppression

USACE continued operation of the Electric Dispersal Barriers throughout November with minimal loss of power to the water at one or more barriers. During this time, there were three events which lead to a minor loss of power to water at Barrier IIB as power was transferred between utility and generator. On 30 October, operation of Barrier IIB switched from utility power to generator power to accommodate work performed by the utility provider. This resulted in one minor outage (<30 sec) on 30 October transferring to generator power and another on 6 November when the work was completed. There were two severe weather events on 17 and 18 November where utility power was lost that led to four additional Barrier IIB power transfer events. The generators activated immediately and carried power until the utility power was restored. Barrier IIA remained operational during the Barrier IIB transfers. The wide and narrow arrays of Barrier IIA, wide and narrow arrays of Barrier IIB and the demonstration barrier are currently operational. Current operating parameters for all barriers are provided below:
Barrier IIA wide: 800 V (.75 V/in); 34 Hz, 2.3 ms
Barrier IIA narrow: 2000 V (2 V/in); 34 Hz, 2.3 ms
Barrier IIB wide: 800 V (.75 V/in); 34 Hz, 2.3 ms
Barrier IIB narrow: 2200 V (2.3 V/in); 34 Hz, 2.3 ms
Demo Barrier: 400 V (.5 V/in); 5 Hz; 4 ms

Barrier Defense Using Novel Gear

Mass Removal:
During November 14–16, 2017, staff from the USFWS Columbia collaborated with the Illinois Department of Natural Resources' barrier defense project to remove Asian carp from the Starved Rock Pool of the Illinois River using an electrified paupier. A total of 3,466 Silver Carp (approximately 19,369 lbs) were removed in 5.7 hours of electrotrawling (Table 1). The paupier captured Silver Carp at a rate of 608/electrotrawling hour. Total time spent on the water (17 hours) and crew size (4 people) were tracked to assess the cost-effectiveness. Although six people were present, two were nonessential to the paupier technique because they were utilized only for data collection. Biomass of Silver Carp removed was 285 lbs/labor hour. Other time components of paupier operations were tracked (gear set-up/take-down, search for fish, electrotrawling time, removing fish from nets, and gear repair) to assess efficiency after field season collection.

Table 1. Barrier defense efforts using an electrified paupier in the Starved Rock Pool, upper Illinois River, November 14–16, 2017.

Number of Days on Water	3
Hours on Water	17.0
Crew Size (opperating paupier and tender boat)	4
Labor Hours (Crew Size*Hours on Water)	68
Electrotrawling Hours	5.7
Silver Carp Count	3,466
Bighead Carp Count	1
Grass Carp Count	0
Silver Carp Biomass (lbs)	19,369
CPUE (Silver Carp Biomass/Labor Hour)	285
CPUE (Silver Carp Biomass/Electrotrawling Hour)	3,398
CPUE (Silver Carp Count/Electrotrawling Hour)	608

Diel sampling:

From evening and through the night, the USFWS Columbia sampled backwaters (Hanson Material Services East and West Pits in the Marseilles Pool) of the Illinois River with an electrified paupier in May (spring), August (summer), and November (fall) 2017. Sampling was standardized at 5 minutes and transects were random, generated using ArcGIS. Although results are preliminary, average catch rates tended to be higher in summer (August = 7.5 Silver Carp/transect) compared to spring (May = 2 Silver Carp/transect) and fall (November = 2.9 Silver Carp/transect; Figure 1). Unlike spring, catch rates in summer and fall did not exhibit a steady increase into the night (Figure 1). Additionally, the Fox River (tributary in the Starved Rock Pool) was sampled one night in November (fall) 2017. Average catch rates were much higher than the backwaters (46.2 Silver Carp/transect), which peaked after sunset during the 5 PM-hour. Further data exploration and statistical testing will determine if nighttime mass removal with the paupier in the Illinois River is warranted to potentially increase catch rates.

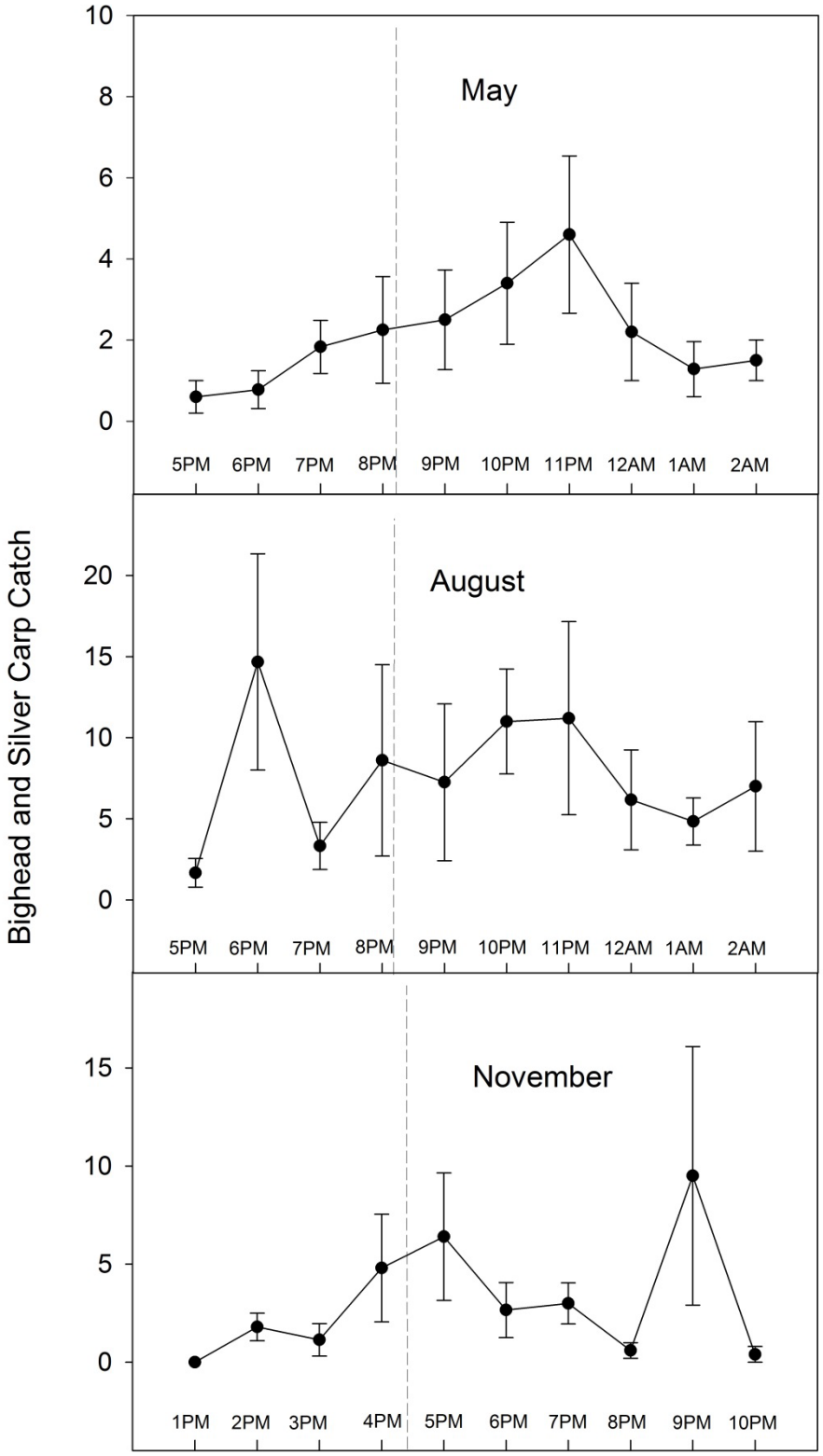


Figure 1. Hourly average Bighead and Silver carp catch and standard error using an electrified paupier from 5PM to 2AM in Hanson Material Services East and West Pits in May, August, and November 2017. The vertical dashed lines represent sunset (May = 8:15PM; August = 8:11 PM November = 4:25 PM). Note different scale on y-axis.

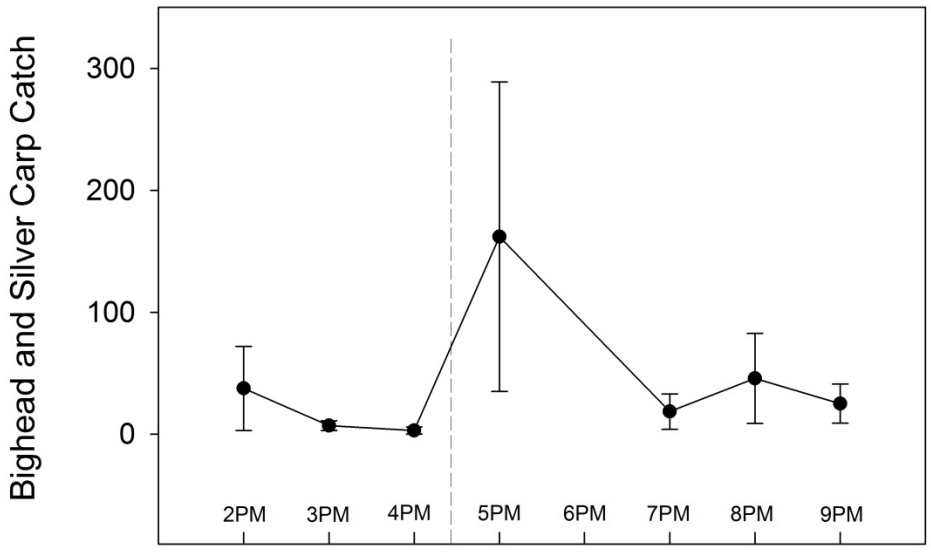


Figure 2. Hourly average Bighead and Silver carp catch and standard error using an electrified paupier from 2PM to 9PM in the Fox River, November 2017. The vertical dashed line represents sunset (4:25 PM).

Distribution and monitoring of juvenile Asian carp

No field work was conducted to monitor for juvenile Asian carp in the upper pools during the month of November. Effort was spent on getting all data entered and identifying preserved specimens.

Hydroacoustic Fish Density Survey at the Romeoville, IL Electric Fish Dispersal Barrier System

Two mobile hydroacoustic fish surveys were performed at the Electric Dispersal Barrier during November 2017. Surveys were conducted on November 14th and November 30th. Additionally, hydroacoustic surveys of the Lockport and Brandon road pools were conducted the second week of November. Preliminary results follow:

Preliminary Results 11-14-2017 Barrier Survey: The density of small fish (< 6”) observed during the survey was low compared to previous surveys conducted this year. Densities of large fish (> 6”) between the active barriers were low. Two fish targets > 6” in estimated length were observed between the active barriers. These targets were estimated to be 278 mm and 170 mm in length.

Preliminary Results 11-30-2017 Barrier survey: The density of small fish (< 6”) observed downstream of the barriers and between the active barriers during the survey was low. There were no large fish (> 6”) between the active barriers.

Alternate Pathway Surveillance in Illinois - Law Enforcement

The Invasive Species Unit (ISU) completed an investigation of a New York company for selling and shipping live Egeria densa, an injurious plant species, to Illinois customers without injurious species permits. The company had been selling the plant to customers who didn't possess a permit, and was warning them not to release the plant outdoors. Recently, the company enacted a policy that required customers to produce an IDNR injurious species permit prior to the item being sold or shipped. The company was sent all relevant IDNR regulations and a memo warning that any future sales without the proper permits will result in citations.

Assessing Spatiotemporal Changes in Asian Carp Abundance and Density to Target Management Actions and Control Strategies

Mobile hydroacoustic surveys were conducted in the Illinois River from Dresden Island to Alton pools. These surveys were conducted at standardized sites to assess long-term (2012 – Present) abundance and biomass trends in each pool. Data from these surveys are currently being processed and will be available for the January MRWG meeting for several upstream pools.

Acoustic telemetry stationary receivers throughout the Illinois River (Dresden Island Pool to Alton Pool) were downloaded between November 13th and the 17th. This completed telemetry field work for 2017. Updates were sent to agencies involved in acoustic telemetry providing them with a list of SIU's 2017 tag detections belonging to each group. Four upstream passages were detected at gated dams in 2017. All upstream gated dam passages were by fishes visually identified as Bighead Carp (two tagged by USACE, one tagged by SIU). One individual moved from Starved Rock Pool to Dresden Island Pool meaning that it passed through Marseilles and Dresden Island dams. The other two passages were upstream through Dresden Island Lock and Dam.

Acoustic telemetry data from Dresden Island Pool before (2 weeks before), during, and after (2 weeks after) the unified fishing event in this pool was analyzed. SIU has four stationary receivers in Dresden Island Pool and only two of these had detections of tagged fish during the five week period (receiver in Dresden Island Lock and Dam and receiver on a mooring cell approximately 0.5 mi downstream of Brandon Road Lock and Dam. Only five tagged Asian carp (3 Bighead Carp and 2 Grass Carp) were detected on SIU's receivers during the five week period examined and only four of these were detected during the unified fishing event (Figure 1). Post-unified fishing detections of tagged Asian carp appeared to decline after unified fishing. Also, only one individual was detected during the two weeks examined, indicating that Asian carp may have been redistributed by the unified event. Not enough detections are available from SIU's telemetry data to examine the response of individual Asian carp to unified fishing herding but SIU's detection data should be combined with other agencies' telemetry data from Dresden Island Pool to provide a better examination of the responses of Asian carps to unified fishing.

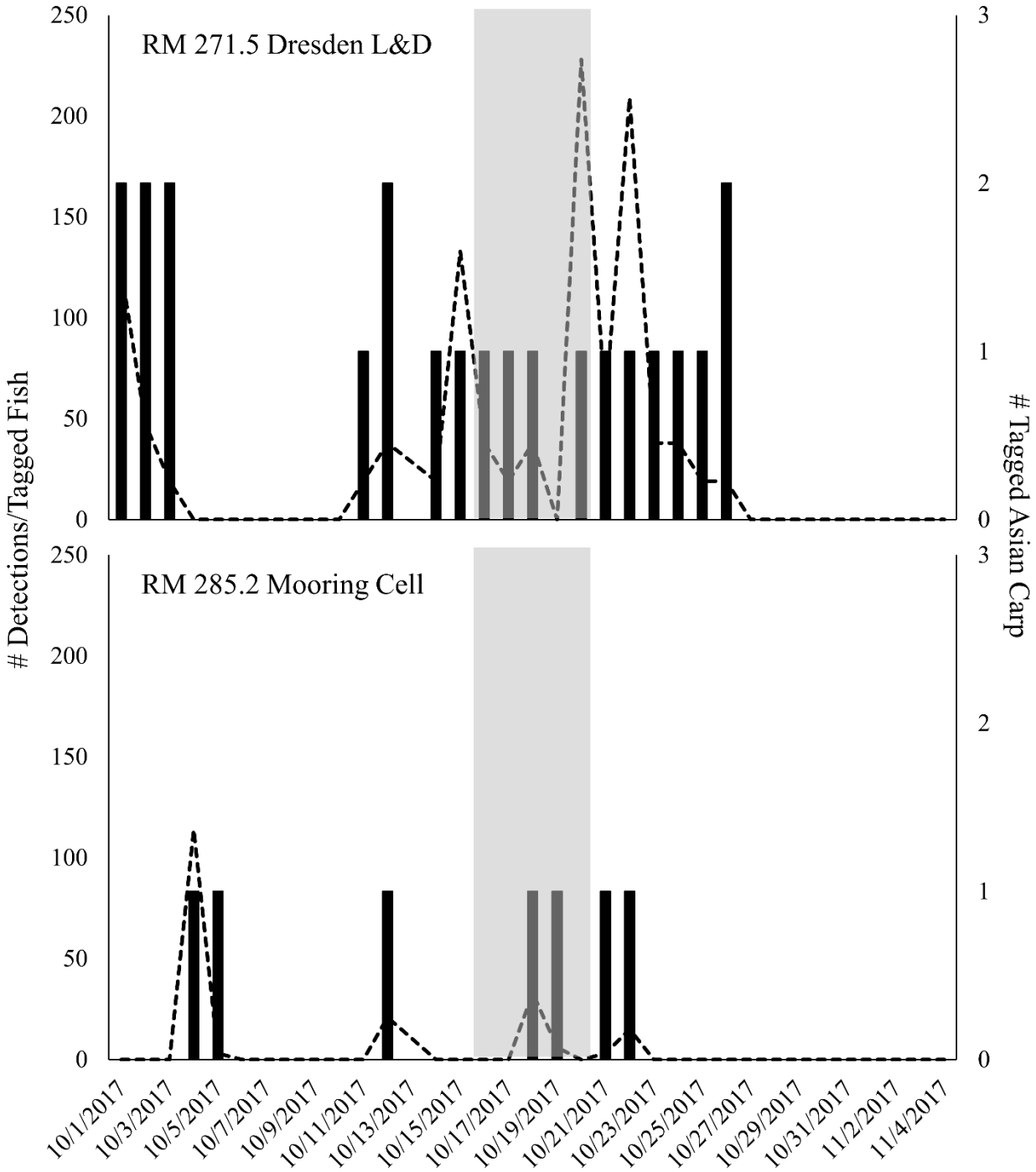


Figure 1. Number of detections (line) and number of Asian carp (bar) observed at two acoustic telemetry stationary receivers in Dresden Island Pool before, during (gray shaded area), and after unified fishing. The receiver at RM 271.5 (upper) is in Dresden Island Lock and Dam and reads both upstream and downstream of the lock when gates are open. The receiver at RM 285.2 is approximately 0.5 miles downstream from Brandon Road Lock and Dam attached to a mooring cell.