

**Lower Wisconsin River  
2011 Channel Catfish Hoop Net Survey  
(Arena Unit)**



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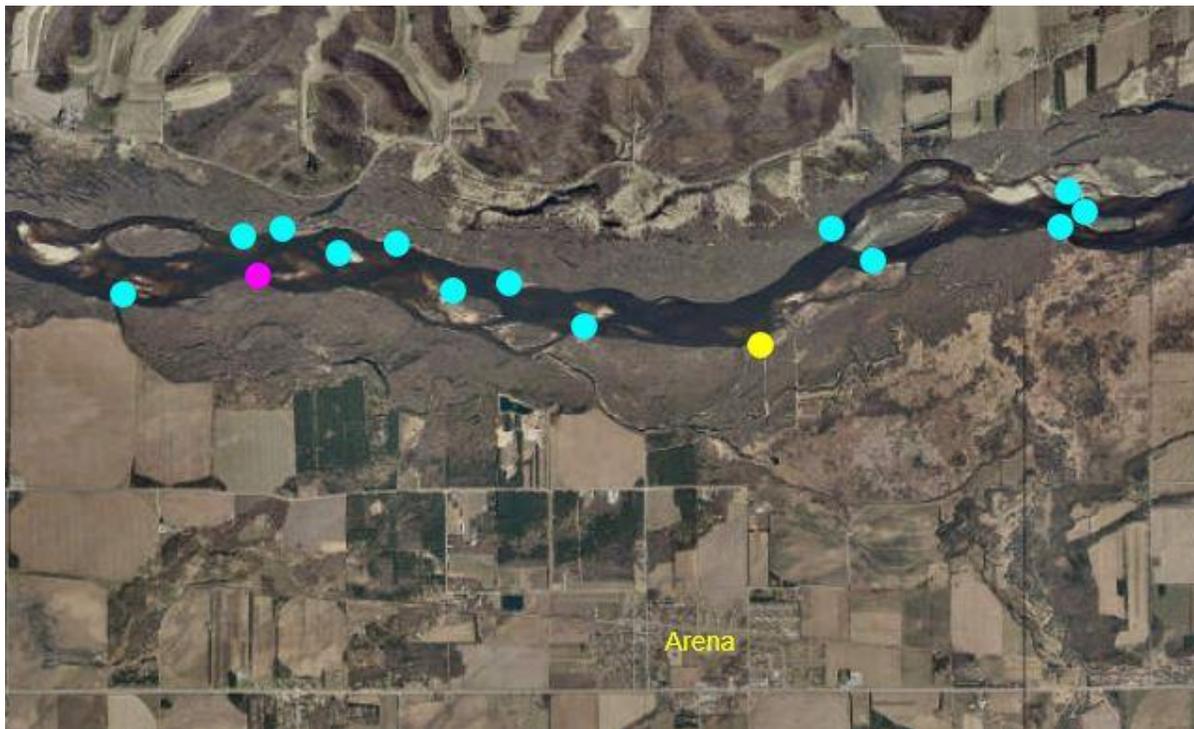
## **Introduction**

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The lower Wisconsin River is defined as the 92.3 mile portion flowing from the Prairie du Sac dam to the Mississippi River. The Wisconsin Department of Natural Resources Fisheries Management staff conducted a post spawn survey for channel catfish using baited hoop nets for a two week period in August of 2011. The purpose of the survey was to sample the channel catfish population for relative abundance and size structure.

### **Location**

The survey area was located on a 5 mile stretch of the lower Wisconsin River (Waterbody ID code: 1179900) near Arena, Wisconsin (Figure 1). Sauk County borders the north bank and Iowa County borders the south bank. The furthest upstream net (#12) was located approximately 1.75 miles above the Arena boat landing at latitude 43.19583, longitude 89.86963. The furthest downstream net (#8) was located approximately 3.25 miles downstream of the Arena boat landing at latitude 43.18991N, longitude 89.96356. Coordinates for all nets are in table 1.



**Figure 1.** 2011 channel catfish survey area and netting locations. Yellow dot represents location of Arena boat landing. Blue dots represent net locations. Dark pink dot represents relocation of net number 1.

### **Physical Characteristics**

The Wisconsin River as it flows through the survey area is a braided channel stream. Substrate is mostly sand with small isolated areas of gravel. Habitat within the survey area is diverse with islands, tributaries, connected backwaters, exposed root complexes, fallen trees, flooded vegetation, and mid-channel sand breaks and flats creating diverse water contours and flow regimes.

Within the survey area, the bank to bank channel width ranged from 750 to 2,325 feet with an average bank to bank channel width of 1,547 feet. Values are digitized measurements taken from the 2010 leaf off aerial photo.

Water temperature was recorded using the YSI pro2030 dissolved oxygen meter. Temperature was recorded in degrees Celsius. Mean daily water temperature for week 1 ranged 22.9°C to 24.1°C with a mean of 23.4°C. Mean daily water temperature for week two ranged 22.6°C to 23.8°C with a mean of 23.5°C.

Mean daily flow rates for the lower river during the first week of the survey ranged from 5340 cfs to 8280 cfs. The highest mean daily flow was on the first day and decreased to the low of 5340 cfs on day five. Mean daily flow rates during the second week of the survey ranged from 4590 cfs to 5700 cfs. The highest mean daily flow was on day three. The lowest mean daily flow was on day one. Values for mean daily flow rates were taken from the USGS gauging station number 05407000 located at Muscoda, Wisconsin, 27 miles downstream of the survey area. While the actual flows within the survey area may not be represented by flows measured at Muscoda, trends for daily fluctuations are.

## Methods

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Channel catfish were sampled during two 5 day periods in 2011. The first 5 day period started August 15 and ended August 19. The second 5 day period started August 22 and ended August 26. Thirteen hoop nets were set each 5 day period for a total effort of 104 net nights. Hoop nets consisted of two different sizes. The large hoop net has seven hoops tapering in size from 41 inches to 34 inches outside diameter with a mesh size of one-inch bar. The small hoop net has five hoops tapering in size from 29 inches to 24 outside diameter with a mesh size of one-inch bar. Hoop material is fiberglass. Netting material is a treated nylon. Two crowfoot style throats were attached to the second and fourth hoops for both the large and small hoop nets.

**Table 1.** Latitude and longitude coordinates and size of hoop nets.

Net number	Latitude	Longitude	Diameter of first hoop (inches)	Total number of hoops	Bar measurement of mesh (inches)
<b>1</b>	43.18745	89.91877	29	5	1
<b>1A*</b>	43.19159	89.95143	29	5	1
<b>2</b>	43.19117	89.92557	29	5	1
<b>3</b>	43.19008	89.93084	29	5	1
<b>4</b>	43.19373	89.93662	41	7	1
<b>5</b>	43.19280	89.94271	41	7	1
<b>6</b>	43.19458	89.94881	41	7	1
<b>7</b>	43.19428	89.95206	41	7	1
<b>8</b>	43.18991	89.96356	41	7	1
<b>9</b>	43.19183	89.89086	41	7	1
<b>10</b>	43.19489	89.87284	41	7	1
<b>11</b>	43.19661	89.87138	41	7	1
<b>12</b>	43.19583	89.6963	41	7	1
<b>13</b>	43.19432	89.89459	41	7	1

\*Hoop number 1 was moved for the second week of the survey. This location is designated 1A.

Hoop nets were set parallel with the current having the mouth pointed downstream. Depth of sets varied from 3 feet to 7 feet. Net locations were chosen to optimize catch rates. Nets were set in current runs in mid-channel, along flooded grass banks, banks with willow tree root complexes, and along banks having large amounts of woody habitat. Nets were anchored on the upstream end tied to 3/4 inch 4 foot steel rod which was driven into the substrate. The nets were stretched tight and anchored on the downstream end using a 7 x11 inch steel plate. The steel plates were attached to the net using 45 feet of 3/8 inch nylon rope. Nets were retrieved pulling up the downstream anchor rope via a net drag. Nets were baited with 7.5 pounds of pressed soy cake meal, dried. Bait was placed loose in the pot end of net. Additional bait was placed in each net as needed.

Channel catfish and flathead catfish were weighed to the nearest twenty-five hundredths of a pound. Total length was measured to the nearest tenth of an inch. Other species present in the nets were only noted.

## **Results and Discussion**

A total of 1,142 channel catfish were collected (Table 2.). Two-hundred forty five were collected in week one and 897 were collected in week two. Total Catch per effort for channel catfish sampled was 10.98 channel catfish per net night. Week one catch per effort was 2.35 channel catfish per net night. Week two catch per effort was 8.62 channel catfish per net night. Flathead catfish were not as abundant with only 9 flathead catfish sampled for a total catch per effort of 0.08 flathead catfish per net night. Two flathead catfish were sampled in week one for a catch per effort of 0.08 per net night. Seven flathead catfish were sampled in week two for a catch per effort of 0.06 per net night.

**Table 2.** Catch summary of channel and flathead catfish during the 2011 lower Wisconsin River baited hoop net surveys

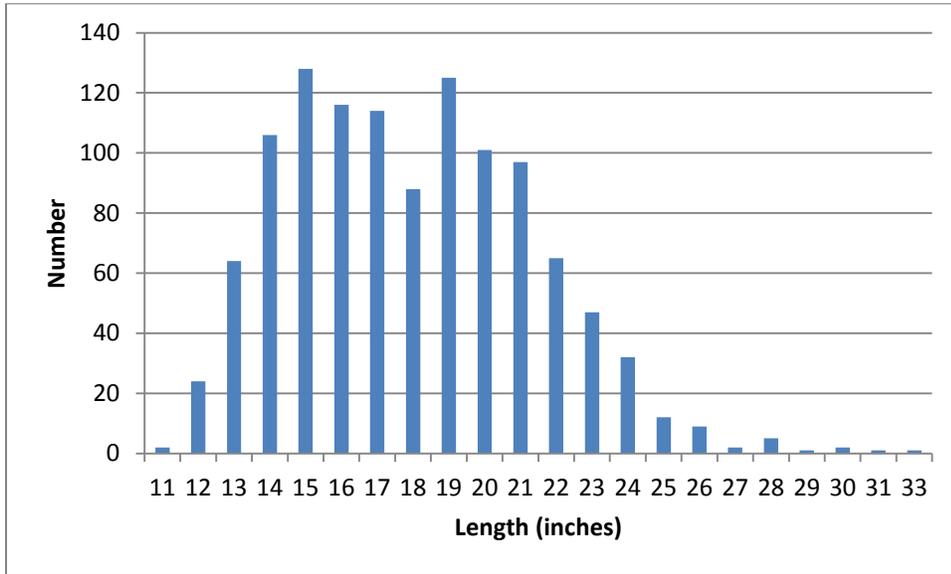
Species	Total Number Collected	Number Collected Week 1	Number Collected Week 2	CPUE Total*	CPUE Week 1*	CPUE Week 2*
Channel Catfish	1142	245	897	10.98	2.35	8.62
Flathead Catfish	9	2	7	0.08	0.01	0.06

\*CPUE reported as mean number per net night

Total length for channel catfish ranged from 11.7 to 33.4 inches with a mean of 18.4 inches (Table 3.). A length frequency distribution is displayed in figure 2. Channel catfish with a total length of 16.0 inches or greater made up 71% of the total number of channel catfish sampled for a PSD value of 71 (Table 4.). Relative stock density values for channel catfish with a total length of 24, 28, and 36 inches or greater ( $RSD_{24}$ ,  $RSD_{28}$ , and  $RSD_{36}$ ) were 5.0, 0.88, and 0 respectively.

Length summary data for flathead catfish is also given in table 3. Total length for flathead catfish ranged from 20.8 to 43.0 inches with mean of 33.6. Due to the low sample size, PSD and RSD values were not calculated for flathead catfish.

**Figure 2.** Length frequency of channel catfish, 2011 hoop net survey, Wisconsin River, Arena unit



**Table 3.** Length summary of channel and flathead catfish during the 2011 lower Wisconsin River baited hoop net surveys. Channel catfish (n=1142), Flathead catfish (n=9)

Species	Mean Length (inches)	Minimum Length (inches)	Maximum Length (inches)
Channel Catfish	18.4	11.7	33.4
Flathead Catfish	33.6	20.8	43.0

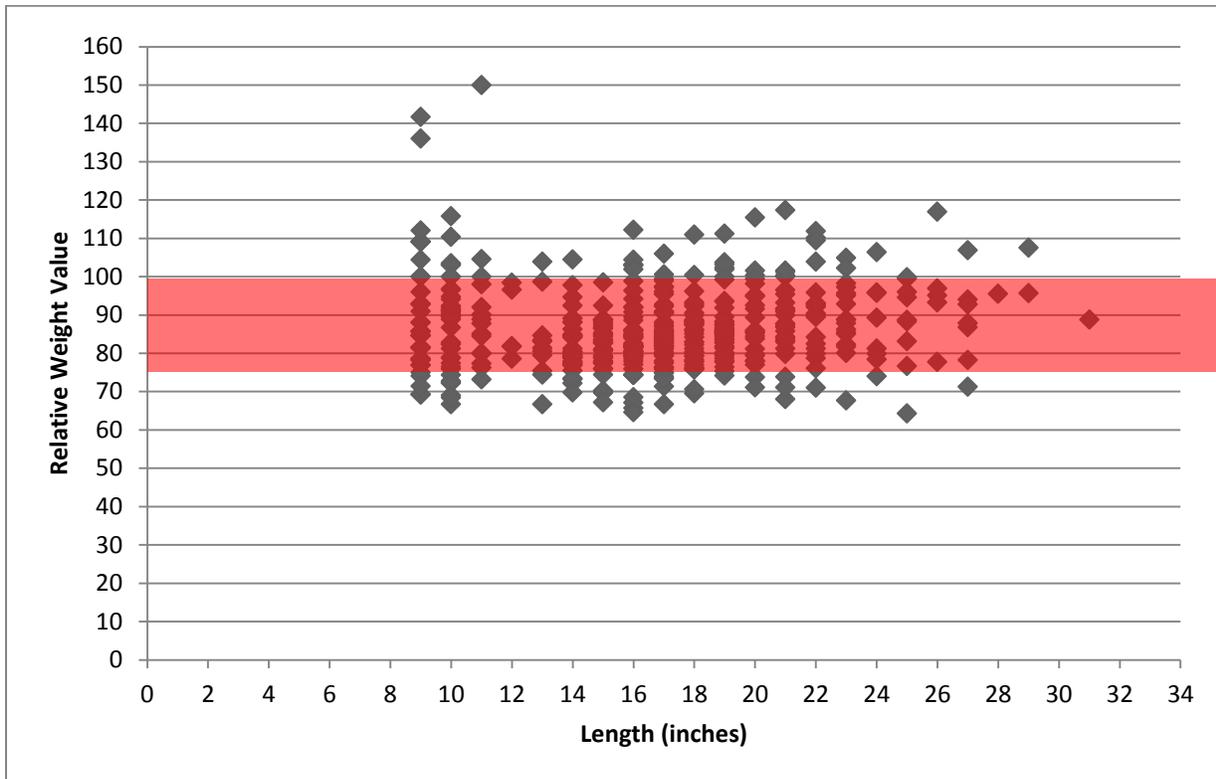
**Table 4.** Proportional Stock Density (PSD) and Relative Stock Density (RSD) values for channel catfish during the 2011 lower Wisconsin River baited hoop net surveys. (n=1142)

Species	PSD	RSD <sub>24</sub> Preferred	RSD <sub>28</sub> Memorable	RSD <sub>36</sub> Trophy
Channel Catfish	71	5	0.88	0

Weight in pounds was recorded for 1,139 of the channel catfish sampled and 7 of the flathead catfish. Channel catfish weights ranged from 0.75 to 18.0 pounds with a mean of 2.4. Flathead catfish weights ranged from 3.0 to 28.0 pounds with a mean of 22.4.

Relative weight is used as a condition assessment tool for fish populations. Relative weight ( $W_r$ ) is calculated with the following formula:  $W_r = (W/W_s \times 100)$  where  $W$  is the recorded fish weight and  $W_s$  is the standard weight for fish of the same length. Value of 100 is optimal. The length specific standard weight ( $W_s$ ) for channel catfish was determined using the equation developed by Brown et al., 1995. Channel catfish relative weight values ranged from 60.5 to 163.9 with a mean of 97.3. Relative weight at length is plotted for channel catfish in figure 3. Due to the low sample size, relative weights for flathead catfish were not analyzed.

**Figure 3.** Relative weight at length for channel catfish, 2011 hoop net survey, Wisconsin River, Arena unit. Average condition values (75-100) are shaded red.



**Table 5.** Weight and relative weight summaries of channel and flathead catfish during the 2011 lower Wisconsin River baited hoop net surveys. Channel catfish (n=1139), Flathead catfish (n=7)

Species	Mean Weight (lbs.)	Minimum Weight (lbs.)	Maximum Weight (lbs.)	Mean Relative Weight	Minimum Relative Weight Value	Maximum Relative Weight Value
Channel Catfish	2.4	0.75	18.0	97.3	60.5	163.9
Flathead Catfish	22.4	3.0	28.0	NA	NA	NA

## **Management Goals and Recommendations**

The population remains stable with abundant number of channel catfish, good size structure, and good condition. The lower Wisconsin River offers anglers above average opportunities to catch and harvest channel catfish of various sizes. The current management goal is to maintain the current status of this fishery. The current regulation is no size limit with a daily bag limit of 10. No changes are recommended at this time.

**Monitoring:** Continue to monitor the channel catfish fish population using standard hoop netting techniques. With stable channel catfish populations a survey frequency of once in 4 to 5 years would be sufficient. With the low numbers in the summer netting surveys, it is recommended that alternate methods be analyzed to sample flathead catfish. Alternate methods may include sampling overwintering areas, hoop netting during spring migration, or hook and line methods.

**Habitat:** In 1989 act 31 established the Lower Wisconsin State Riverway to protect the aesthetic integrity and natural environment of the lower Wisconsin River and surrounding valley. The Riverway covers over 79,000 acres and lower 92.3 miles of waterway. Because of this protection, the river and adjoining habitats are in good condition and stable.

**Access:** Adequate access is available with multiple launches and bank fishing opportunities.

## **References**

Brown, M. L., F. Jarmillo, Jr., D. M. Gatlin, III, and B. R. Murphy. A revised standard weight (Ws) equation for channel catfish. *J. Fresh. Ecol*, 10: **295-302 (1995)**.