Report on 2005 Placement of Cages Containing *Lampsilis higginsii* in the Wisconsin River near Orion and in Woodman Lake.

Wisconsin Department of Natural Resources
and
U. S. Fish and Wildlife Service, Genoa National Fish Hatchery

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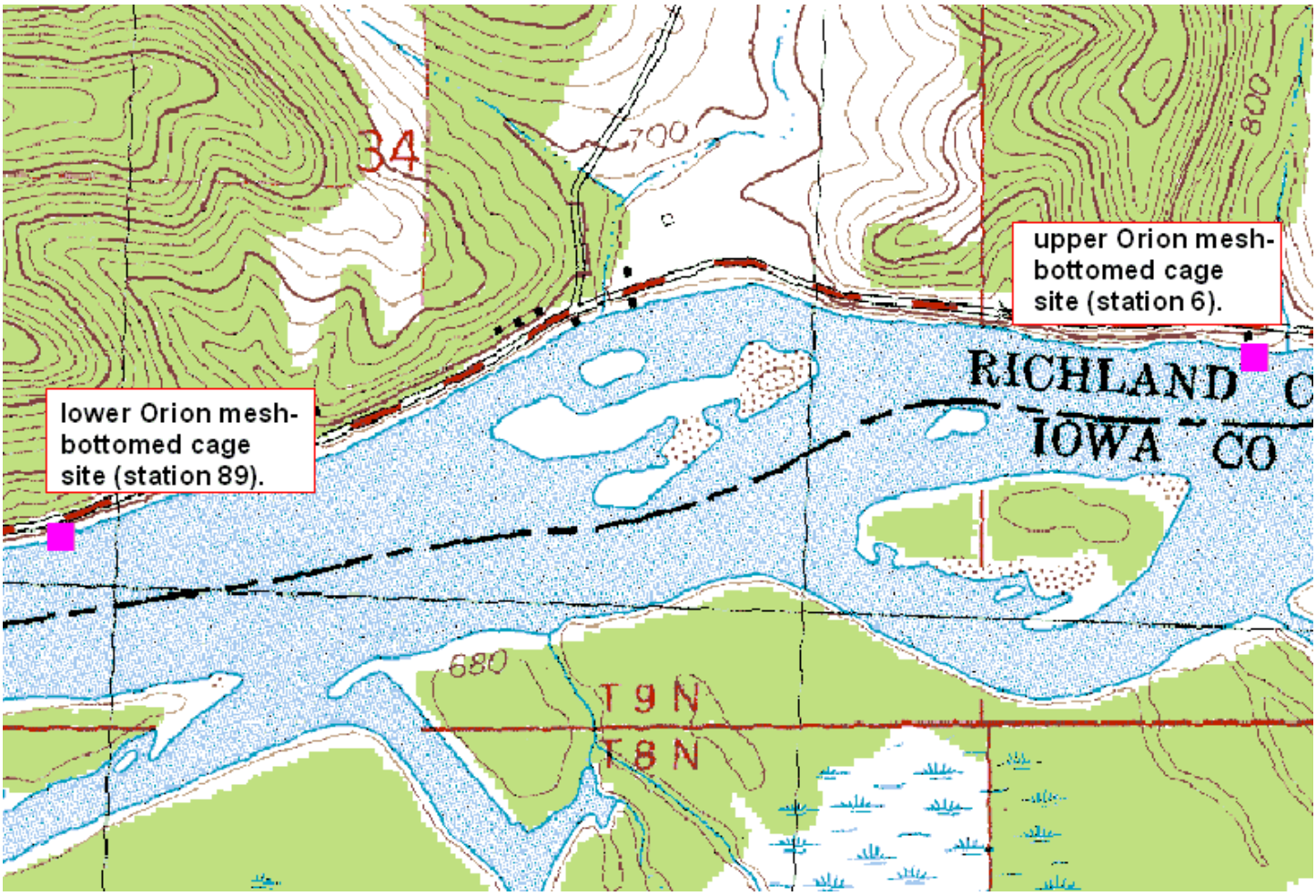
This report summarizes the 2005 placement and removal of caged fish containing glochidia of *Lampsilis higginsii* in the Wisconsin River, near Orion and Woodman Lake, as well as the release of free-ranging fish near Prairie du Sac, Wisconsin. This effort was part of mussel propagation related to the reauthorization of the Mississippi River System Navigation project by the U. S. Army Corps of Engineers in cooperation with an associated team known as the Mussel Coordination Team.

Persons involved in the 2005 placement were staff from the Wisconsin Department of Natural Resources and staff from the U. S. Fish and Wildlife Service, Genoa National Fish Hatchery.

During 24 May 2005, 9 mesh-bottomed cages were placed at Wisconsin river mile 48.42 (T9N, R1E, Sec. 34, NE of SW of SW, 43° 12’ 28.6” N, 90° 21’ 59.8” W), 8 m off right descending bank, Richland County, Wisconsin. All cages were placed within several meters of each other, in a line about 20m downstream of some obvious shoreline rip-rap associated with State Highway 60 (Figure 1). In these cages were placed 225 largemouth bass containing an estimated 80,753 *L. higginsii* transformers from females obtained from the Mississippi River at Cassville, Wisconsin. Fish here inoculated on 2 May 2005 at the Genoa National Fish Hatchery.

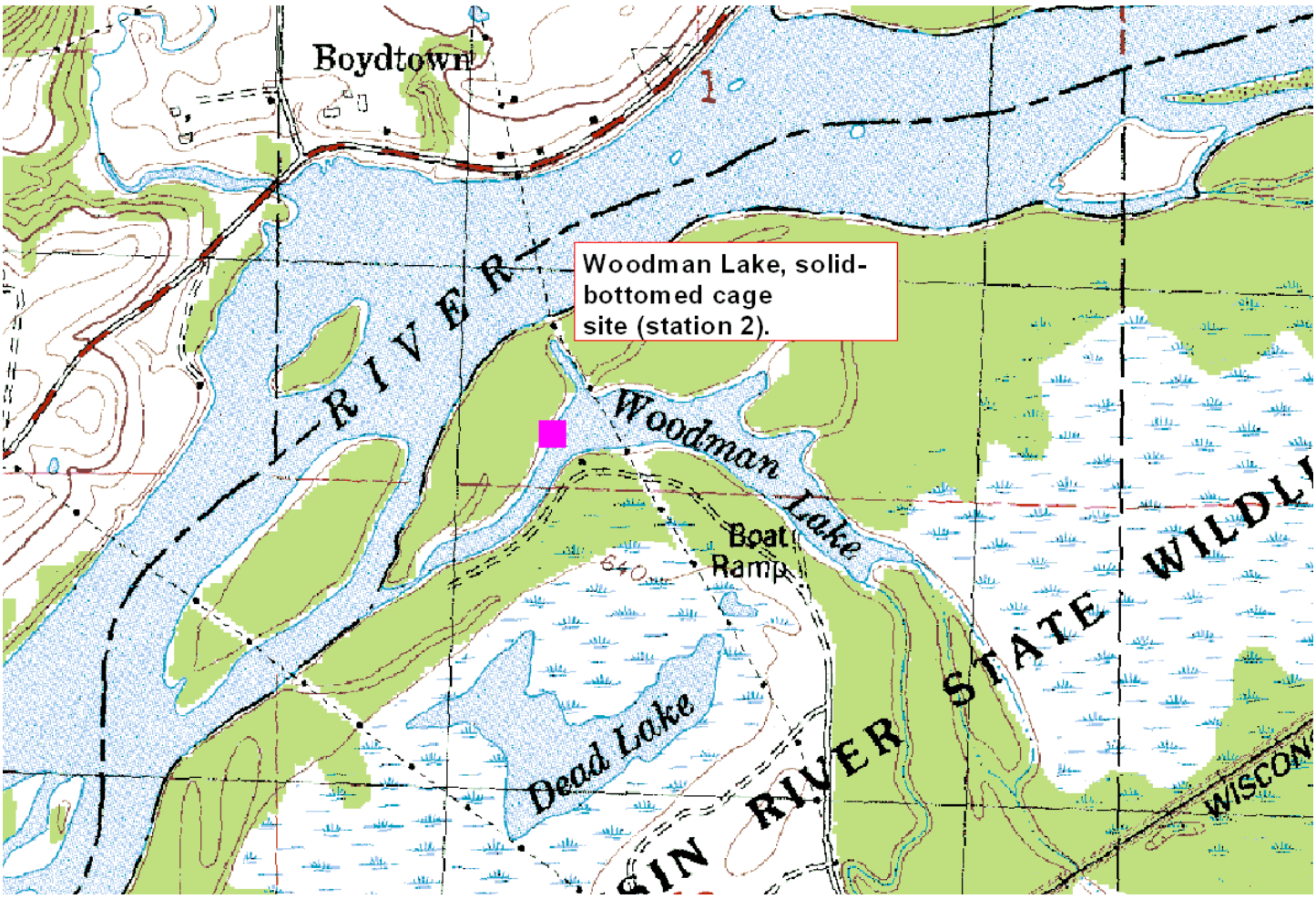
Figure 1. Location of 2005 Orion Mesh-bottomed Cage Sites.



During 24 May 2005, 14 mesh-bottomed cages were placed at Wisconsin river mile 49.5 (T9N, R1E, Sec. 35, SW of NE of SW, 43º 12' 37.3"N, 90º 20' 43.2" W), 10 m off right descending bank, Richland County, Wisconsin. All cages were placed within several meters of each other, in lines about 5m downstream of a large rock adjacent to a cabin (Figure 1). In these cages were placed 350 largemouth mouth bass containing an estimated 125,615 transformers from females obtained from the Mississippi River at Cassville, Wisconsin. Fish here inoculated on 2 May 2005 at the Genoa National Fish Hatchery.

During 24 May 2005, 7 solid-bottomed cages were placed in Woodman Lake, at Wisconsin river mile 22.7 (T7N, R4E, Sec. 1, SW of SE of SW, 43º 06' 20.0"N, 90º 46' 52.9"W), 5m off the northwest bank, Grant County, Wisconsin. All cages were placed within a few meters of each other at varying depths (Figure 2). In these 7 cages were placed 234 largemouth bass containing an estimated 83,983 transformers from females obtained from the Mississippi River at Cassville, Wisconsin. A summary of cage placement information is given in Table 1.

Figure 2. Location of 2005 Woodman Lake solid-bottomed Cage Site.



On 18 May 2005, 410 smallmouth bass containing an estimated 41,205 glochidial transformers were release at Wisconsin river mile 89.16 (T9N, R6E, Sec. 12, NE of NE of SE, 43º 16’ 10.6“N, 89º 43’ 17.9”W), off the right descending bank, Sauk County, Wisconsin (Figure 3).

Figure 3. Location of Prairie du Sac 2005 Free-Release Fish Site.

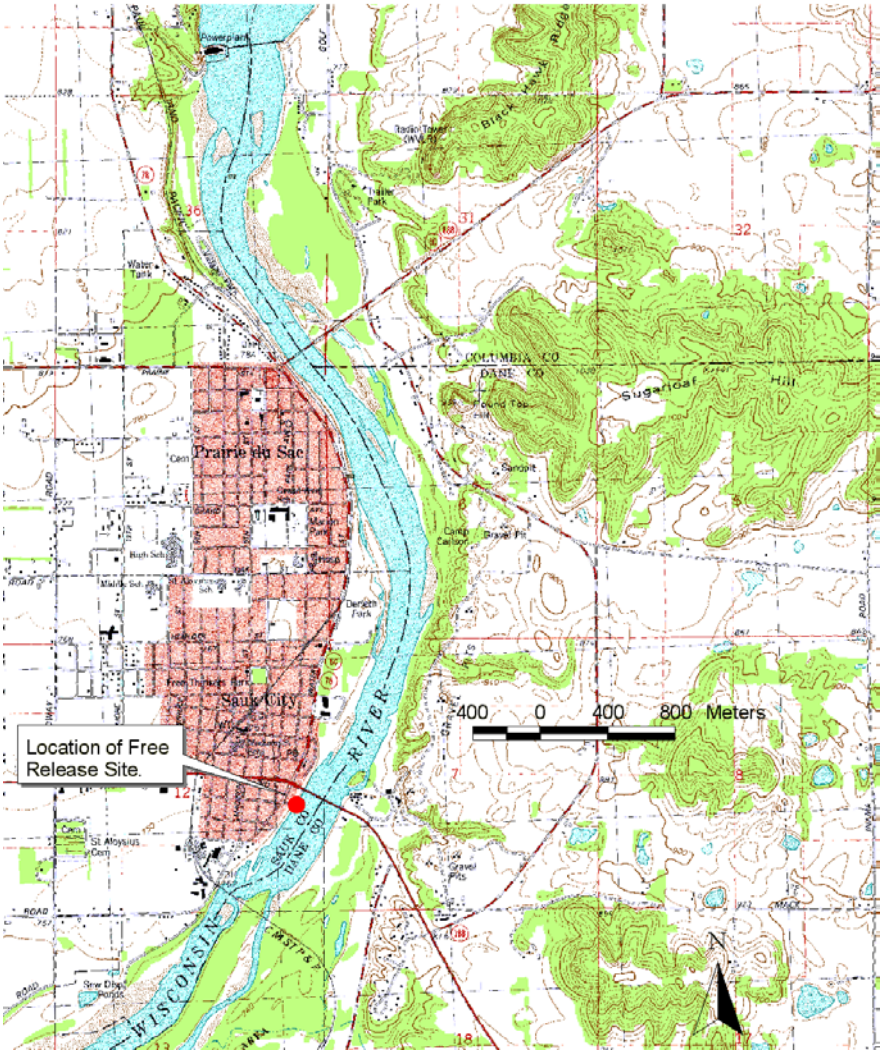


Table 1. Location, Date of Release, Release Method, Number of Each Fish Species and Population Strain for Propagated *L. higginsii* Released into the Wisconsin River, Wisconsin from 2005.

LOCATION	STA-TION	RIVER MILE	DATE OF RELEASE	LATITUDE LONGITUDE	METHOD (# OF CAGES)	FISH SPECIES	# OF FISH	EST. # OF *L. HIGGINSII* TRANS-FORMERS	MUSSEL "STRAIN"
Orion	89	48.42	24 May 2005	43º12'28.6" 90º21'59.8"	Mesh-bottomed cages (9)	*M. salmoides*	225	80753	Cassville
Orion	6	49.5	24 May 2005	43º12'37.3 "90º20'43.2"	Mesh-bottomed cages (14)	*M. salmoides*	350	125615	Cassville
Woodman L.	2	22.7	24 May 2005	43º06'20.0" 90º47'52.9"	Solid-bottomed cages (7)	*M. salmoides*	234	83983	Cassville
Prairie du Sac	68	89.16	18 May 2005	43º16'10.6" 89º43'17.9"	Free release	*M. dolomieu*	410	41205	Cassville

On 21 June 2005, 28 days after placement, the 20 remaining Orion mesh-bottomed cages were removed. Apparently, a total of three, all from one station, were previously removed, two probably due to human interference. We know that the third was removed on or about 6 June by conservation wardens. Living and dead largemouth bass were counted and an estimate was made of number of attached glochidia from a subsample of 8 surviving fish. The fish were released into the river.

In these 20 cages were found 119 living and 1 dead largemouth bass. These 119 living fish represent 20.7% of the 575 fish placed in these cages. The remaining fish were lost from the three previously removed cages, had escaped, or died within the remaining cages. On a subsample of 8 living fish, we found no attached glochidia.

On 21 June 2005, 28 days after placement, the 7 Woodman Lake solid-bottomed cages were opened underwater and the fish were allowed to escape. We were not able to count all fish present due to poor visibility, but we saw a total of 11 fish in these cages. The cages were re-closed after waiting at least 20 minutes.

On 31 August 2005, 99 days after placement, the 7 Woodman Lake solid-bottomed cages were removed from the water. In these cages we found a total of 375 juvenile *L. higginsii*, 21 *Toxolasma parvus*, and one *Leptodea fragilis* (Table 2). These 375 *L. higginsii* represent 0.45% of the estimated number of transformers placed in these cages. *L. higginsii* production was closely related to water depth over the cage. Over 99.7% of the *L. higginsii* produced were in water less than 1.1m deep on the day of removal. Only one *L. higginsii* was produced deeper. Cages that were in deeper water contained visibly more foul-smelling organic material that accumulated during these 99 days. The mean total length of recovered *L. higginsii* from a random subsample was 9.68mm (STD=2.35; Minimum=4.00; Maximum=15.00, n=90). Specimens from the other two species were also very small. All *L. higginsii* were consolidated into two cages. These two cages were returned to a depth of 1m.

Table 2. Woodman Lake Solid-Bottomed Cage Results. Number of Each Mussel Species, Depth and Cage Number. 31 August 2005.

DEPTH (M) ON 31 AUG. 2005	CAGE NUMBER	NUMBER OF L. HIGGINSII LIVE	NUMBER OF T. PARVUS LIVE	NUMBER OF L. FRAGILIS LIVE
1.05	1	97	1	1
1.05	2	128	0	0
1.05	7	149	5	0
1.35	3	0	13	0
1.55	5	1	0	0
1.65	4	0	2	0
1.78	6	0	0	0
TOTAL		375	21	1