

**Mudpuppy (*Necturus*) Survey
at the
Cedar Wapsi (C-57) Bridge
Over the Cedar River
in Black Hawk County, Iowa**

H&A # 1608b

Prepared for
Stantec Consulting Services, Inc.
Independence, Iowa

On behalf of
Black Hawk County Engineer's Office
Waterloo, Iowa

Prepared by

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Sara J. Hankemeier
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Helms & Associates
Bellevue, Iowa

December 2016

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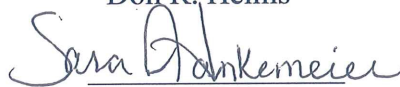
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The Cedar Wapsi (C-57) Bridge over the Cedar River viewed from downstream

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**View of the Cedar Wapsi (C-57) Bridge over the Cedar River in Black Hawk County, Iowa
from the landing upstream on right (west) bank**

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1.0 INTRODUCTION

This report is for a Mudpuppy (*Necturus maculosus*) presence/probable absence survey at the Cedar Wapsi (C-57) Bridge over the Cedar River in Black Hawk County, Iowa (N 41.925787°, W 91.550965°) (Figure 1). Of particular significance at this site is the potential presence of state (Iowa) threatened mudpuppy (*Necturus maculosus*).

The Cedar River at this location has an approximate width of 400 ft. In late June, a mussel survey was conducted in this area (Helms and Associates 2016). That survey extended from 50 ft upstream to 250 ft downstream of the present bridge (Figure 2). The mudpuppy study encompassed a similar area, while concentrating on habitat suitable for mudpuppies.

Their habitat preference is medium to large rivers and lakes. They are usually found in permanent water bodies at least three feet deep, and prefer to live on the floor of their aquatic habitat under sunken logs or rocks. Their range in Iowa is shown in Figure 3.

This work was conducted under contract with the Stantec Consulting Services, Inc., Independence, Iowa on behalf of the Black Hawk County Engineer's Office, Waterloo, Iowa.

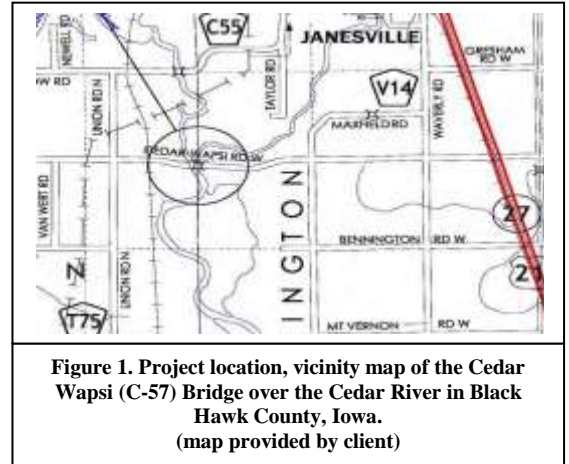


Figure 2. Sampling locations at the Cedar Wapsi (C-57) Bridge over the Cedar River in Black Hawk County, Iowa. Green locations indicate where mussels were found.

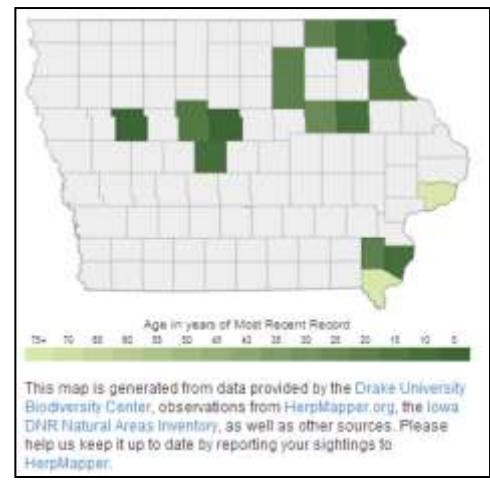


Figure 3. Mudpuppy range in Iowa (https://www.iowaherps.com/species/necturus_maculosus)

2.0 METHODOLOGY

A preliminary search effort was coupled with the mussel survey conducted June 27 through 29. That survey consisted of both substrate sampling and five-minute timed searches at each of 30 locations (Figure 2). In addition, we conducted a 90-minute search along the entire west bank where substrate consisted of large glacial boulders. These had apparently been placed for bank protection.

During the timed searches, preliminary observations were made in anticipation of conducting the mudpuppy survey. The diver visually searched for the presence of mudpuppies, and noted potential sites with crevasses and cavities where mudpuppies may reside. Habitat which we judged suitable consisted of large glacial boulders along the west bank, snag piles at the upstream ends of bridge piers and near the east end of the bridge, as well as cut banks downstream of the bridge along the east bank.

In visiting with Mr. Kevin Hanson, an Iowa DNR biologist¹ who has experience collecting mudpuppies in the Mississippi River near Guttenberg, we gained information regarding his methods and seasonal success in collecting mudpuppies. It was his experience that success increased in the fall during low water temperatures. Thus, we targeted the fall for our collection trip.

Based on our mussel survey experience at the site, we felt river flows needed to be at 5,000 cubic feet per second (cfs) or less at USGS 05463050 Cedar River at Cedar Falls, IA². The Cedar Falls gage station is the nearest downstream gage station from the site.

Sampling and observations for the mudpuppy study consisted of using traps and visual searches. The traps as shown in Figure 4 were the same (American Maple Promar Minnow Medium Trap: MEDI) as those used by Mr. Hanson in his work at Guttenberg. We used 20 traps baited with minnows, most of which were crushed per Mr. Hanson's instructions.

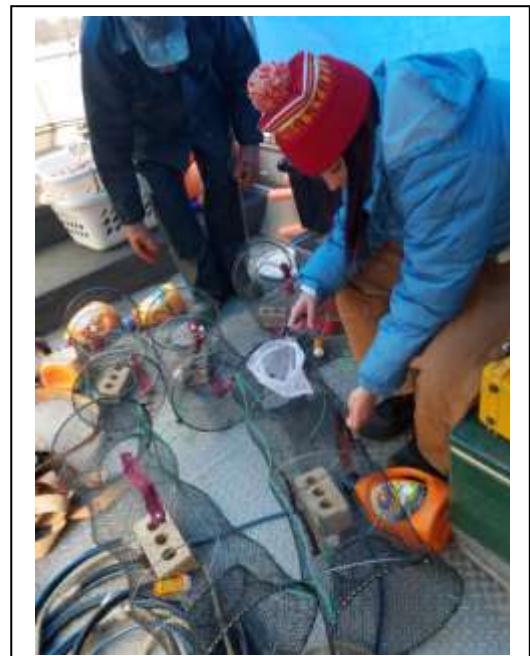


Figure 4. Crew preparing one of 20 traps to set at the Cedar Wapsi (C-57) Bridge over the Cedar River _114718.

¹ Personal communication June 2, 2016

² http://waterdata.usgs.gov/ia/nwis/uv?site_no=05463050

Ten traps were set along the west bank, within and adjacent to the glacial boulders in that area. Three were set among snags and woody debris near the bridge piers. The remaining seven traps were set along the east bank among woody debris and snags and/or near the undercut roots along the east shore. Traps were set on November 22 and picked up the next day.

During the evening of November 22, we conducted night diving. For this procedure, the diver was equipped with lights and a GoPro Hero4 Black camera mounted on his dive helmet. The camera recorded continuously during the dive. The diver was also in continuous voice communications via on his umbilical line.

Three 30-minute dives were conducted. The first two 30-minute dive sessions were conducted along the west bank among and adjacent to the glacial boulders. The third started near the bridge piers along the east bank among snags and woody debris and continued along the east bank where habitat was previously determined to include an array of logs and undercut roots along the shore. Photos of traps and the bridge area with associated habitat are presented in Appendix A.

3.0 RESULTS

3.1 Physical Parameters

During the June mussel survey, we determined that substrate throughout most of the area was loose shifting sand with small amounts of gravel and/or mud. The bridge piers generally were with minimal or no scour protection, and sand often continued to their bases. There was considerable brush lodged on some of the piers. The west bank had scour protection consisting of large glacial boulders. While the east bank, without protection, consisted of mud, woody debris, and tree root masses. Several large overhanging trees extended into the water along both west and east banks. Photos of these habitats are presented in Appendix A.

Based on these observations, we concluded that the best mudpuppy habitat was among the glacial boulders along the west bank. Marginal habitat was also present among the snags and woody debris at the upstream points of the bridge piers and along the east bank where there existed undercut banks among shoreline tree roots.

When mussel sampling was completed June 27 through June 29, 2016, discharge ranged between 7,360 cfs and 5,490 cfs, and corresponding gage height was 83.09 feet (846.09 mean sea level (m.s.l.) and 82.14 feet (845.14 m.s.l.). Observed depths ranged from 3.4 to 9.5 feet. Secchi disk readings ranged from 13 to 23 inches. Water temperature was 68 ° F, and air temperature ranged between 68 and 75 ° F.

By comparison, at the time of the fall (November 22 and 23) mudpuppy survey, discharge was 4,220 cfs and gage height was 81.03 feet (844.03 m.s.l.). Secchi disk measured 48 inches. Air temperature was 38 ° F, and water temperature was 37 ° F.

The fall conditions were as expected with flows and temperatures reduced, and visibility increased. Discharge during the two study periods is shown in Figure 5.

3.2 Mussel survey diving observations

A total of 4 hours and 35 minutes (90 minutes of dive observations along the west bank and 185 minutes throughout the area during the remaining mussel survey) were expended in searching during the June mussel survey.

Observations during these timed searches were also used to document preliminary

information for use in this mudpuppy study which was subsequently conducted in the fall when water temperature was more appropriate for mudpuppy observations. The 90-minute search along the west bank, though used to gather mussels, was primarily to gather information regarding mudpuppies. This search was unproductive in locating mudpuppies as water was too turbid to make observations (secchi measured 13 inches). We did, however, note habitat and determined that this area would be a good location to set traps during our fall visit, which we did.

3.3 Trap results

We did not catch any mudpuppies in the 20 trap days of effort. Catch solely consisted of four northern leopard frogs and five large crayfish. Photos of a leopard frog and a crawfish are presented in Appendix A.

3.4 Night diving results

Diving was similarly unproductive. In 1.5 hours of night diving, we observed one northern leopard frog and a fleeting glimpse of a small fish. Habitat appeared to be suitable, particularly along

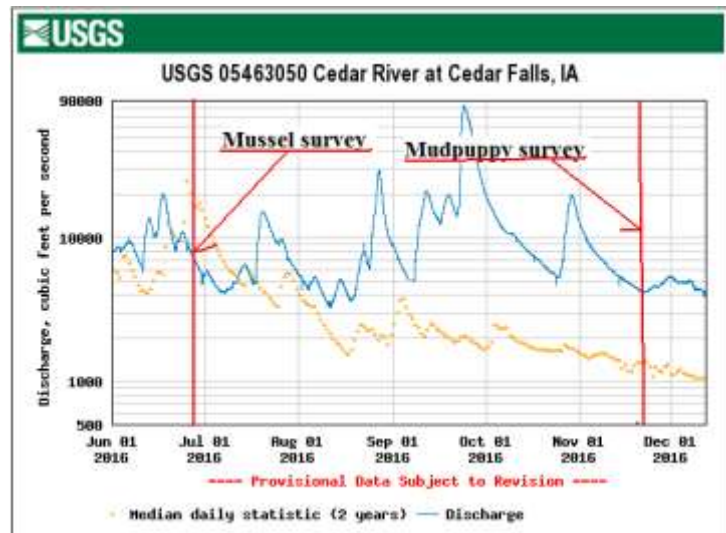


Figure 5. River discharge recorded at USGS 05463050 Cedar River at Cedar Falls, IA during the mussel and mudpuppy sampling by Helms & Associates.

the west bank where large glacial boulders created visible cavities between and beneath. Habitat along the east bank appeared less suitable with minimal presence of cavities and hiding spaces. We, however, did not venture into snag piles to a great extent for safety reasons. The diver did not want to enter into a situation at night where he could become entangled. These habitats were adequately covered by placement of traps within and nearby.

4.0 SUMMARY AND CONCLUSIONS

During the period of June 27 through June 29, 2016, we surveyed a 300 ft reach of the Cedar River (50 ft upstream to 250 ft downstream) of the Cedar Wapsi (C-57) Bridge in Black Hawk County, Iowa for mussels. At the same time, we gathered preliminary information for conducting a follow-up presence/absence survey for mudpuppies (*Necturus maculosus*). On November 22 and 23, we conducted the mudpuppy survey. We set 20 traps and conducted night dive observations expending 1.5 hours of dive time. None of these efforts were successful in collecting or observing mudpuppies at this site. Based on these results, we conclude that mudpuppies may be absent or are very sparse at this location and will not be significantly impacted by proposed bridge construction activities.

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6.0 APPENDICES

Appendix A. Mudpuppy survey photos taken at the Cedar Wapsi (C-57) Bridge over the Cedar River in Black Hawk County, Iowa by Helms & Associates November 2016. (5 pages)

Appendix A.

Mudpuppy survey photos taken at the Cedar Wapsi (C-57) Bridge over the Cedar River in Black Hawk County, Iowa by Helms & Associates November 2016.

**Appendix A.
Mudpuppy survey photos taken at the Cedar Wapsi (C-57)
Bridge over the Cedar River in Black Hawk County, Iowa
by Helms & Associates November 2016.**



**West bank of the Cedar River
downstream of the Cedar Wapsi (C-57)
Bridge _091224**



**East end of the Cedar Wapsi (C-57)
Bridge viewed from downstream
_092443**



**West bank of the Cedar River
downstream of the Cedar Wapsi (C-57)
Bridge showing glacial boulders
_092050**



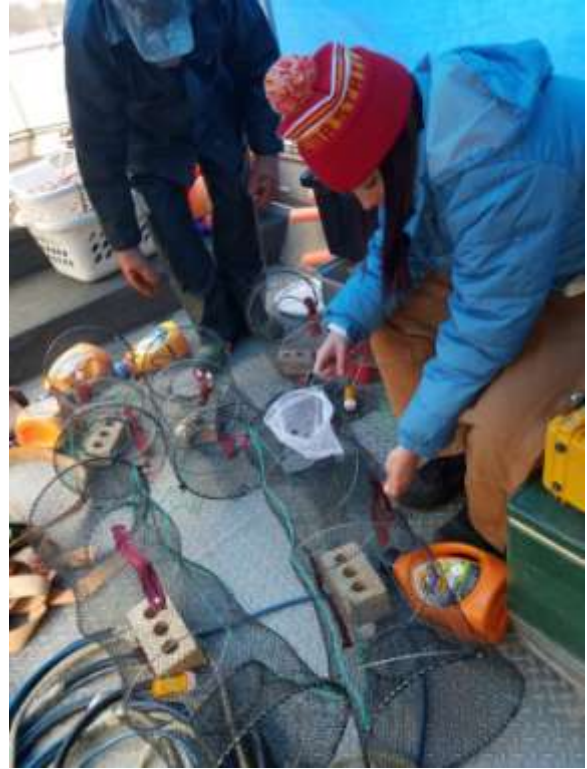
**East end of the Cedar Wapsi (C-57)
Bridge showing old pilings from a
previous bridge _092629**



**East bank of the Cedar River
downstream of the Cedar Wapsi (C-57)
Bridge viewed facing downstream
from the bridge_092636**



**East bank of the Cedar River
downstream of the Cedar Wapsi (C-57)
Bridge viewed from downstream of the
bridge_093439**



**Crew preparing traps to be set for
mudpuppies at the Cedar Wapsi (C-57)
Bridge_114718**



**Crew removing traps set for
mudpuppies at the Cedar Wapsi (C-57)
Bridge_090718**



**Crew removing traps be set for mudpuppies at the Cedar Wapsi (C-57)
Bridge_093829(0)**



**Crew removing traps set for mudpuppies at the Cedar Wapsi (C-57)
Bridge_093829**



**Rigging camera for observing mudpuppies at the Cedar Wapsi (C-57)
Bridge_203350**



**Preparing camera for observing mudpuppies at the Cedar Wapsi (C-57)
Bridge_204532**



Diver suiting up at the Cedar Wapsi (C-57) Bridge _204437



Diver entering water at the Cedar Wapsi (C-57) Bridge _200215



Watching diver at the Cedar Wapsi (C-57) Bridge _200538



Diver entering water at the Cedar Wapsi (C-57) Bridge _200207



Communicating with diver at the Cedar Wapsi (C-57) Bridge _190557



**Leopard frog collected from the Cedar River at Cedar Wapsi (C-57) Bridge
_095123**



**Regulator frosting up during dive at the Cedar Wapsi (C-57) Bridge
_200608**



Crayfish collected from the Cedar River at Cedar Wapsi (C-57) Bridge _095255