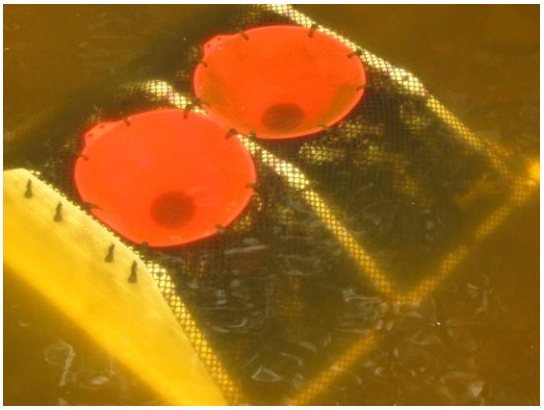
Rusty Crayfish (*Orconectes rusticus*) Trapping Study
Yellow River, Pittsville, Wisconsin
June 29th – July 31st, 2009



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In partnership with:
Wisconsin Department of Natural Resources
Wood County Land Conservation Department
University of Wisconsin – Stevens Point

Acknowledgements

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Purpose

The purpose of this trapping study was to determine whether it was feasible for a citizen group to trap rusty crayfish and effectively reduce their local population. Every effort was made to ensure that all equipment and techniques could be easily replicated by an average citizen.

Location

Three locations were identified as possible trapping sites. All three were on the Yellow River in Wood County, Wisconsin. Ideally, a site would have a "barrier" of unsuitable habitat on both the upstream and downstream sides, to minimize immigration and emigration at the trapping site. This would give a more accurate assessment of the impact on the local rusty crayfish population. However, this ideal situation proved difficult to find.

The first location identified was at North Wood County Park, 44.52011N, 90.14159W. The population was assessed by a simple question—how many rusty crayfish ("rusties") can two adults catch with dip nets in 10 minutes? At this location, Tracy Arnold, (Conservation Programs Coordinator, Wood County Land Conservation Department) and I caught 3 rusties and zero native crayfish.

Advantages to this location:

1) great, rocky habitat
2) Site was very easy to access, close to park road.

Disadvantages to this location:

1) Close proximity to park road could result in vandalism to traps or other disruption of project.
2) No barriers to immigration/emigration.
3) Children from park campground often play in the water at this location. Possible interference with the project.

The second location was under the Highway 13 bridge in Pittsville, 44.45351N, 90.14969W. At this location, the same methods were used to catch crayfish, and 10 minutes yielded 49 rusty crayfish and zero natives.

Advantages to this location:

1) Ideal habitat.
2) Site was somewhat easy to access, only ~50ft from parking area.
3) Very little traffic on this area of river.
4) Very high abundance of rusty crayfish.

Disadvantages to this location:

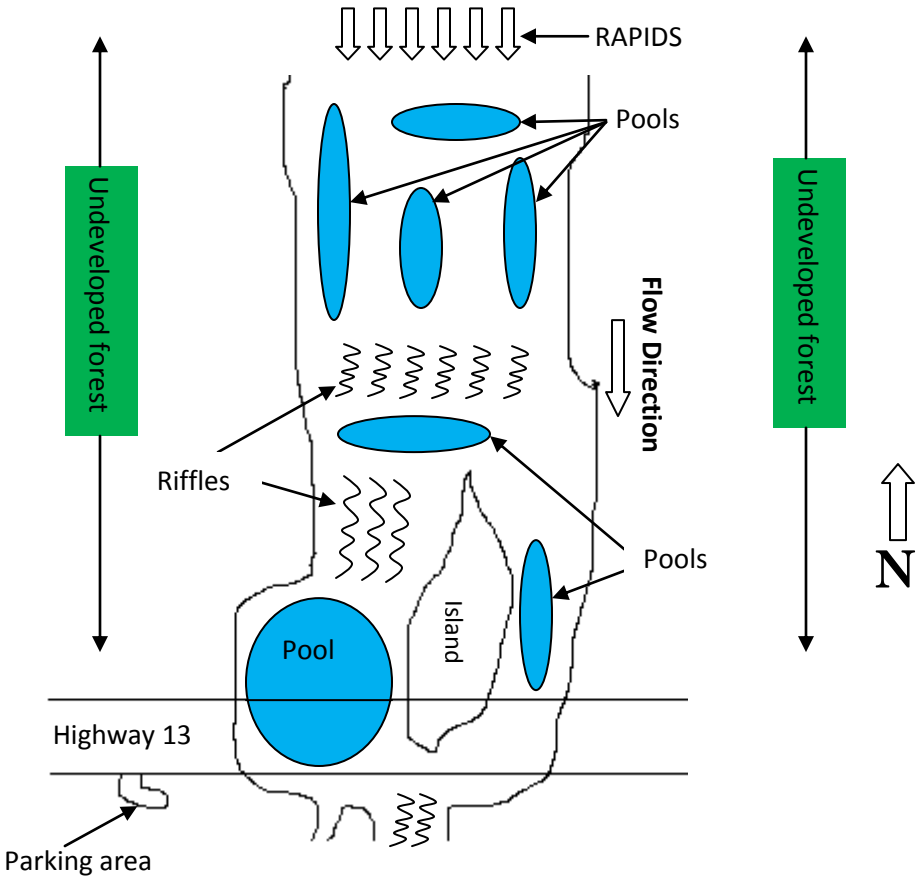
1) Deep pool under the bridge would be most likely to hold fish. If someone came down to fish in this location, they would likely concentrate on that pool. Traps should be placed with this in mind.

The third location we examined was below the Lake Dexter dam, 44.37756N, 90.11638W. The water level was high, and the current in this area was dangerously strong during this high water level. This site was disregarded as a potential site for the following reasons:

1) Current was very strong during high water. High risk of traps being washed downstream.
2) Water was too deep. Depth and current pose a hazard to staff and volunteers.
3) Site reported to be popular with fishermen. Possible risk of disruption/vandalism to project.

Site #2 (see Figure 1) under the Highway 13 bridge was chosen to be the project site. The advantages to this location clearly outweighed the disadvantages, and it seemed to be far better for the project than the other sites. Although the deep pool presented a possible disadvantage, we would place the traps only on the island side of the pool (see Figure 2). This way, the traps were not near the bank where fishermen would likely be standing. Our hope was that this would prevent possible vandalism or disruption of the project.

Figure 1. Map of Yellow River trapping location



Trap placement

The crayfish traps for this study were generously donated by Dr. Stan Szczytko of UW-Stevens Point. Traps were placed in areas that had visibly high abundance of crayfish, and had enough depth to keep water flowing over the traps. The traps were seven inches high, so traps were placed in no less than ten inches of water. A variety of substrate types and depths between 10 and 16 inches were covered.

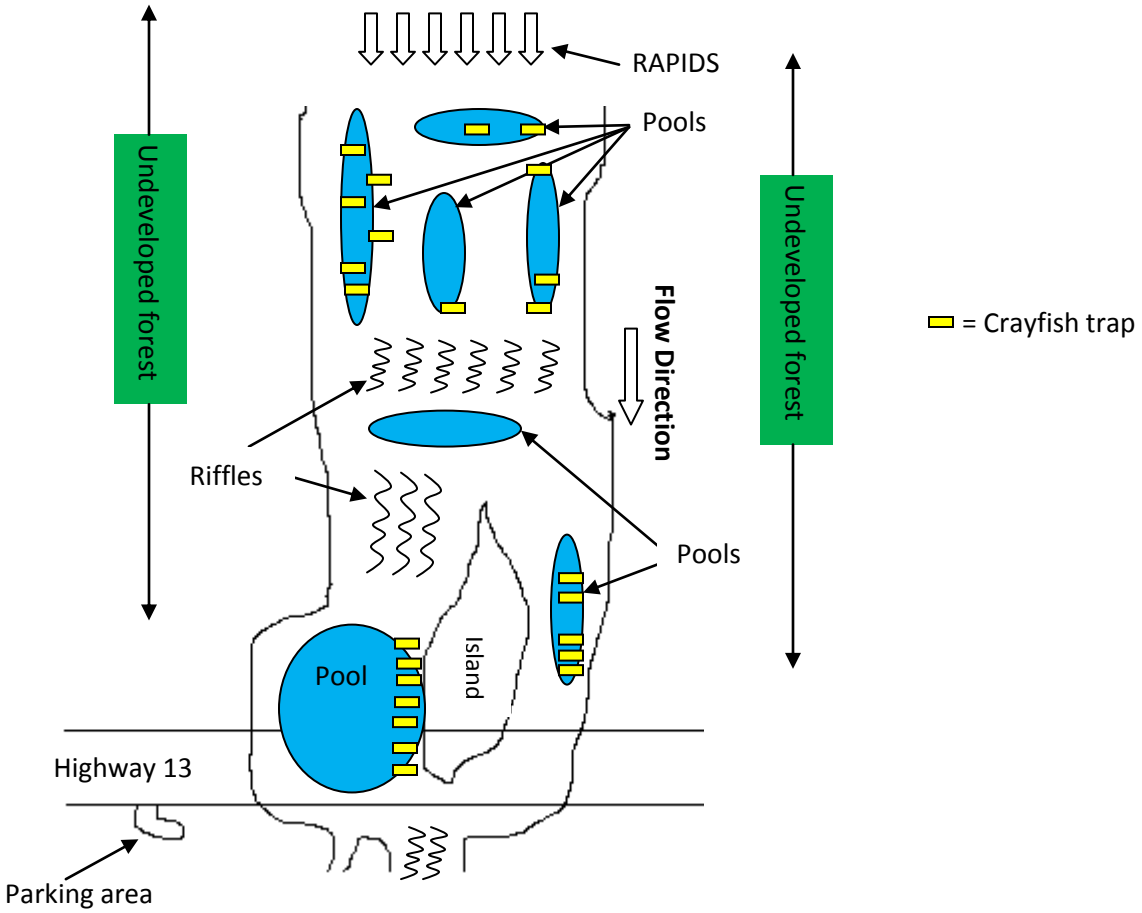
Table 1. Locations of crayfish traps

Trap #	Substrate	Depth (in.)	Latitude	Longitude
1	C	14	44.45376	90.15022
2	S	16	44.45376	90.15018
3	S	14	44.45371	90.15013
4	C	14	44.4537	90.15012
5	C	10	44.45369	90.15013
6	C	15	44.45358	90.15028
7	C	14	44.45356	90.15026
8	C	14	44.45352	90.15026
9	C	16	44.45355	90.15022
10	C	16	44.45354	90.15025
11	C	16	44.4536	90.15028
12	B	16	44.45362	90.15034
13	C	12	44.4541	90.15066
14	C	12	44.45415	90.15061
15	C	15	44.45422	90.15041
16	C	12	44.4542	90.15063
17	B	11	44.45426	90.15071
18	B	10	44.45431	90.15073
19	C	12	44.4544	90.15062
20	B	12	44.45445	90.15081
21	C	10	44.45443	90.15072
22	B	10	44.45461	90.15069
23	C	11	44.45477	90.15063
24	C	11	44.45438	90.15203

Legend

C=cobble, **S**=sand, **B**=boulders

Figure 2. Map of trap locations 6/29/2009



Bait

At the beginning of the project, we baited the traps with beef liver wrapped in cheesecloth. This was recommended to us by Dr. Szczytko at UWSP, because it was the same bait that he used during his 2007 trapping study on the Plover River. For the first two days, we used the beef liver with great results. Then we were able to secure free expired beef and other meat scraps from the meat counter at the Stevens Point County Market grocery store, so we baited the traps with that to save money. It worked equally well. On July 7th, we decided that it may be impractical to expect lake residents to wrap bloody meat in cheesecloth for bait every day. Since many lake residents (especially children) would likely be unwilling to do this (or may not have the budget to do this), we experimented with canned cat food. Two traps (#4 and #8) were rebaited with "Fancy Feast turkey & giblets with gravy". Cans of cat food were punctured with a knife in several locations in the lid and side of the can. A twist-tie was wrapped around the ring on the can lid and tied to the ceiling of the crayfish trap (Figures 3,4). This prevented the crayfish from reaching the can from outside the trap, or even once they were inside the trap. A big problem with the meat in cheesecloth was that once a crayfish got inside the trap, it would tear apart the cheesecloth and consume the bait (Fig. 5). The canned cat food did not allow the crayfish access to

the food itself—only to the smell of the food. Since the crayfish were unable to reach the food, we were able to reuse the cat food for multiple days. Use of cat food also greatly reduced the cleanup time, as the cheesecloth would often be torn to pieces or pulled through the trap holes by crayfish tugging from the outside.

The cat food was used exclusively during the last 4 days of trapping. According to the data, the average catch during this period was 27. By comparison, the average catch during the previous 4 days (baited with meat) was 25. Not only was the cat food easier, faster, cleaner, and safer than raw meat, it also caught more crayfish.

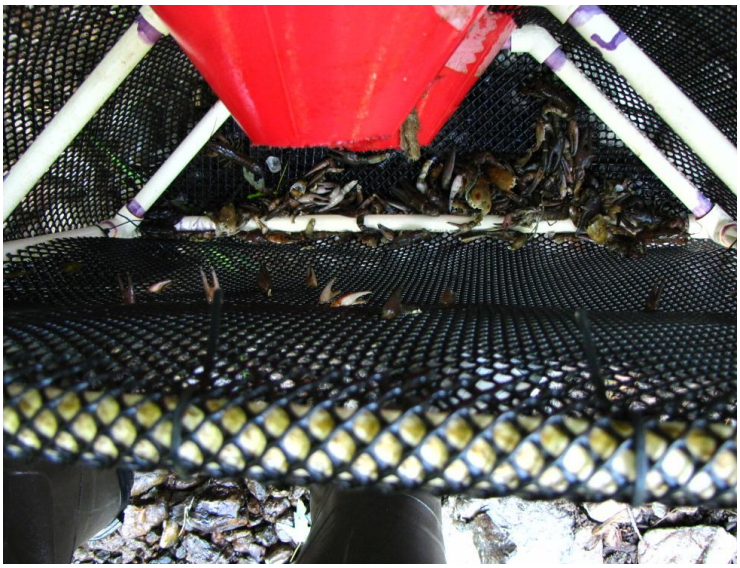
In traps where the bait was all eaten or was unavailable to the crayfish (canned cat food), we often had piles of crayfish pieces in the traps (see figure 6). Whether the crayfish were hungry or just intolerant of each other was unclear.

Figure 3. Canned cat food bait

Figure 4. Cat food hanging inside trap

Figure 5. Clean pork chop bone

Figure 6. Crayfish pieces in trap



Trapping results

A total of 14,762 rusty crayfish were removed from the Yellow River during this study. Not even a single native crayfish was observed. Single-trap catch rates varied between a maximum of 225 and a minimum of zero (see figures 7,8, table 2). Beginning with the 3rd trap check, the catch rates plummeted. During the second half of the study, average catch rates were usually less than one-fourth of the catch rate of the first trap check.

Crayfish were removed from the traps every other day, and were placed into 5-gallon buckets. These buckets were then hauled back to the vehicles, emptied into Ziploc bags, and the bags were frozen by Wood County LCD (see figures 9,10). A raccoon rehabilitation center in Nekoosa was contacted, and they were happy to take the crayfish to feed to their raccoons. They ended up with a surplus of crayfish, so some were shared with Bay Beach Wildlife Center in Green Bay.

Since inserting a hand into a trap with 200+ rusty crayfish is obviously a risky proposition, we used metal grilling tongs to remove them. We also used thick rubberized gloves (without tongs), which allowed us to remove several crayfish at a time without getting pinched. Only the very largest crayfish could pinch the glove hard enough that we could detect it.

Figure 7. **Total** crayfish caught per bi-daily trap check (7/1/09 – 7/31/09)

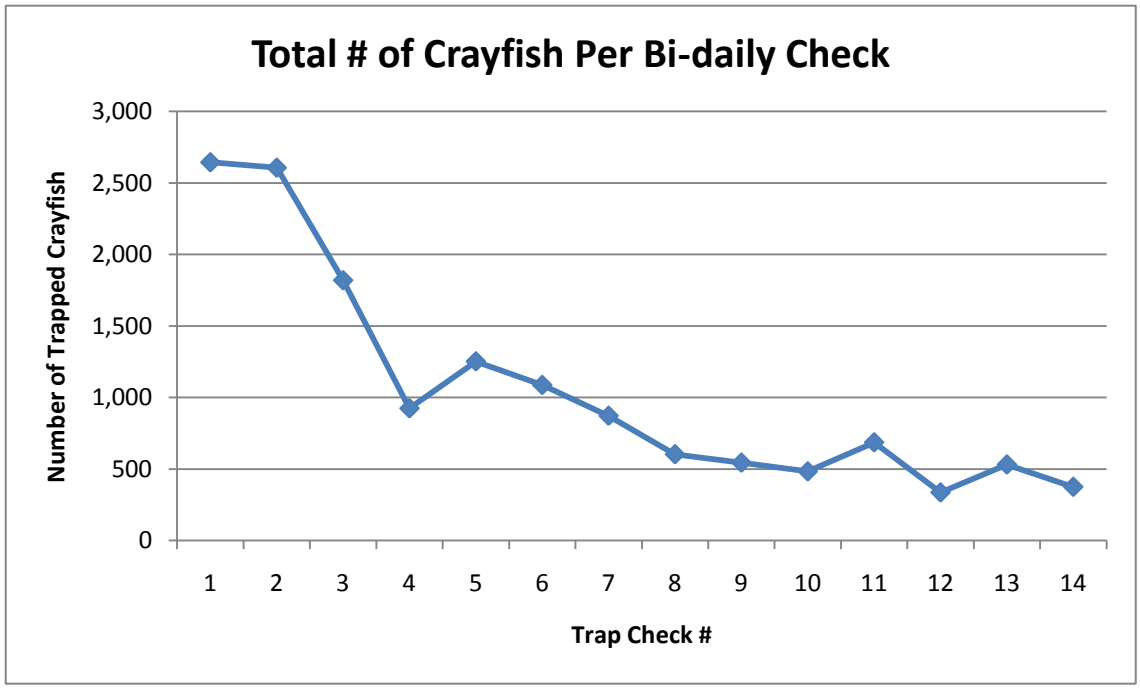


Figure 8. **Average** crayfish caught per bi-daily trap check (7/1/09 – 7/31/09)

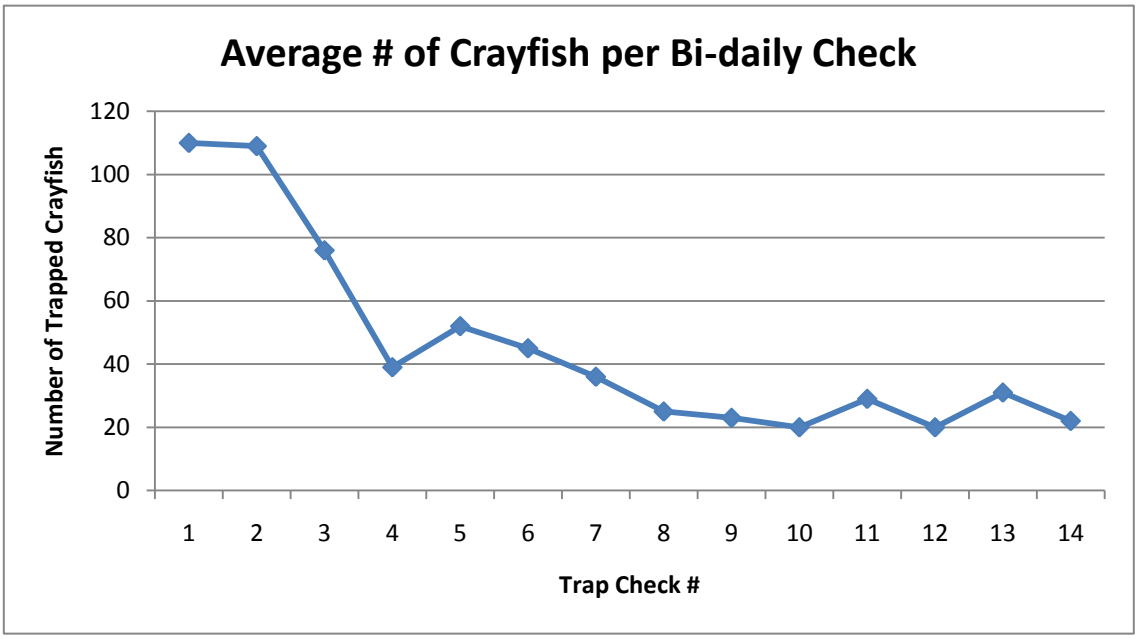


Figure 9. 1,809 crayfish on 7/7/09

Table 2. Trapping results

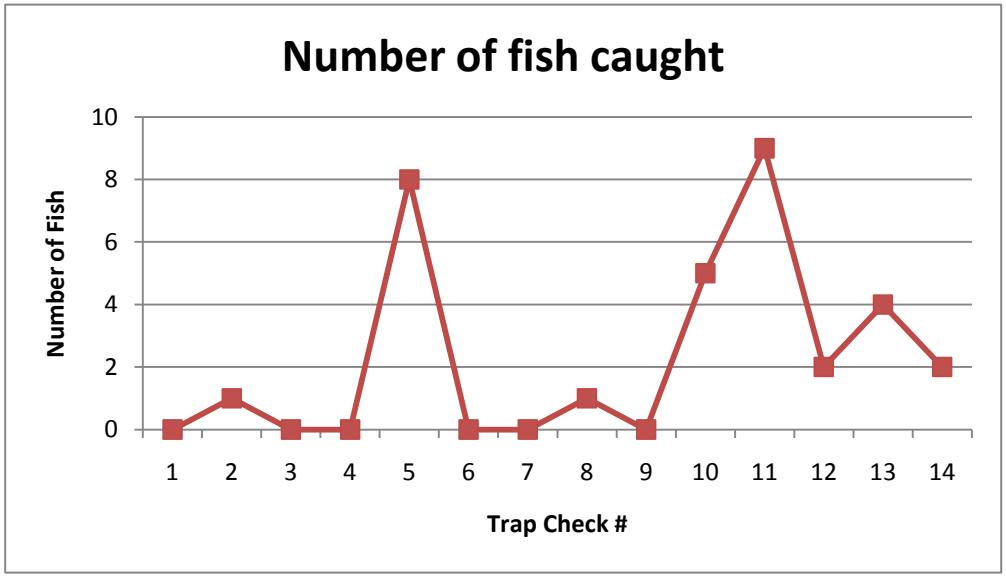
	Total crayfish	Average
Trap Check 1	2,644	110
Check 2	2,606	109
Check 3	1,819	76
Check 4	924	39
Check 5	1,252	52
Check 6	1,087	45
Check 7	872	36
Check 8	603	25
Check 9	544	23
Check 10	483	20
Check 11	686	29
Check 12	336	20
Check 13	531	31
Check 14	375	22
Cumulative	14,762	46

Figure 10. Bucket o' rusties

Bycatch

The crayfish traps used were designed to catch more crayfish and fewer other creatures. During the extent of our study, a total of 32 trapped fish were recorded (figure 11). The majority of these fish were stonecats (*Noturus flavus*) and creek chubs (*Semotilus atromaculatus*), with a few other minnow species comprising the remainder. This bycatch increased toward the end of the project, as did the number of visually observed fishes. By the end of July, schools of creek chubs and other minnows were frequently seen in pools throughout the study area. Stonecats could often be seen darting out from underneath rocks as we walked through the river. It was apparent that with the decrease of rusty crayfish came an increase in the native aquatic fauna.

Figure 11. Number of fish caught in traps



Stolen traps

Unfortunately, on July 27th, seven traps were missing from the stream. These were the seven traps placed under the Highway 13 bridge, in the deep pool. Wood County LCD and Golden Sands RC&D immediately contacted local law enforcement including WDNR and the Wood County Sheriff's Department, and filed a police report. Press releases were issued to local media, encouraging the public to watch for the traps and to contact Golden Sands, Wood County LCD, or the Wood County Sheriff's Dept. with any information. A project summary article was published in the Wood County Conservation Connection newsletter, and again included a paragraph about the missing traps. At this time, no information on the stolen traps has been received. Wood County LCD and Sheriff's Dept. staff have returned to the location several times to see if the traps had been returned to the area, but no traps have been found.

Summary and Recommendations

With the exception of the stolen traps, the 2009 rusty crayfish trapping study was very successful. A substantial decrease in the rusty crayfish population was visually observed, and also supported by the data. Comparing the first trapping day to the last day, the data show an 86% decrease in the rusty crayfish catch. We did not collect data on the local fish population, but a substantial increase in their populations was observed in the field. There seems to be a strong negative impact of rusty crayfish on the native fish community. A likely inference is that the crayfish were pushing the stonecats out of their habitat under large rocks, and were simply eating the minnow species. On more than one occasion, we released minnows that were caught in the trap, only to watch dozens of rusty crayfish in the river attempt to catch them, often successfully.

Type of substrate did not appear to have an effect on the catch rate. The vast majority of the Yellow River is cobble-sized or boulder-sized rocks, so the amount of undesirable habitat is minimal. Areas of sand were present, but were generally small and of close proximity to cobble or boulders. In this section of the Yellow River, rusty crayfish are never far from shelter.

Citizen groups could easily replicate this project. Projects should use the trapezoidal trap design like those we used; they are very effective at catching crayfish, and tend to not catch large numbers of fish. Various baits were effective, but the canned cat food was the best in terms of catch rates and safety. Trapping for sheer numbers of adults is probably best in midsummer, but to maximize the reduction in rusty crayfish population, it is recommended to trap in late spring, before the young crayfish have hatched. Female crayfish carry their eggs around until they hatch, so removal of these females with the eggs would be more beneficial to the population reduction effort.

Appendix A – Additional photos from project

Figure 12. Abundant crayfish at Hwy 13 trapping site (before trapping)

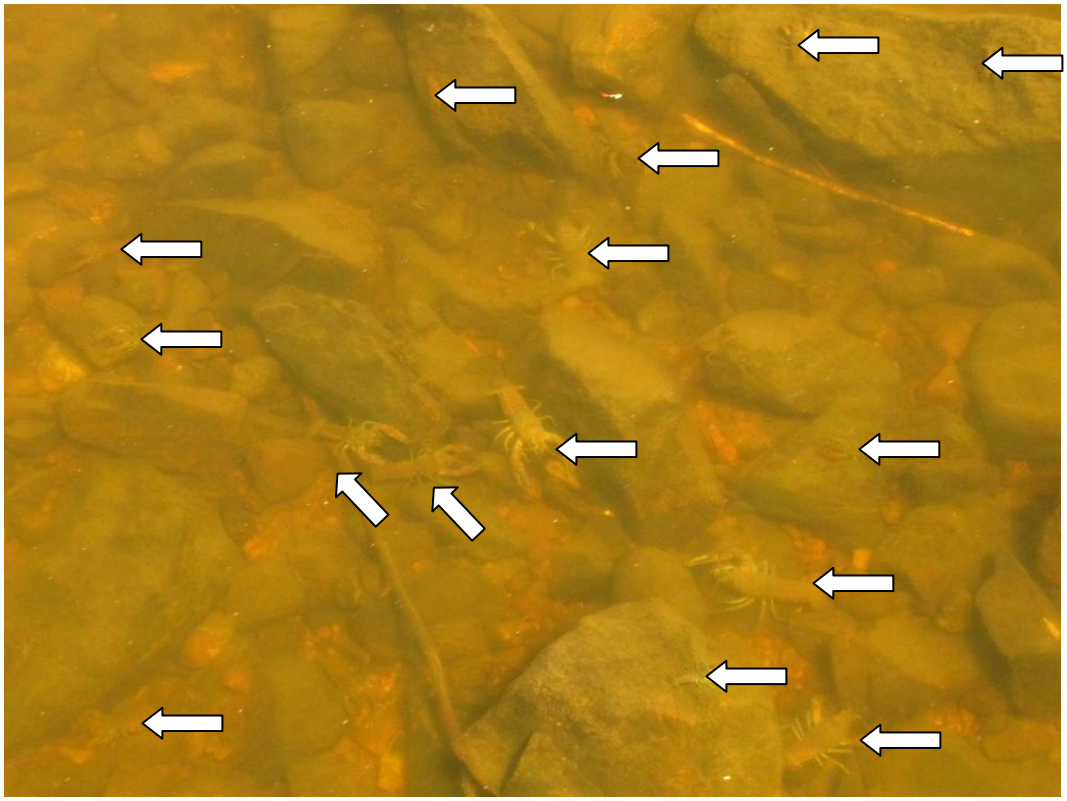
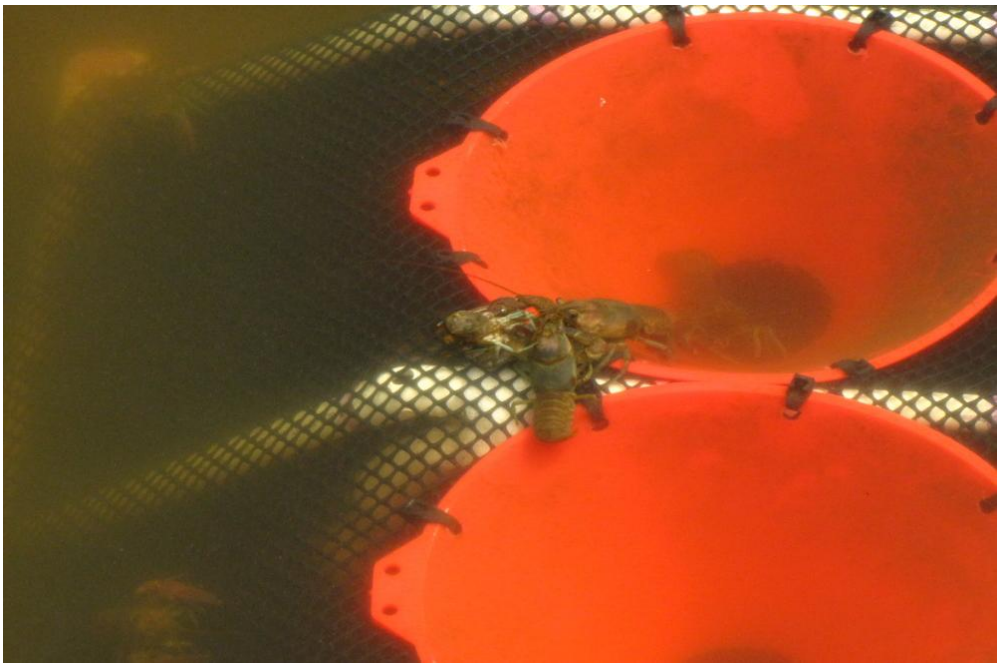


Figure 13. Rusty crayfish fighting over a piece of cheesecloth pulled through the trap



Appendix A (cont.)

Figure 14. Upstream half of trapping site

Figure 15. Traps 1-3, set on east side of island

Appendix A (cont.)

Figure 16. Rusty crayfish inside cheesecloth

Figure 17. Trap full of rusty crayfish