



The Newsletter of Plum Lake Association

June 26, 2014

ORCONECTES RUSTICUS

This is the story of rusty crayfish and Plum Lake. It is a brief summary of where we were, where we now are and how we got here. Spoiler alert...it doesn't have a happy ending. Indeed, the ending hasn't been written yet. We are writing it now. WE will determine how it ends.

1. THE BEGINNING

The lady in the photo above was enjoying her weekly workout – moving uprooted lake weeds that had been part of Plum's weed beds. Prior to being forked up out of the lake, they had floated in with the prevailing winds. Upon reaching shore, they begin to decay. Left alone, they would become a black, stinking, oily floating mess of rotting goop. This was the weekly byproduct of feeding rusty crayfish. It was also my weekly workout. I lived next door.

2. TAKING ACTION

In 1998, Plum Lake Association hired a consultant (at significant expense) to study the state of the lake and the state of the crayfish infestation. It documented the decline in Plums weed beds and with divers, the extent of the rusty crayfish infestation. They found them at all depths in the lake – everywhere. This was something new in their experience. We had noticed a decline in hard stem bulrush and arrowhead (emergents) as well as the submergent weed beds in many parts of the main lake and Starlight Bay. Most notably, panfish populations were in severe decline. In the shallows, crayfish were biting toes. At night, the lakebed shallows were crawling with crayfish.

The association and the town government began to take action and after the study, hired trappers to remove crayfish and soon dozens of white bottles marking the traps were spread across the lake. Lake residents also set traps. After years of effort, it didn't make a dent in the population.

The township enlisted volunteers to study the crayfish. Traps were bought and a yearly trapping event was held, with crayfish caught being counted, sexed, measured and examined. This event went on for years with data provided to the University of Notre Dame for use in a study they had commenced. This work was conducted on both Plum and Star.

On the following page I will detail the work of the Wisconsin DNR on the rusty crayfish problem on Plum and Star.



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Well, that wasn't very subtle, was it . It was also probably more than a little politically incorrect. Nevertheless, I couldn't find anything the state has done on the rusty crayfish infestation on Plum and Star, so it is also quite true. And this is where we are today. The only work has been done and paid for by us. We have had no help from the state. But there is news, courtesy of Notre Dame and their recently published addition to their research study. I will detail some of the findings in part three.

3. TOOLS AND A POTENTIAL SOLUTION

In the Notre Dame research report, “*A Trematode parasite alters growth, feeding behavior and demographic success of invasive rusty crayfish (Orconectes rusticus)*”, Plum Lake played a leading role. It was the site of a two year experiment because it had one of the “highest infection prevalence (population densities) of rusty crayfish and a greater range of infection intensities”. Let me summarize the current situation on Plum.

The scientists discovered that a snail that inhabits the weedbeds in Plum and other northern lakes is host to a parasite (*Microphallus*). This snail is eaten by rusty crayfish and the parasite infects its digestive tract, causing the crayfish to eat less. These infected crayfish do not grow as large and do not produce as many eggs, slowing reproduction. Most importantly, reduced size in these crayfish make them more vulnerable to their only real predator, bass.

The easiest way to go from here is to give you some of the data and conclusions from the study and allow you to draw your own conclusion on how we should proceed. I am confident you will arrive at the same place that I have. Here are some quotations from this study:

1. “Smallmouth bass are voracious predators of *O. rusticus*.”
2. “There was significant effect of fish treatment on crayfish feeding behavior, indicating that crayfish were less likely to feed when a smallmouth bass was present.”
3. “The effect of fish was similar in magnitude to that of infection (parasite); crayfish were roughly 19% less likely to feed when infected and 23% less likely to feed when fish were present.
4. “Reductions in growth are likely to occur over multiple years and smaller crayfish also experience higher mortality due to predation.”
5. “Sites with high parasite prevalence were associated with reduced crayfish population growth in the subsequent year, and crayfish populations declined in sites with the highest parasite prevalence.” [combined with higher predation by bass on these small crayfish, this could begin to look like a real solution]
6. “Negative impacts of *O. rusticus* on Macrophytes (lake weeds) macroinvertebrates, and fish are observed in locations where *O. rusticus* trap catch exceed nine crayfish per trap and many impacts scale with *O. rusticus* abundance.” [the traps in our annual surveys usually contained north of 20 crayfish, with some at 30 or higher]

There are many studies on the effects of crayfish in northern lakes. One examined how rusties ate the eggs off bluegill and sunfish nests (Horns and Magnuson 1981). This may partly explain why we have so few panfish nests. Another looked at bass nests—big predation problem there too. Minnesota Sea Grant produced an extensive review of all of the negative aspects of a rusty

crayfish invasion. Northern Pike and bluegill were shown to decline by a Wisconsin study by Harlan Carlson in 1994. In Canada, studies showed that largemouth bass on Pounsford lake and smallmouth on Lake Lenore declined after rusties showed up. Most studies also referred to a decline in mayflies, dragonflies, stoneflies and midges due to rusty predation. In short, the impact on the entire ecosystem is significant on lakes with severe infestations. Plum is at the top of the severe category.

On the other side of the coin is how our DNR deals with the bass populations. This is the last piece of this puzzle and the trend is not in favor of bass. As we know, the DNR and Tourism decided to open largemouth bass season early to allow spawning fish to be taken. On Plum, as we feared, this has resulted in large smallmouth bass being taken out of season and before spawning. I witnessed it twice in early May in just a couple of hours of fishing with friends. There were a large number of boats on the lake fishing bass in May, thanks to newspaper articles trumpeting the early opening of "bass season". A trophy bass was taken in May in front of the golf course, proudly weighed at 7 1/2 pounds, shown off to golf course personnel (who also thought bass season was open) and put in the live well in the boat. I am certain they were not the only large smallmouth to be taken out of season. It was also happening on Star.

DNR is very focused on walleyes, however and there is a concern that bass are competing with walleyes on some lakes. Walleyes are the money fish in Wisconsin and DNR wants to be seen as aggressive defenders of walleye populations. But their own recent reports show the importance of protecting bass during the spawning season. Here are a couple of additional quotes from our WDNR Black Bass Management Plan for your consideration.

1. "Closed fishing seasons are common management strategies for many states in the northern tier.....they generally use closed seasons to afford protection to spawning bass."
2. "It was apparent, based on observations by Law Enforcement personnel, that many anglers have difficulty distinguishing between largemouth and smallmouth bass."

4. CONCLUSION

Here is where I settle out on all of this. We now have the knowledge that we can impact the rusty crayfish infestation by protecting bass on Plum and Star. According to the most recent census of bass, we have 490 smallmouth bass - just one fish for every **2 acres** of water on Plum and even fewer largemouth (a population that was too small to measure in 2012). By any measure, it is a small population of fish. There are nearly 8 times as many walleyes in Plum. **Considering the role bass play with our invasive species, I can see absolutely no legitimate reasons to take even one bass out of the lake.** Indeed, if we protect these bass and allow the population to increase a bit, it will clearly help reduce the population of crayfish. This will have a ripple effect throughout the lake, increasing submergent and emergent weed beds, which will improve panfish populations, provide more habitat for the snails which will further stress rusty crayfish and perhaps ultimately bring some balance back to our lake and return it to the balanced fishery it once was.

We should begin with a petition to the state (Administration, DNR, Natural Resources Board) to establish Plum and Star as Biomanipulation Lakes, immediately change the harvest rule on all bass to "catch and release" and provide regular policing by DNR wardens to insure these regulations are observed. Protecting the bass we have in the lakes now is a start but this will be resisted by DNR, who seems much more focused on walleyes than working to reduce Plum and Star invasive species. At the same time, we should consider a future effort to grow the bass population while maintaining

a large average size. The associations and the township could help fund a stocking effort from bass spawn taken from each lake, hatchery raised and restocked at a survivable size. For Plum and Star, walleyes are nice but bass are critical. Walleyes, by the way, are also negatively impacted by rusty crayfish.

This story began and will end with lake weeds. On Plum and Star, they remain greatly reduced from their natural state before rusty crayfish exploded in our lakes. We have the knowledge and the tool to reverse the trend. We need to use them now.

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SHORT CASTS

1. Our loons were driven off the nests by gnats and flies this spring. All three pair left 2 eggs on each nest. Loon watch reports that 80% of the loon nests in northern Wisconsin were abandoned due to fly swarms around the loons. The Starlight bay pair are back on their nest as of last week. The other nests are still abandoned. As they say on TV.....But Wait!!! I heard loons calling from the NE part of the east bay (Star Bay on the old maps) most of the last week. So today, I checked it out. We have a nesting pair on the nest platform that went unclaimed earlier in the year. They are VERY shy. 100 yards of proximity gets them into their crippled loon dance, so stay away. Another good reason to keep a distance is the rock bars surrounding the platform.
2. In December, when the presence of spiny water flea in Star Lake was announced, we asked the DNR to construct a bilge and baitwell drain area off the boat landing on Star Lake to help prevent the spread to other lakes. They confirmed last week that construction will start in July.
3. Beware!! Straight line winds are becoming a regular occurrence on Plum. Boat lifts have been tossed every year by these rapidly developing bursts of wind. After two successive years of getting mine flipped, I found an auger type anchor in Minnesota which is used by virtually every cottage owner on Mille Lacs and many other lakes. If your boat is off the lift when this wind comes up it's good insurance. I know of one wind on Lost Canoe last year that flipped both the lift and a 19foot glass boat that was on it.. Plum had another micro burst go through on the 26th—my lift is fine. Giant birch tree that dropped and missed the house will become firewood.

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May 11, 2014

Ivory, Chris Wise and a new platform in the East Bay of Plum



June 29, 2014