Spawning Behavior in the Western Basin

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In this month's edition of *The Hook*, I am going to talk differences in the spawning behavior of male and female walleye tagged in the western basin of Lake Erie and discuss why this matters for fishery management in Ohio's waters of Lake Erie.

Starting in 2013, the Division of Wildlife and US Geological Survey have collaboratively caught and tagged hundreds of spawning walleye within Ohio's reef complex. In the years after tagging, acoustic receivers were deployed on four of the largest reefs within the complex: Crib, Locust, Niagara, and Toussaint (Figure 1). These receivers were deployed in a way that allowed us to "triangulate" the position of a tagged walleye within 10-15' of their true location in the lake (read more about this here: https://glatos.glos.us/Acoustic).

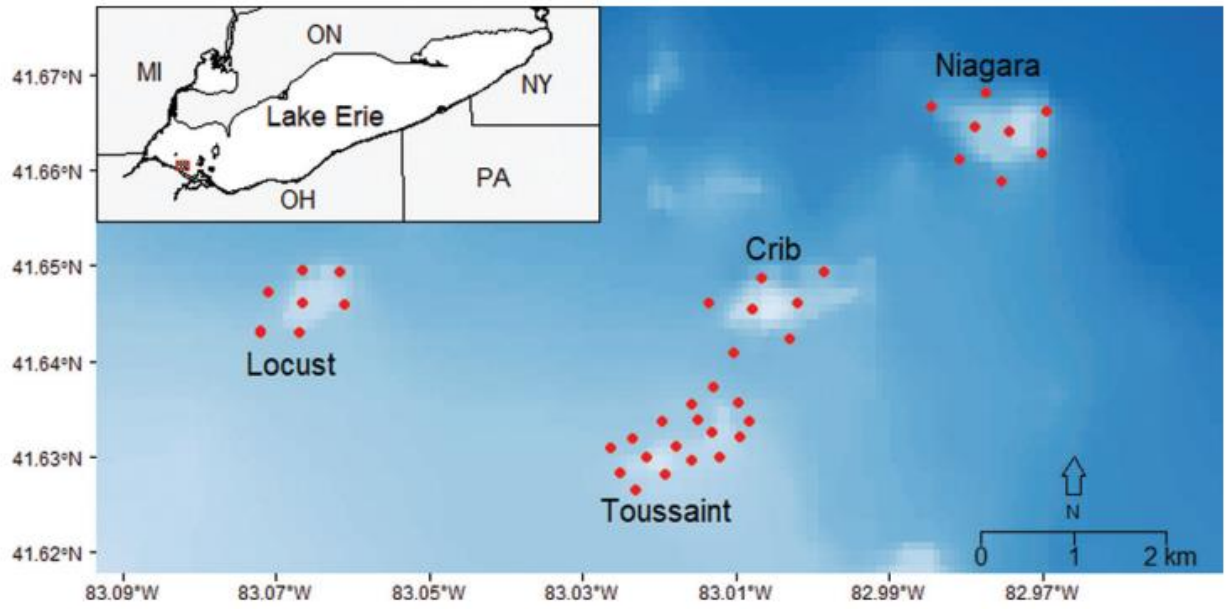

Figure 1. Map showing locations of acoustic receivers deployed on Crib, Locust, Niagara, and Toussaint reefs during 2014-2017. Red dots = acoustic receiver.

These fine-scale detection data were used to examine how much time males and females spent on these reefs during the spawning periods in 2014-2017, and importantly, relate any differences back to observed harvest from the open-lake jigging and trolling fisheries that overlap with the spawn each year. We thought that males would spend more time around the reefs than the females and that this time difference would translate into more males being harvested by anglers jigging compared to those trolling areas around the reefs.

Not surprisingly, males spent a lot more time on the reefs than females (Figure 2). We used data from Ohio's creel survey to compare numbers of males and females harvested by anglers jigging the reefs versus trolling in 2010 and 2017, which supported our working hypothesis. Both of these results were similar to the river fisheries we see during the walleye runs in the Maumee and Sandusky: overwhelmingly male-dominated angler harvest driven by differences in male and female spawning behavior. Males show up early and stay much longer than females to avoid missed spawning opportunities. In contrast, female walleye may release all of their eggs in a single night and leave much earlier than their male counterparts.

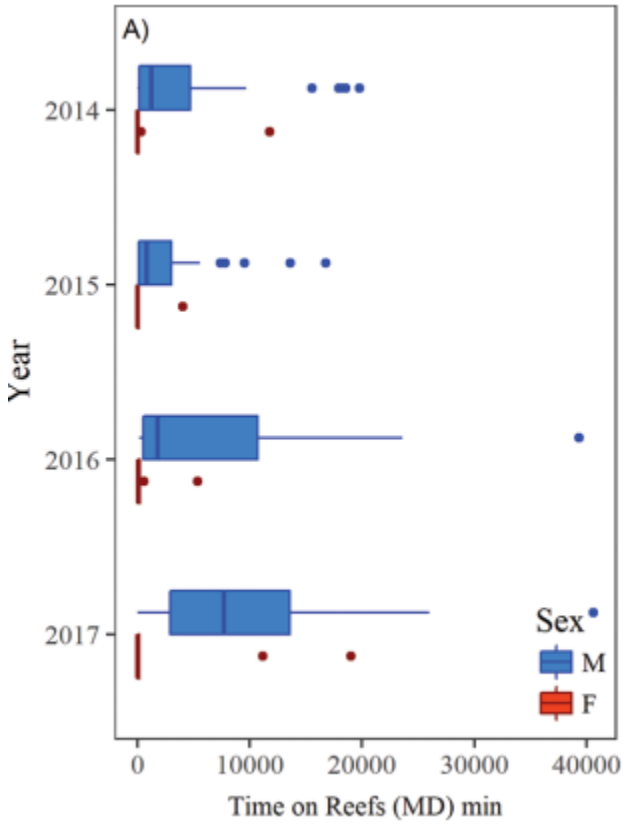

Table 4. Counts of male and female walleye harvested on or near Lake Erie's Ohio reef complex by jigging and trolling anglers during 2010 and 2017.

Method	Year	Males harvested	Females harvested	*p*
Jigging	2010	489	1	0.010
	2017	160	2	0.028
Trolling	2017	67	59	0.796

Figure 2. Time spent on reefs for male (blue) and female (red) walleye during 2014-2017. Adjacent table shows number of male and female walleye harvested by angling type in 2010 and 2017.

So, why does this matter to fishery management? Targeting spawning aggregations of fish can sometimes be a bad thing for a fishery's sustainability. In the case of Ohio's waters of Lake Erie where harvest during the spawning period is allowed, our fisheries are relatively small (meaning harvest during the spawning period is low relative to non-spawning periods). The figure below shows Ohio's walleye harvest during the spawning period (main lake and rivers) and total harvest since 2012. Harvest during the spawning period has averaged ~ 8% of Ohio's total sport harvest for the year and when compared to annual population estimates, Ohio's harvest during the spawn has averaged 0.002% of the lake-wide population. Further, the harvest that does occur in the spring tends to be male-biased thanks to sex-specific differences in spawning behavior. Collectively, this leads us to believe that allowing spring harvest does not negatively impact Lake Erie's walleye population.