

Meadow Lake Snakehead Monitoring

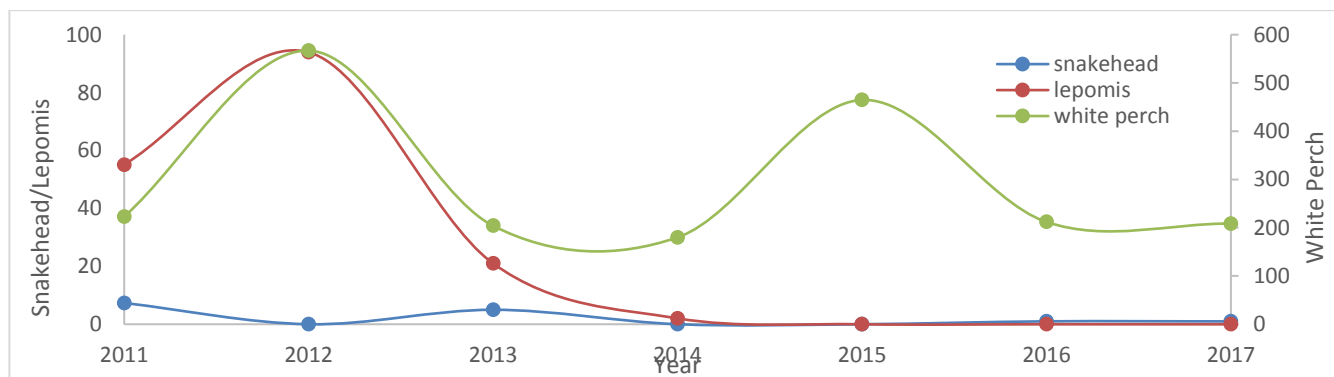
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Meadow Lake (94.9a) is the larger of two fresh water bodies located entirely within Flushing Meadows Corona Park in Queens County, NY. The two ponds are connected by a narrow creek, while Meadow Lake, the more downstream of the two, is connected to Flushing Bay through Flushing Creek. The connection is interrupted by a tide gate which is intermittently opened by managers at the NYC Parks Department. As a result, Meadow Lake has slightly elevated salinity that typically hovers in the range of 4-7ppt and hosts a mix of estuarine and freshwater fish species. Northern snakeheads were first found in the lake in 2005, and annual NYSDEC general biological boat electrofishing surveys have documented them at low levels of abundance since then. Boat electrofishing was conducted again in 2017 to continue monitoring the northern snakehead population and assess any impacts this introduced predator may have on the native fish community.

In 2017, one 18.7in adult northern snakehead was collected in Meadow Lake, out of 285 fish from 5 species (plus eels and carp that were observed but not collected). When compared to previous years, the northern snakehead population in Meadow Lake does not demonstrate a consistent trend either positive or negative (Figure 1). Only fall electrofishing surveys are compared across years since spring surveys were not conducted regularly and demonstrated dramatically reduced catch-rates.

Figure 1: Fall CPUE (number caught/h) for important fishes in Meadow Lake from 2011-2017. Since spring surveys have very different results only autumn surveys are included.



Consistent with past years, white perch were the most abundant fish collected (Table 1). 2017 also marked the third year in a row that not a single *Lepomis* spp. was captured in Meadow Lake. The beginning of the decline coincided with a large multi-species mortality event (cause unknown) that occurred during late summer/early fall in 2014. Also in 2014, the control board of Region 2's electrofishing boat was replaced. The new board limits the amount of voltage available for fishing. This limitation presents a disadvantage in high conductivity environments such as Meadow Lake and may also help explain why no further *Lepomis* have been captured. As of now there is no definitive explanation for the disappearance of sunfish from Meadow Lake surveys. Additional boat electrofishing as well as seine and trap net surveys will be conducted in 2018 to try and ascertain whether sunfish are truly absent or just difficult to catch.

Overall, there is no evidence that the snakehead population in Meadow Lake is increasing. There are also no evident impacts of snakeheads on native fish but the fish community of this system as revealed through electrofishing is not always consistent. Boat electrofishing surveys will continue annually to monitor the status of the snakehead population and its impacts.

Table 1: Percentage of individual fish by species in Meadow Lake from 2011 to 2017. Carp, eels, and snakeheads which were observed but not captured have been excluded.

Species	Survey Year						
	2011	2012	2013	2014	2015	2016	2017
silverside	9.4	51.8	3.2	33.5	19.8	1.2	1.1
gizzard shad	3.4	1.5	2.8	20.7	1.5	4.3	20.0
brown bullhead	0.0	0.1	0.0	0.5	0.0	1.2	0.4
mummichog	0.0	0.5	0.3	0.3	1.7	5.5	0.0
white perch	68.2	39.5	81.9	44.6	72.5	83.5	74.4
pumpkinseed*	16.5	6.5	8.4	0.5	0.0	0.0	0.0
largemouth bass	0.4	0.0	0.0	0.0	0.0	0.0	0.0
snakehead	2.2	0.0	2.0	0.0	0.0	0.4	0.4
goldfish	0.0	0.0	0.0	0.0	3.5	0.8	2.8
other	0.0	0.0	0.0	0.0	0.2	3.1	0.0

*1 bluegill, from 2012.