HUDSON RIVER PK

Fish Survey Report 2020

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Purpose

Hudson River Park conducts an annual fish survey to monitor local fish population dynamics and connect our community to the River. This fish survey informs our understanding of fish diversity and abundance in the Park. By tracking fish diversity over time, we can see broad changes within population dynamics and within specific species — for example, the average size of fishes — and infer how seasonal changes and major events, like storms, affect local fishes.

COVID-19

Due to the COVID-19 pandemic, the Park's fish survey was both shortened and downsized in 2020, running from July-December with 8 traps (down from 24) and without any public fishing programs. This year's survey therefore consisted solely of trap-based collection (moved to Pier 40 from Pier 25), which was streamed bimonthly in order to maintain some level of public engagement while adhering to state safety protocols.

Key Questions

- How do fish populations vary between years and species?
- How does Pier 40 compare to Pier 25 in terms of species and abundance?

Fig. 1 (above) | Pier 40 gangway and floating dock, where survey traps were moved during 2020 pandemic.

Fig. 2 (below) | Atlantic menhaden (*Brevoortia tyrannus*) being measured during trap checking.

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Methods

- HRP's 2020 surveillance of collection gear took place 1-3 times per week, every week, starting in July, when it was deemed safe for staff to partially return to work.
- Every other week, this monitoring was streamed to the Park's Instagram (IGTV) live in order to connect to the public and answer questions in real time.
- Fish caught in the traps were identified, measured to the nearest ½ centimeter, and additionally reported to the DEC.
- Data were analyzed with Excel.

Major Findings

In order to compare 2019 and the irregular 2020 season (with a quarter of the traps and ½ the duration), we plotted relative abundance of each fish species caught within the two years (Fig. 3). There were 17 species found in 2019, and 14 in 2020, three of which were not caught in 2019: the Atlantic menhaden (Fig. 2), summer flounder (Fig. 7) and – caught for the first time ever in 30 years of trap surveys – the striped burrfish (Fig. 6)! Similar abundance in the most common species (Black sea bass, oyster toadfish, and tautogs) were observed, as well as a higher number of syngnathids (seahorses & kin) in 2020.

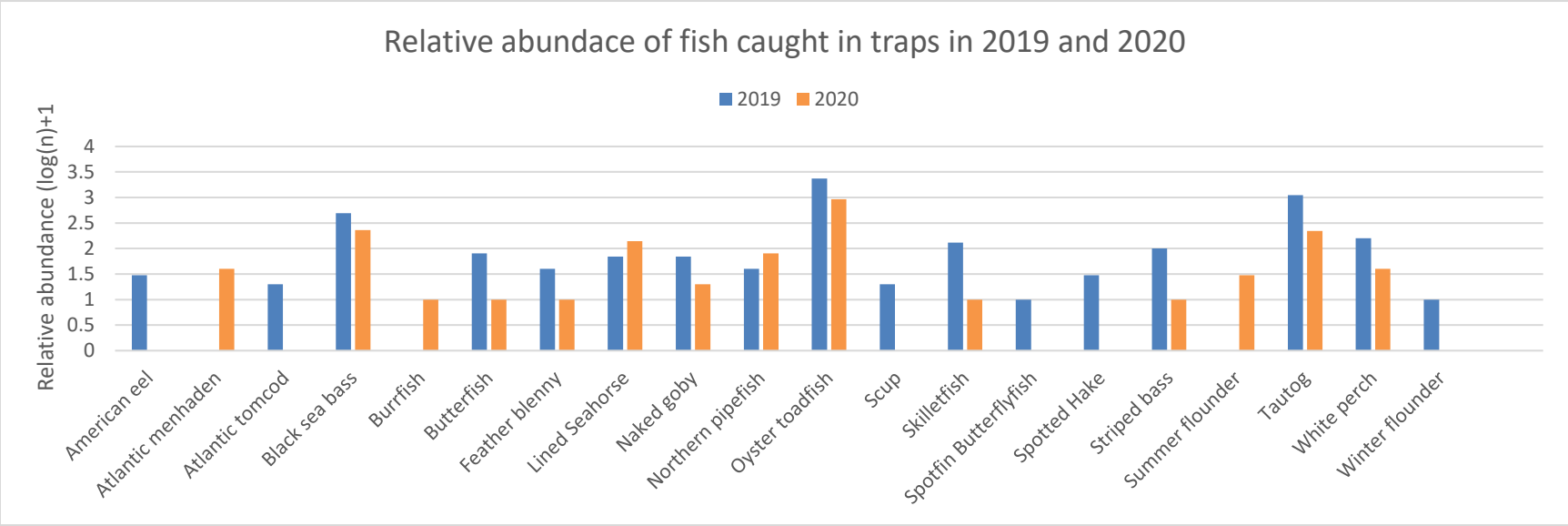


Fig. 3 | Relative abundance of fish caught via trapping in 2019 and 2020. 2019 saw 24 traps over 12 months; 2020, 8 traps over 6 months. Values were subjected to logarithmic translation to aid in visualization by reducing spread of outliers.

Though microhabitats within the Estuarine Sanctuary are common, a relatively similar diversity profile can be seen at Pier 40 (2020) compared to Pier 25 (2019) (Figs. 4 & 5), with many of the gaps in species able to be attributed to the curtailed season and reduction of traps. Atlantic tomcod, winter flounder, and spotted hake are all cold-water fish, more active in the colder months that were precluded from 2020 due to quarantine measures.

Only one menhaden has ever been caught in TRP survey gear, in 2016. This year, however, the huge numbers of menhaden in the river meant that several individuals found their way into the traps, even though these pelagic fish do not seek out substrate to hide in.

Skilletfish (Fig. 8), while only seen once survey traps, were regularly observed in oyster cages within meters of said collection gear; which comes as no surprise as oyster shells are their preferred hiding spots.

The most fishes were caught in August and September, with significantly more fish caught relatively in October of 2020. Toadfish and tautogs comprised a large portion of fishes caught, as expected, while slightly more seahorses and pipefish were collected in 2020 as compared to 2019. This is likely within normal population variance, but future years will clarify discrepancies between Piers 25 and 40.

Fig. 4 (below) | Abundance of 7 species commonly caught in 2019 between June and October via trapping.

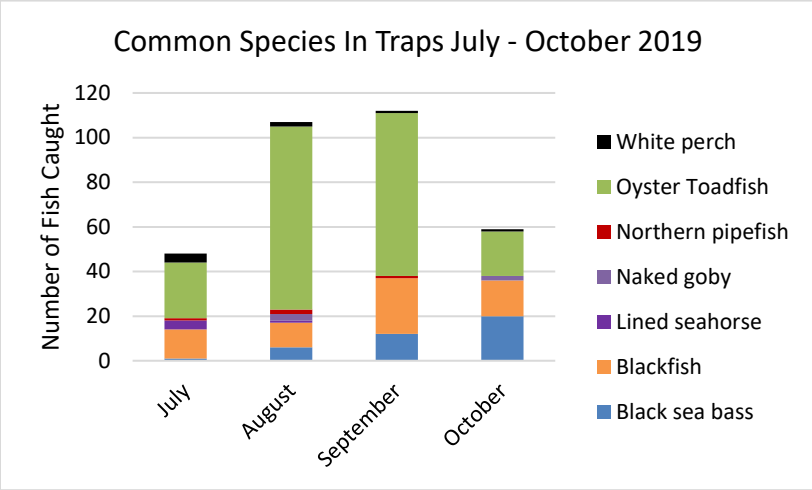
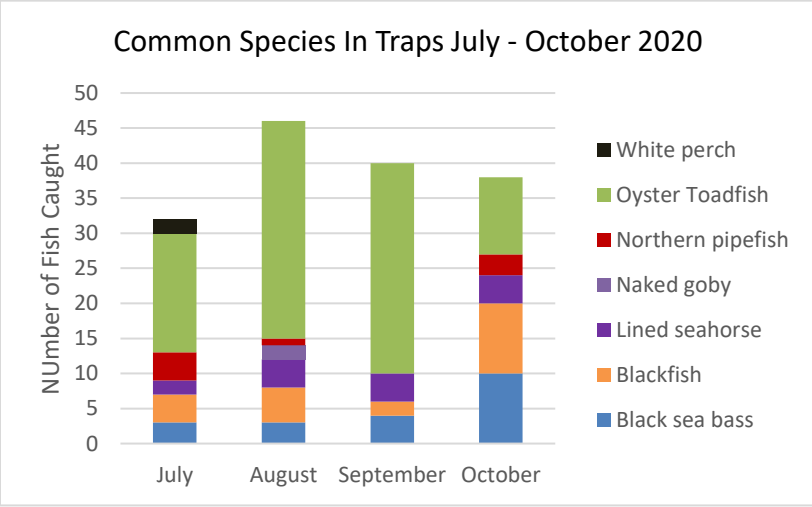


Fig. 5 (below) | Abundance of 7 species commonly caught in 2020 between June and October via trapping.



Take Aways

From year to year, the River Project consistently catches Oyster toadfish, tautogs, black sea bass, lLined seahorses, Northern pipefish, fFlounder, and white Perch.
It is likely that the most fish were caught in August/September because the water was warmest during this month. Lower species diversity in 2020 was likely due to curtailed season and reduced number of traps compared to 2019. Despite this, 2020 still saw relatively abundant populations of the various species expected at this section of the Sanctuary. Though long term fish abundance has decreased in the estuary (Stinette et al., 2018), and globally (WWF, 2020), we are seeing some species – such as toadfish and tautogs – that are increasing, with a relatively consistent spread of different species each year.

Fig. 6 (above) | The first striped burrfish (*Chilomycterus schoepfi*) ever caught in Hudson River Park

Fig. 7 (above) | Summer flounder (*Paralichthys dentatus*).
Fig. 8 (below) | Skilletfish (*Gobiesox strumosus*).

Future Directions

Moving forward, the River Project will continue to collect data about the fishes in the Park as the trap survey continues. The River Project also plans to expand its survey methods. Park staff have begun sampling for environmental DNA (eDNA), a method by which researchers can survey the presence of fishes by sequencing DNA from water samples. This can show fish species not commonly seen through fishing/trapping. Additionally, The River Project will restore the trap study to 24 traps split between Piers 25 and 40 for the foreseeable future in order to gather data spread across the lower Manhattan area. Future years will therefore be able to assess differences in microhabitat and more broadly assess fish populations within the Lower Hudson Estuary.

Fig. 9 (above) | One of the many Lined/Northern seahorses (*Hippocampus erectus*) caught in the traps this year.

References

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