

Delaware Estuary

Bucks, Delaware, and Philadelphia Counties

2022 Striped Bass Survey



Area 6 Fisheries Biologist Tyler Grabowski and Area 6 Fisheries Manager Mike Porta holding two of the larger adult Striped Bass collected in 2022.

The Pennsylvania Fish and Boat Commission (PFBC) assessed the Striped Bass spawning stock in the Delaware Estuary between May 2 and May 23, 2022. Annually, PFBC staff conducts adult Striped Bass sampling at 21 index sites between the mouth of Rancocas Creek, NJ (river mile 109) downriver to the mouth of Raccoon Creek, NJ (river mile 80). However, access was limited at two sites in 2022, therefore sampling was conducted at 19 sites. Established protocols were followed at the 19 sites and each site was sampled twice using boat electrofishing (38 total samples). Additional collection efforts (beyond the 19 historical sites) were conducted at Trenton Falls near the head-of-tide to capture larger Striped Bass (≥ 16

Pennsylvania Fish & Boat Commission Biologist Report

in) for tagging purposes. Several sites between Bristol and Croydon, PA were investigated to determine if spawning activity is occurring further upriver than the current established sampling locations. These sites will be revisited in 2023 to determine if these sites are suitable for inclusion as index sites to replace those sites that have been or will be lost in the future.

A total of 167 fish were captured at the 38 index sites in 2022. Males accounted for 61% of the total catch and ranged from 7 to 31 in, while females accounted for 20% of the total catch and ranged from 17 to 45 in. The remaining 19% of the total catch was comprised of fish of unknown sex. Sex could not be determined for these fish because they were small, sexually immature juveniles or larger fish that were not “running ripe” (actively flowing eggs or milt) or green (female in pre-spawn condition) at the time of capture. Those fish ranged from 5 to 40 in. The total catch rate (9.95 fish/hr), catch ≥ 12 inches (8.64 fish/hr), and catch ≥ 28 inches (1.67 fish/hr) of Striped Bass during the 2022 survey were all lower than long-term averages (Figure 2). The total catch rate of Striped Bass from the 2022 survey represents the third lowest catch rate on record since monitoring began in 1996. Further, the catch rate of Striped Bass ≥ 28 in was the ninth lowest catch rate recorded over the time series.

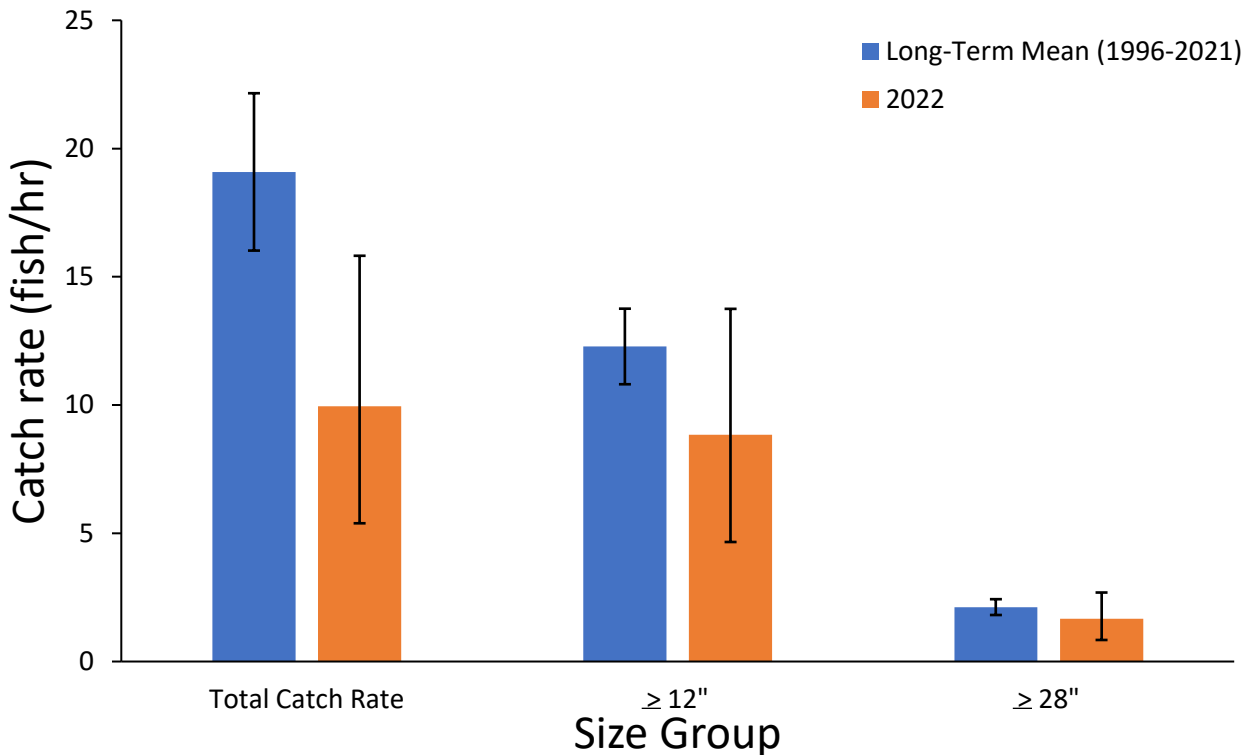


Figure 2. Electrofishing catch rates for Striped Bass captured in the Delaware Estuary between May 2 and 19, 2022 compared to corresponding long-term averages (1996 to 2021). Vertical black bars depict the 95% confidence intervals.

Pennsylvania Fish & Boat Commission Biologist Report

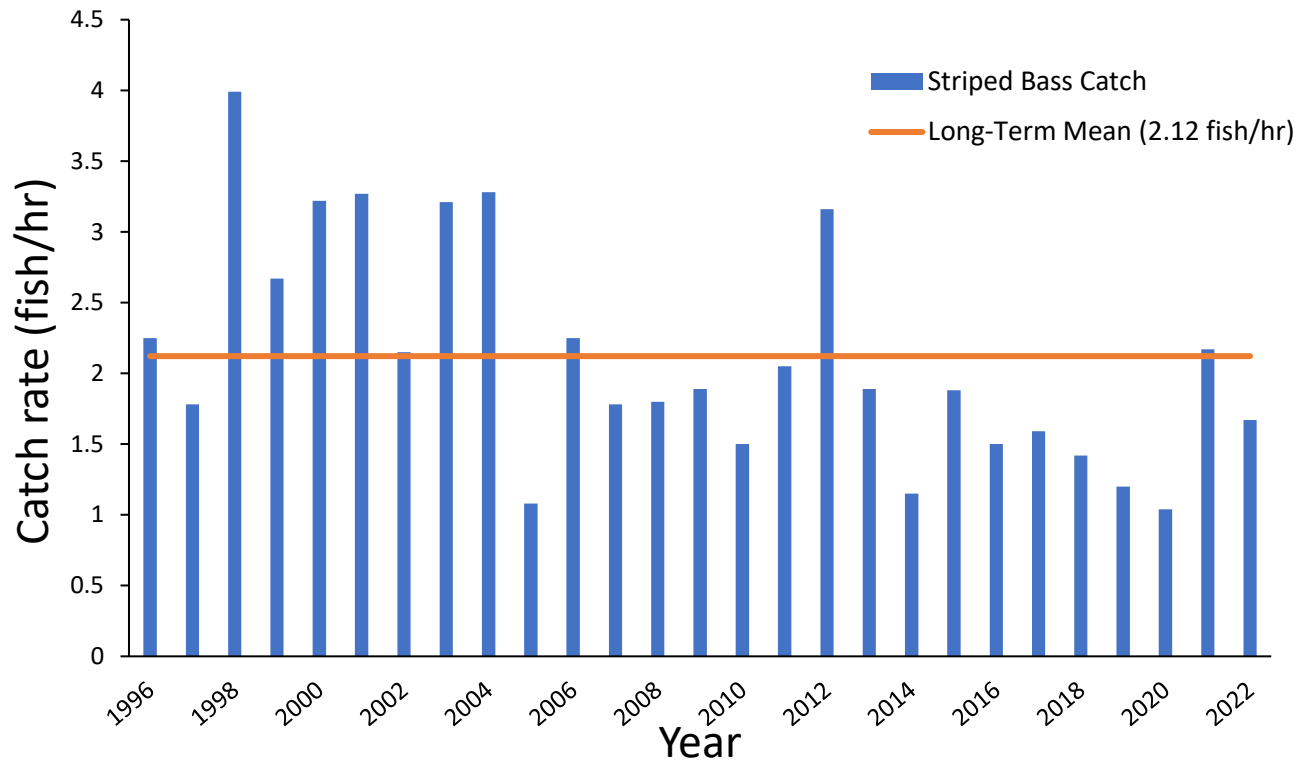


Figure 3. Catch rate of Striped Bass greater than 28 inches collected during the Striped Bass Spawning Stock Survey (1996-2022).

The catch rates of these larger fish had been declining for several years in Pennsylvania’s portion of the Delaware Estuary (Figure 3), and for the coastwide stock. This resulted in action being taken by the [Atlantic States Marine Fisheries Commission \(ASMFC\) in the fall of 2019](#) in an effort to reduce fishing mortality of the Striped Bass stock. Striped Bass of larger sizes (≥ 28 inches) are generally mature females (Figure 4) and comprise most of the spawning stock biomass. Therefore, limiting harvest of large fish is important to ensure these fish can spawn and contribute to the overall Striped Bass population. The recent Striped Bass stock assessment update from the ASMFC suggests the 2020 regulation change is having a positive impact on the spawning stock biomass. The [2022 Stock Assessment Update](#) found that while the stock is still overfished, overfishing is currently not occurring. This is evident in the most recent two years of data captured by the PFBC. Although the catch rate was below the long-term average in 2022, it was higher than those observed from 2016-2020 when the stock was trending steeply downward. While the higher catch rates are positive, the lack of consistent strong year classes that will sustain the fishery into the future is of concern to managers. For example, two year-classes (2017 and

Pennsylvania Fish & Boat Commission Biologist Report

2018) comprised approximately 40% of the total catch of Striped Bass collected from the Delaware Estuary in 2022.

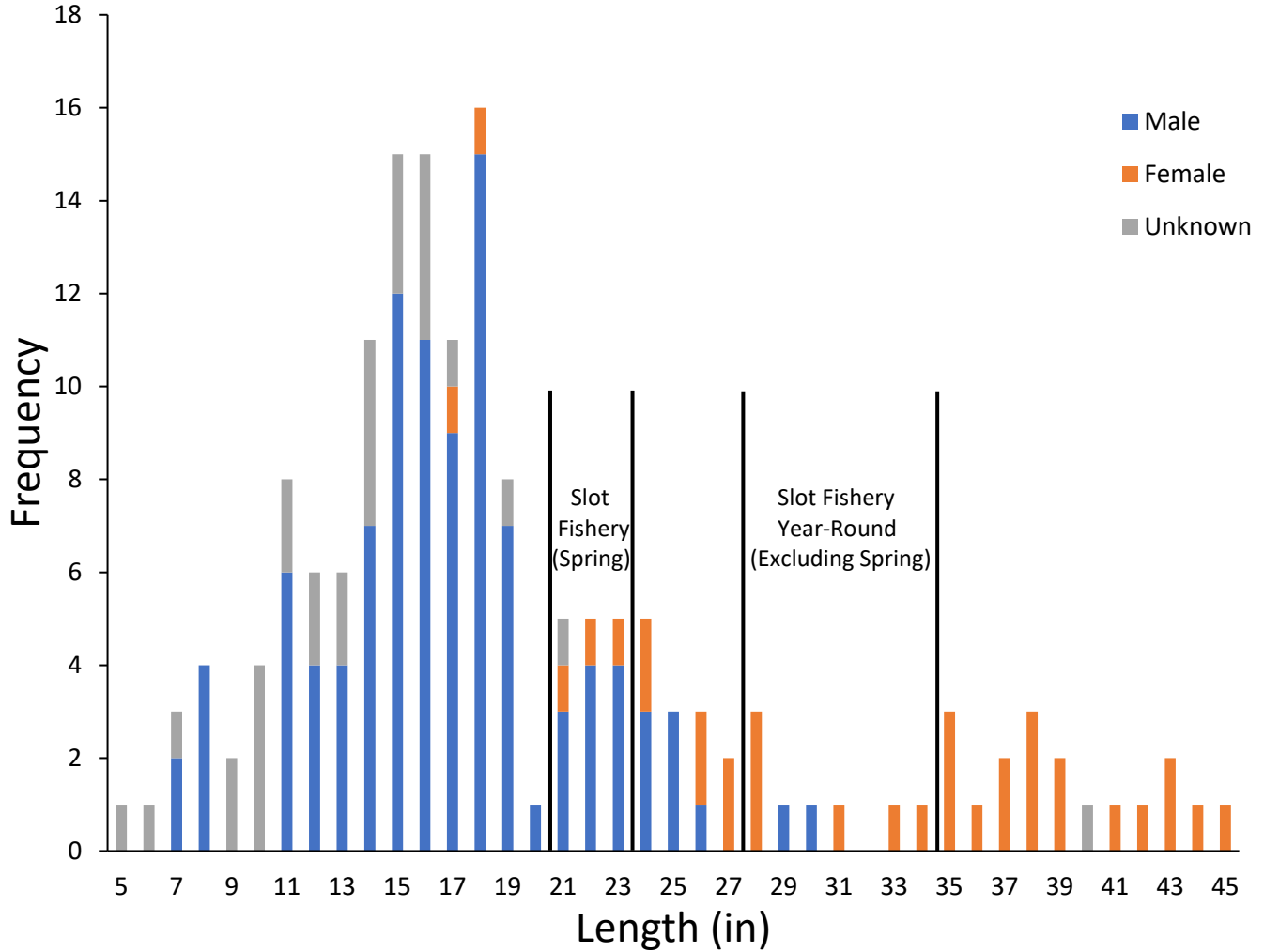
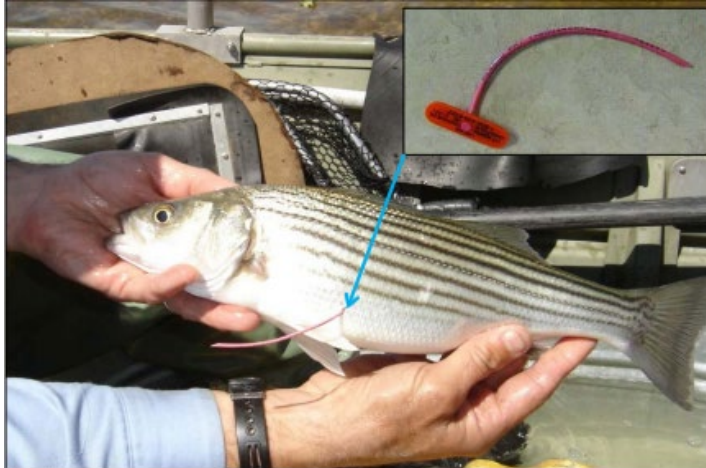


Figure 4. Length-frequency distribution of Striped Bass collected during the 2022 Striped Bass Spawning Stock Survey by sex. Bars denote harvestable fish ranges during their respective season.

Pennsylvania Fish & Boat Commission Biologist Report

In addition to monitoring abundance, a total of 179 Striped Bass ≥ 16 in were tagged with a pink colored U.S. Fish and Wildlife Service (USFWS) reward tag in 2022 (see photo), as part of a multi-state, coastwide effort. Information gathered from tagging programs is dependent on angler reports. Tag reports allow fisheries biologists to monitor coastal movement patterns, determine where fish are harvested, estimate annual fishing mortality, and document angler release rates.



Note the three-inch, pink, spaghetti-like tag near the tip of the left pectoral fin. Please report reward tags to the U.S. Fish and Wildlife Service by calling 1-800-448-8322.

Between 1995 and 2022, the PFBC has tagged a total of 6,117 Striped Bass in the Delaware Estuary. As of January 25, 2023, 15% of the 6,117 tagged fish were reported as caught. Recreational and commercial fishermen accounted for 89% and 7% of the tagged fish caught, respectively, while 4% were credited to other collectors, such as scientific researchers. Of the reported tags, 52% were caught and released; 47% were harvested; and 1% were found dead, dying, or captured while doing scientific research. Recreational and commercial fishermen harvested 46% and 78% of their Striped Bass catches, respectively. The ratio of female to male Striped Bass in the harvest was 1.5:1, indicating more harvest pressure on the female segment of the population. However, this ratio was likely influenced by the large number of tagged males that were too small to be legally harvested. Fish tagged by the PFBC have been caught from Maine to North Carolina. A large portion of these tagged fish were caught by anglers within the Delaware Bay (or in tributaries to the bay) and in the Atlantic Ocean off the coast of New Jersey (Figure 5).

Pennsylvania Fish & Boat Commission Biologist Report

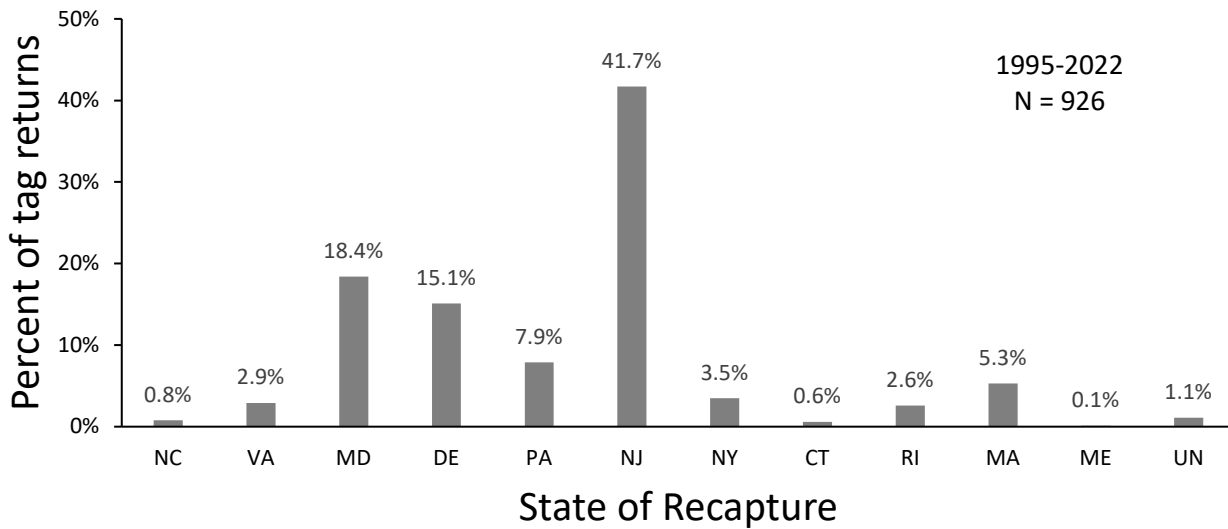


Figure 5. Percentage of tag returns by state of recapture for Striped Bass implanted with U.S. Fish and Wildlife Service anchor tags by the Pennsylvania Fish and Boat Commission during spawning stock surveys on the Delaware Estuary between 1995 and 2022.

Each time an angler reports a tagged fish (assuming accurate information is provided), biologists gather valuable information about their movements and growth. In 2022, anglers reported 24 fish that were previously tagged by PFBC biologists. Of these 24 fish, 8 were caught in the Delaware River and Delaware Bay, 8 were caught in the Chesapeake Bay, and 8 were caught at various locations along the Atlantic coast. A few of the recaptured fish in 2022 provided biologists with interesting information. A fish that was tagged during 2017 in the Delaware River near Morrisville, PA was recaptured in November 2022 from the Susquehanna River below Conowingo Dam. This fish represents the longest time at-large between capture and recapture events for 2022 angler reports. Two Striped Bass were caught by anglers within two days of being tagged. Both fish were tagged on May 23, 2022, at Trenton Falls. The first fish was recaptured the next day at Trenton, NJ and the other was recaptured two days later at Lambertville, NJ. These fish represent the shortest duration between capture and recapture events. The longest distance between tagging and recapture locations was 105 mi. This fish was tagged on May 2 near Chester, PA and was recaptured on May 11 in Maryland waters of the Chesapeake Bay. The ability for this fish to travel that distance in 9 days means that it most likely moved through the Chesapeake and Delaware (C&D) Canal.

Pennsylvania Fish & Boat Commission Biologist Report

An important component of the tagging program is collection of harvest (mortality) information. Harvest and catch-and-release rates vary across waterbodies (Figure 6). For example, harvest of Striped Bass in the Delaware River and Delaware Bay has been low for decades. Of the 8 fish recaptured in this system in 2022, only 1 was harvested. Alternatively, 8 fish were recaptured in the Chesapeake Bay and all were harvested (by recreational or commercial fishermen), a trend that has been observed for fish tagged in the Delaware River and recaptured in the Chesapeake Bay.

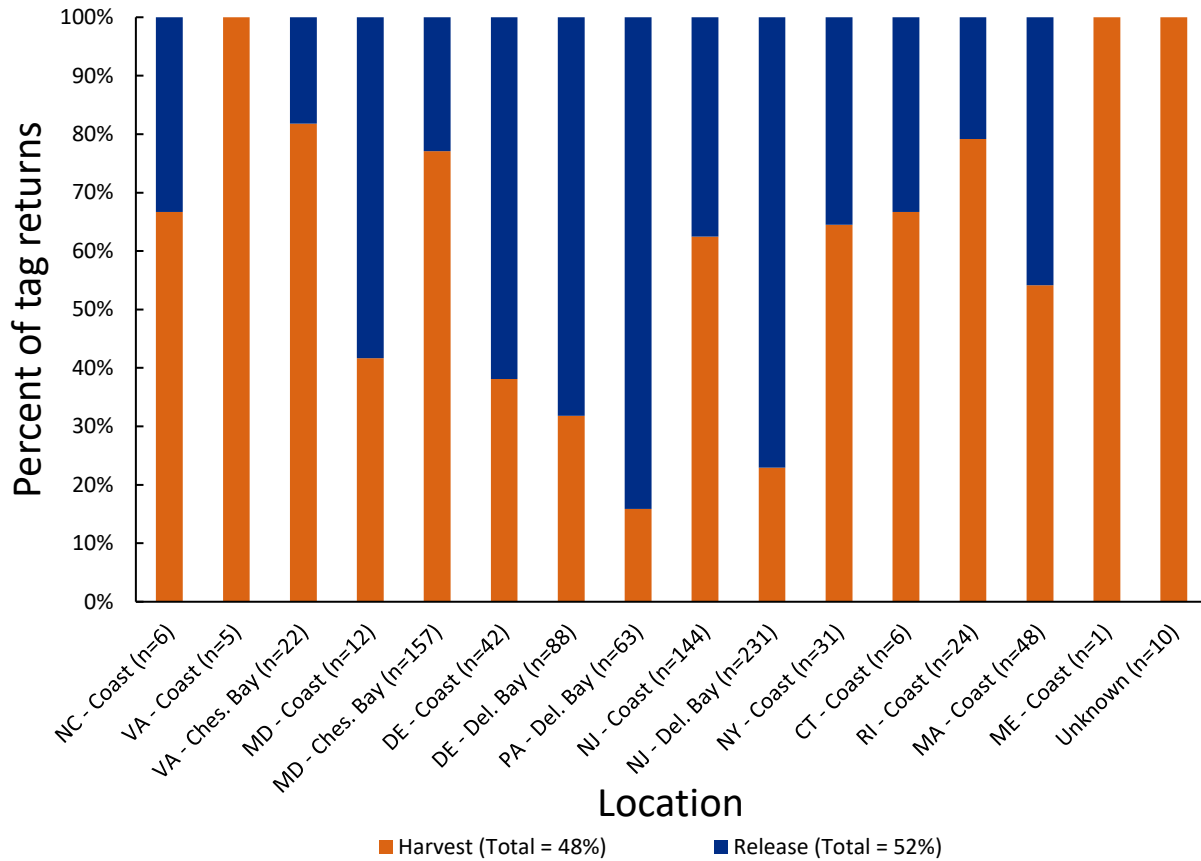


Figure 6. Harvest and release rates (by state and waterbody) of Striped Bass based on tag return data, 1995-2022. Numbers in parentheses next to each waterbody indicate sample size.

Table 1 provides the current size and creel limits for the 2023 Striped Bass season, as well as new restrictions regarding the gaffing of Striped Bass. Further, Figure 7 highlights the new rule put in place in 2020 requiring the use of non-offset circle hooks when fishing with bait in the Delaware Estuary, regardless of species being targeted. Anglers are also advised that New Jersey regulations apply if they cross the PA/NJ boundary line, which is delineated as the approximate middle of the channel. Also, in addition to possessing a valid Pennsylvania fishing license, anglers targeting Striped Bass in the Delaware River and Estuary below Trenton Falls are required to register through the PFBC’s free on-line Saltwater

Pennsylvania Fish & Boat Commission Biologist Report

Angler Registry through the huntfish.pa.gov webpage. Likewise, if fishing across the state line in New Jersey, Pennsylvania anglers must also register in the free [New Jersey Saltwater Recreational Registry Program](#).

Table 1. Regulations for the Striped Bass fishery in the Delaware River and Estuary, including tributaries from the mouths of the tributaries upstream to the limit of tidal influence. Note the upper slot numbers of 24 and 35 inches are not inclusive, meaning it is illegal to harvest fish ≥ 24 or ≥ 35 inches for each respective slot length limit.

Location	Length Limit	Bag Limits	Other	Open Season
Pennsylvania Delaware Estuary <i>PA/DE state line upriver to Calhoun St. Bridge at Morrisville, PA (56 river-miles)</i>	21" to less than 24"	2	In-line (non-offset) circle hooks required when fishing with bait. It is unlawful for any person to gaff or attempt to gaff any Striped Bass at any time when fishing	4/1 - 5/31
	28" to less than 35"	1	In-line (non-offset) circle hooks required when fishing with bait. It is unlawful for any person to gaff or attempt to gaff any Striped Bass at any time when fishing	1/1 - 3/31, 6/1 - 12/31
Pennsylvania Delaware River (non-tidal) <i>Calhoun St. Bridge upriver (196 river-miles)</i>	28" to less than 35"	1	In-line (non-offset) circle hooks recommended when fishing with bait. It is unlawful for any person to gaff or attempt to gaff any Striped Bass at any time when fishing	1/1-12/31



Figure 7. Approved in-line (non-offset) hook type for use in the Delaware Estuary.

*Image courtesy of the Virginia Marine Resources Commission

Pennsylvania Fish & Boat Commission Biologist Report

Anglers wishing to consume Striped Bass or other species of fish in the Delaware Estuary and River are advised to consult the fish consumption advisory information on page 37 of the [Pennsylvania Fishing Summary Booklet](#). There is currently a one meal per month advisory for Striped Bass 28 inches to less than 35 inches in length. Slot-sized Striped Bass (21 to less than 24 in) are now covered by the general statewide advisory of one meal per week for recreationally caught sportfish.

Tyler Grabowski – Area 6 Fisheries Biologist

Mike Porta – Area 6 Fisheries Manager