

Lake Welch Centrarchid Survey (Survey #323005)

Robert D. Adams, Region 3 Fisheries

June 2023

Lake Welch is a 205-acre waterbody in northeast Rockland County that supports a robust warmwater fishery. As it lies entirely within Harriman State Park, shoreline angling is available around much of the lake. A Palisades Interstate Park Commission permit allows boating access via cartop boat launch, located off Seven Lakes Dr (Figure 1). Only electric motors are permissible on the lake, and ice fishing is allowed when the State Park deems conditions to be safe.

In 2022, two regulation changes applied to panfish found in Lake Welch. First, an experimental eight-inch minimum size, with a 15 fish daily limit for sunfish was implemented on April 1, 2022, as part of the Big Panfish Initiative (NYSDEC 2021). Secondly, the statewide minimum length for black crappie changed from nine to ten inches. The 2023 survey was the third in a five-year plan (Loukmas 2021) to evaluate the response of the panfish population to the new regulations. Prior to 2021, warmwater fish were evaluated through electrofishing in 1993, 2004 and 2019.

The 2023 trap netting survey followed the New York Sunfish and Crappie Trap Netting Protocol (Loukmas 2021). Two overnight net sets were made in the same locations on 6/5/23 and 6/6/2023 for a total of six net nights (Figure 1). The mean surface water temperature for the two sample days was 67.9°F, roughly six degrees colder than 2022 and over four degrees warmer than 2021 (see Table 1). As in previous years, all sunfish and black crappie caught in 2023 were measured for total length, with scales and otoliths removed in a subsample of each species. Ages on both structures were determined by multiple agers and consensus ages were used to predict ages of unaged fish.

The 2023 catch rates for all target species, except redbreast sunfish, were lower than those observed in

**Table 1. Annual catch rates of target species (total catch in parentheses)**

Year	Dates	Net nights	Temperature (°F)	Black Crappie	Bluegill	Pumpkinseed	Redbreast	Sunfish*
2021	Jun 1-3	12	63.5	9.7 (116)	5.7 (68)	6.7 (80)	0.2 (2)	12.5 (150)
2022	May 31-Jun 1	7	74.3	10.9 (76)	30.9 (216)	5.7 (40)	0.6 (4)	37.1 (260)
2023	Jun 5-6	6	67.9	3.3 (20)	11.8 (71)	3.5 (21)	0.8 (5)	16.2 (97)

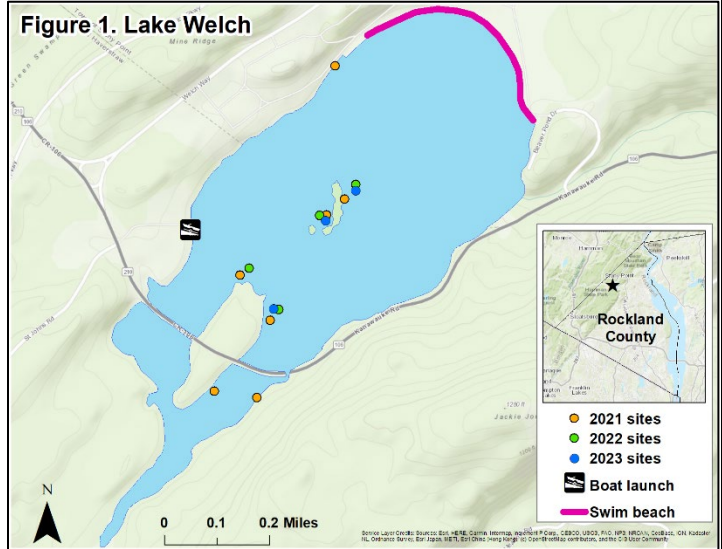
\*combined bluegill, pumpkinseed and redbreast

2022, with black crappie and pumpkinseed rates the lowest of the three years (Table 1). The total catch rate of all sunfish combined was under half of that observed in 2022 but similar to results from 2021. At only 3.3 fish caught per net night, black crappie had the most noticeable decline from prior years.

Annual length proportions and relative stock densities (RSD) of target species are shown in Figure 2 (see Table 2 for relative size class definitions). The 2023 bluegill catches were dominated by five to seven-inch fish, resulting in the highest density of catchable fish over six inches (PSD or RSD<sub>Q</sub>) and lowest proportion of catchable fish over eight inches (RSD<sub>P</sub>) in the time series. As in previous years, nearly all 2023 pumpkinseeds were between six and nine inches. No sunfish measured 10 inches or greater in any survey year. The 2023 black crappie size range was the narrowest in the timeseries, but the proportion of catchable black crappie 12 inches or greater (RSD<sub>M</sub>) was the highest in the time series. The relatively high proportion of eight-inch black crappie in 2023 may signify a large year class occurred in 2020 or 2021.

**Table 2. Defined lengths (in) for relative stock density evaluations (Brooking et al. 2018)**

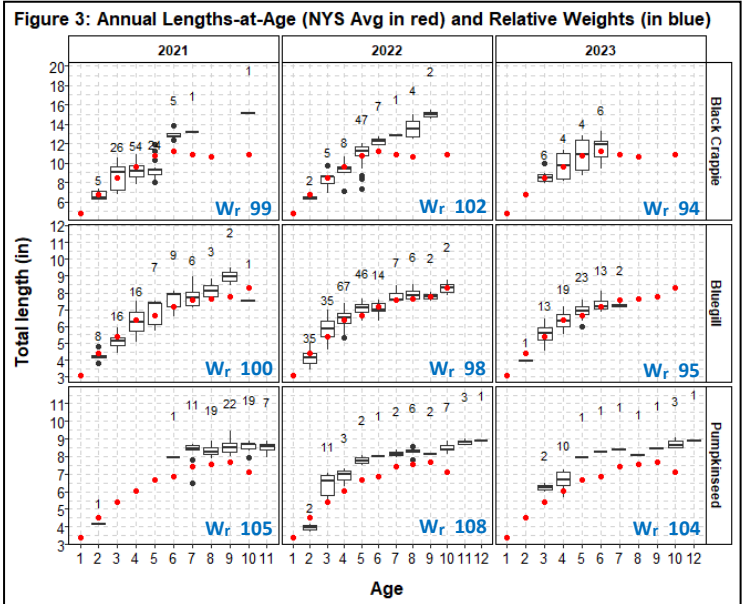
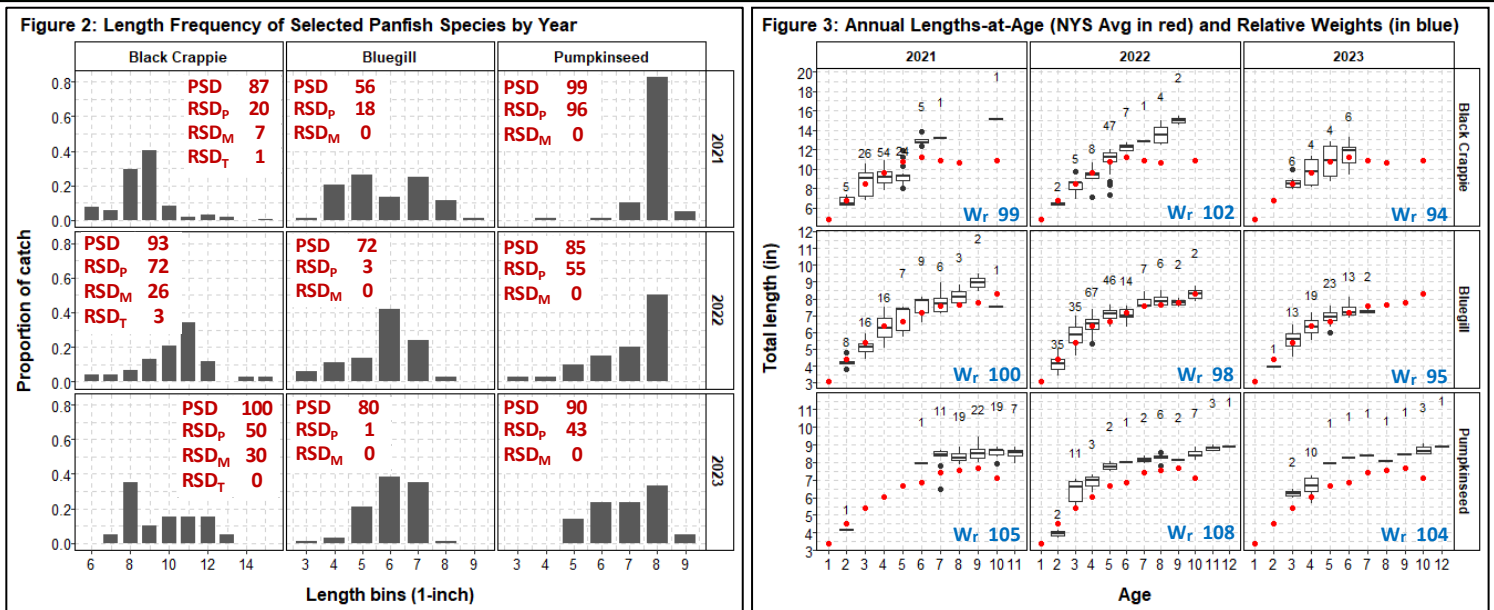
Target	Stock (S)	Quality (Q)	Preferred (P)	Memorable (M)	Trophy (T)
Sunfish spp	3"	6"	8"	10"	12"
Black Crappie	5"	8"	10"	12"	15"



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Lengths-at-age and relative weights ( $W_r$ ) are metrics used evaluate growth patterns. As shown in Figure 3, bluegill lengths at age are very similar to statewide averages (red dots on plot) for all ages and BPI survey years, while those for pumpkinseed are consistently larger than statewide averages. Lengths of black crappie in Lake Welch are comparable to statewide means up to age six but are consistently larger at older ages. Annual mean relative weights are displayed in blue in Figure 3. A relative weight of 100 indicates the weight observed matches the weight expected based on the observed length. Therefore, a  $W_r$  below 100 indicates poorer than expected growth and values above 100 indicate better than expected growth. Though 2023 relative weights for all target species were the lowest in the time series, they only slightly deviated from target value of 100. Both metrics indicate average panfish growth conditions in the lake.

It is important to note the 2023 survey took place during a week of heavy smoke and ash deposition from Canadian wildfires. Though not assessed in 2023, extensive ash deposition can impact thermal profiles as well as biogeochemical and food web processes through decreased light attenuation, increased suspended concentrations of nutrients and toxins, and changes in pH (Farruggia et al 2023). This may have influenced the catchability of panfish in the survey. Future protocols will include depth profiles of temperature and dissolved Oxygen, surface water chemistry, and secchi readings. Trap net surveys will continue through 2025 to assess panfish size-structures and recruitment, with an extensive report to follow.

**Literature Cited:**

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