

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
PERFORMANCE REPORT

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PROJECT TITLE: Chesapeake Bay Finfish / Habitat Investigations.

PROGRESS: ANNUAL X

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Executive Summary

The primary objective of the Chesapeake Bay Finfish / Habitat Investigations Survey is to biologically characterize and monitor resident and migratory finfish species in Maryland's portion of the Chesapeake Bay and examine fish-habitat interactions. This Survey provides information regarding recruitment, relative abundance, age and size structure, growth, mortality, and migration patterns of finfish populations in Maryland's Chesapeake Bay. The data generated is used in both intrastate and interstate management processes and provides a reference point for future fisheries management considerations.

White perch population abundance, instantaneous fishing mortality (F), and recruitment trends were determined using a surplus production model. Bay-wide biomass and fishing mortality estimates were compared to biological reference points. Model results indicated steady population growth from 1980 – 1993. Biomass declined slightly through 2002, and was stable through 2007. Biomass was approximately 30% greater than B_{msy} , a parameter generated by the model that can be used as a biological reference point. Since biomass was greater than B_{msy} , white perch stocks were not considered over-fished. Instantaneous fishing mortality was high in the early 1980's, and declined to a time series minimum in 1990. Fishing mortality then increased from 1990 through 2005. Fishing mortality declined in 2006 and 2007 to levels lower than any year since 1995. The 2007 F estimate was below the suggested biological reference point that indicates that over-fishing was not occurring. Bay-wide juvenile production was generally high during 1993 – 2008, but juvenile production was below average in 2006 and 2008. Choptank River white perch stocks were assessed with a catch survey analysis. The model indicated increasing population growth since 1989, and was estimated to be near 6 million fish in 2007. A suite of biological reference points were produced in a previous assessment and compared to F estimates generated for Choptank River white perch. Fishing mortality in the Choptank River exceed the proposed target from 1991 through

2002, but has been below the target F rate since 2002. These results indicated that over-fishing was not occurring in the Choptank River.

Adult American shad stocks in Maryland have declined precipitously since 2001 even though significant improvements have been accomplished in water quality and habitat. The complexity of the problem is both a localized issue involving Chesapeake Bay tributary by-catch and ocean by-catch, fish lift losses on the Susquehanna River and coastal and Chesapeake Bay predation. Bay wide juvenile American shad production decreased in 2008 and may be attributed to very low spawning stock biomass. The dramatic declines in American shad stocks are being addressed through the Atlantic States Marine Fisheries Commission's (ASMFC) Amendment 3 and action by the Management Board should occur during 2010.

Adult hickory shad relative abundance indices in Deer Creek remained stable but Nanticoke River indices remained at low levels and may not accurately depict the status of adult stocks in this system. Juvenile sampling encountered few hickory shad and the low numbers appears directly related to sampling gear aversion. In general, hickory shad stocks are not significantly affected by ocean by-catch and predation as reflected in the low estimated total mortality rates. Consequently, Maryland Chesapeake Bay stocks of this species appears stable.

Adult alewife and blueback herring stocks in Maryland remained at very depressed levels. This is indicated by the low adult indices from the Nanticoke River, statewide landings being less than four percent of the high for the time series, and high estimated total mortality rates. Juvenile indices were also very low in 2008 and may be indicative of adult abundance below some critical threshold level necessary for stock stabilization and future growth. ASMFC's Management Board is also preparing to act on Amendment 2 which will likely reduce fishing mortality for both species and should include both coastal recommendations and in-state mandates.

Weakfish have experienced a sharp decline in abundance coast wide. Recreational catch estimates by the National Marine Fisheries Service (NMFS) for Maryland fell steadily from 475,348 fish in 2000 to 493 fish in 2006 and remained low in 2007 (11,910 fish). Maryland's commercial weakfish harvest declined to 11,910 pounds in 2007, and was the lowest catch on record. The 2008 mean total length (TL) for weakfish from the pound net survey was 276 mm TL, the third lowest of the time series. The 2008 length frequency distribution and RSD analysis indicated that only smaller weakfish were available in Maryland waters. Fish aged from the 2007 pound net survey were all 4 years of age or younger.

Summer flounder mean length from the pound net survey was 347 mm TL in 2008, close to the 15 year survey average. Relative stock densities in 2008 indicated a shift up from the stock category to the quality and preferred category compared to 2007. Both commercial and recreational harvest of summer flounder increased in 2007. The NMFS 2006 coast wide stock assessment concluded that summer flounder stocks were not overfished, but that overfishing was occurring.

Mean length of bluefish from the 2008 pound net survey was 260 mm TL, 2nd lowest of the 1993-2007 survey. Length distribution and RSD analysis indicated a shift back to smaller bluefish

in 2008. Both recreational and commercial bluefish harvest levels increased in 2007, but were still below average for Maryland. The latest coast wide stock assessment indicated the stock was not overfished and overfishing is not occurring.

The mean length of Atlantic croaker examined from the pound net survey in 2007 was 298 mm TL, average for the time series. Length frequency distribution and RSD analysis for Atlantic croaker indicated a broadening of the size structure in 2008. Fish aged from the 2007 pound net survey ranged in age from 1 – 12 years old. Maryland Atlantic croaker total commercial harvest increased in 2007 (474,338 pounds), as did the 2007 recreational harvest, estimated at 1,092,784 fish.

Spot length frequency distribution continued to truncate in 2008, and the mean length was the 6th lowest of the time series. Juvenile indices have been lower in recent years than the long-term average, but did increase in 2008. Commercial and recreational harvest increased sharply in 2007. The percent of spot over 254 mm TL in the 2008 pound net samples was less than one percent, which was lower than the previous 5 years.

Resident / premigratory striped bass present in the Chesapeake Bay during the summer – fall 2007 pound net and hook and line commercial fisheries ranged from 2 to 14 years of age. Four year old striped bass from the 2003 year-class dominated samples taken from pound nets, composing 51% of the sample in 2007. Check station sampling determined that the majority of the pound net and hook-and-line fishery harvest was composed of four and five year old striped bass from the 2002 and 2003 year-classes.

The 2007-2008 commercial striped bass drift gill net fishery harvest was comprised primarily of fish between 4 and 7 years old from the 2001, 2002, 2003 and 2004 year-classes. Striped bass from the 2003 year-class comprised 51% of the total drift gill net harvest. Year-classes 2004, 2002, and 2001 (ages 4, 6, and 7) made up 35% of the total harvest while age 8 to 14 year-old fish contributed 13% to the total. Striped bass present in commercial drift gill net samples collected from check stations ranged in age from age 3 to 14 (1994 – 2005 year-classes).

The spring, 2008 spawning stock survey indicated that there were 15 age-classes of striped bass present on the Potomac River and Upper Bay spawning grounds. These fish ranged in age from 2 to 18 years old. Age 4 (2004 year-class) and age 5 (2003 year-class) male striped bass were the most abundant component of the male striped bass spawning stock. Age 12 (1996 year-class) females were the major contributors to 2008 total female abundance. Age 8 and older females comprised 95% of the female spawning stock in 2008. The Chesapeake Bay striped bass spawning stock remains healthy and is closely monitored by MD DNR biologists in partnership with other coastal states through the Atlantic State's Marine Fisheries Commission.

The 2008 striped bass juvenile index, a measure of striped bass spawning success in Chesapeake Bay, was 3.2, below the long-term average of 11.7. During the survey DNR biologists

collected 422 young-of-year (YOY) striped bass. Healthy striped bass populations are known for such highly variable spawning success. This is only the third time in the past decade that striped bass reproduction in Maryland's Chesapeake Bay has been below average. Two of the most successful spawning years ever documented (2001 and 2003) also occurred during this past decade. Typically, several years of average reproduction are interspersed with occasional large and small year-classes.

Poor reproduction was also observed for other spring-spawning species such as white perch and American shad, leading biologists to suspect that large-scale environmental factors were responsible. Heavy rains in early May resulted in decreased water temperatures on major striped bass spawning grounds. The spring water temperatures fell below levels known to be lethally cold to striped bass eggs and larvae, and survival of these sensitive life stages is a major determinant of spawning success.

During the 2008 trophy season, biologists intercepted 271 fishing trips, interviewed 329 anglers, and examined a total of 200 striped bass. The average total length of striped bass sampled was 920 mm TL (36.2 inches), and the average weight was 7.8 kg (17.2 lbs). Most fish sampled from the trophy fishery were between nine and twelve years old. The 1996 year-class (age 12) and 1997 year-class (age 11), were the most frequently observed year-classes, constituting 45.6% of the sampled harvest. Average catch rate based on angler interviews was 0.3 fish per hour a drop from the catch rate of 0.5 fish per hour in 2007.

A total of 1,161 striped bass were tagged and released for growth and mortality studies during the spring, 2008 sampling season with USFWS internal anchor tags. Of this sample, 628 were tagged in the Chesapeake Bay during spring spawning stock assessment activities. A total of 1,033 striped bass were tagged during the cooperative USFWS / SEAMAP Atlantic Ocean tagging cruise. Specialized coded wire tag (CWT) sampling was continued on the Patuxent River during 2008. A total of 82 striped bass were scanned for the presence of CWT's, but none were found to be CWT positive.

Stream ichthyoplankton sampling was conducted in Mattawoman Creek, Piscataway Creek and Bush River watersheds in 2008. Mattawoman Creek and Piscataway Creek data were compared to historic data to determine if spawning habitat use had changed. Piscataway Creek samples showed a complete absence of eggs and larvae, indicating the habitat supported little, if any, anadromous fish spawning. Mattawoman Creek samples showed that anadromous fish continued to use the watershed to spawn, however, fewer stations showed presence of anadromous eggs and larvae, indicating that spawning habitat use has declined.

Data from 2005 to 2008 were compared from the Bush River and Aberdeen Proving Ground and evaluated to determine the status of spawning habitat. Yellow perch and white perch were rare in the Bush River, even though historically, the Bush River supported spawning for both species. Aberdeen Proving Ground historically supported yellow perch and white perch spawning and recent sampling showed continued spawning of both species. Percent presence of eggs and larvae of each species was compared to impervious cover estimates. Results suggest that land development is impacting the quality of habitat and reducing the amount of stream habitat available for their spawning. River herring were observed at numerous sites in both the Bush River and Aberdeen Proving Ground, indicating that habitat change is not impacting their use of these areas for spawning.

During 2008, L_p (proportion of estuarine tows containing yellow perch larvae) fell below the historic range in the Severn, South and Nanticoke Rivers. In the three tidal-fresh systems, Mattawoman Creek, Piscataway Creek and Bush River, L_p fell within the historic range. The risk of falling below the historic minimum was near 1 for brackish systems and near 0 for tidal-fresh systems. High salinity and high impervious surface in the watershed are attributed to the low L_p in the brackish habitats.

All systems sampled in 2007 were revisited in 2008, with the exception of Piscataway Creek as submerged vegetation was too dense to effectively operate gear. Nanjemoy Creek was substituted for Piscataway Creek. Water quality criteria violations were minimal in all rivers. Impervious cover did not appear to impact water quality or fish populations within the systems sampled. The threshold for impervious cover impacts may be higher in tidal-fresh systems than that previously established for brackish systems.

APPROVAL

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