

Research Priorities and Recommendations to Support Interjurisdictional Fisheries Management

BLACK DRUM

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HIGH PRIORITY

- Develop fishery-independent adult surveys. Consider purse seine and long line surveys with bait and sampling areas appropriate to target black drum. Collect age samples, especially in states where maximum size regulations preclude the collection of adequate adult ages. *long-term*
- Conduct a high reward tagging program to obtain return rate estimates. Continue and expand current tagging programs to obtain total mortality, catch and release mortality, and growth information and movement-at-size data. *long-term*
- Increase biological sampling in commercial fisheries, particularly gill nets in Virginia, to better characterize size and age composition of commercial landings. These data would help improve data sets for selectivity estimates and eventual extensions to length/age-structured assessment approaches. *long-term*
- Increase biological sampling in recreational fisheries, particularly harvest in the Mid-Atlantic region and releases coastwide, to better characterize size and age composition of recreational catch. These data would help improve data sets for selectivity estimates and eventual extensions to length/age-structured assessment approaches. *long-term*
- Continue all current fishery-independent surveys recommended as stock indicators for black drum and collect biological samples for black drum on all surveys. *long-term*
- Evaluate use of MRIP site-use weighting factors to improve CPUE estimates. *short-term*
- Skate and Itarget with their current data inputs should be evaluated as annual indicators to show current relationships between stock and removals (Itarget) and the ongoing trend of relative F (Skate). *short-term*
- A process should be developed for appropriately combining MRIP and supplemental recreational sampling program data for characterizing the size structure of the recreational harvest. The process needs to consider spatial information, as there are likely spatial effects within states' supplemental sampling programs (e.g., VMRC Freezer Program representing Eastern Shore harvest). *short-term*

MODERATE PRIORITY

- Age otoliths that have been collected and archived (\approx 500 sub-adults samples from GA). *short-term*

- Improve sampling of concentrated, targeted nighttime fisheries in the Mid-Atlantic region (e.g., Delaware Bay). Although the MRIP APAIS design changed to expand to nighttime sampling, data are too limited (e.g., only four potential nighttime black drum intercepts in DE APAIS data) to evaluate whether this change was sufficient for black drum fisheries. **long-term**
- The recreation released alive trend and harvest trend provided a mixed signal. In order to identify which factor, a change in stock abundance vs. a change in fishing behavior, drove the mixed signal, we analyzed the released alive data by breaking them down by wave. However, such an analysis may provide limited information on fishing behavior change, therefore, we recommend to directly collect such information via a one-time pilot study (≈three years) during existing creel surveys (e.g., MRIP APAIS). For example, anglers may report if they know where, when, and how to catch legal black drum (potentially increasing catch rate) meanwhile deliberately avoiding catching sublegal fish (potentially decreasing released alive quantity). Anglers don't need to share their specific skills during the creel survey by simply checking a box before "When", "Where", and "How" along with targeted species data currently collected. Such information may potentially provide better information to understand drivers of these trends in the future stock assessment. **short-term**
- Conduct tagging study to determine survival, migration, and contribution of YOY fish spawned in the Mid-Atlantic to the overall sub-adult stock. **long-term**

LOW PRIORITY

- Expand simulation-based power analysis to other index data sets used for stock indicators of black drum. **short-term**
- Conduct reproductive studies that provide updated estimates and an expanded spatial coverage, including: age and size-specific fecundity, spawning frequency, spawning behaviors by region, and movement and site fidelity of spawning adults. **long-term**
- There is uncertainty about selectivity between gill net types fished (anchor and drift) in Virginia and the appropriateness of combining these gears into a fleet. There are no composition data collected from drift gill nets, so this remains an uncertainty that should be researched in the future. **short-term**

PARTIALLY ADDRESSED RECOMMENDATIONS FROM THE 2015 STOCK ASSESSMENT

- Collect genetic material (i.e., create "genetic tags") over a long time span to obtain information on movement and population structure, and potentially estimate population size. **See Section 2.1 and Leidig 2014.**
- Obtain better estimates of harvest from the black drum recreational fishery (especially in states with short seasons). **MRIP changes discussed in Section 4.2.1.1 were generally seen as improvements to catch estimates, though the exception remains nighttime fishery sampling identified as a moderate research recommendation above.**
- Collect information on the magnitude and sizes of commercial discards. Obtain better estimates of bycatch of black drum in other fisheries, especially juvenile fish in south Atlantic states. **An ongoing observer program now provides monitoring of the primary**

suspected commercial black drum discard fishery (Section 4.1.1.2). Recent estimates have been small in comparison to total fishery removals, but this source of catch should continue to be monitored in future stock assessments for signs of increase. South Atlantic shrimp trawl fishery observer data were also reviewed during this assessment and do not indicate these fisheries are a significant source of black drum fishery removals.