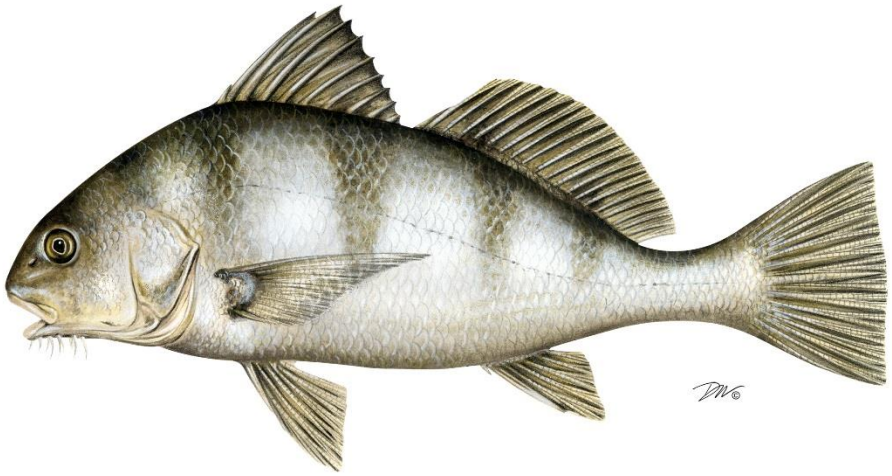
2018 REVIEW OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT PLAN FOR

BLACK DRUM (*Pogonias cromis*)

2017 FISHING YEAR



The Black Drum Plan Review Team
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I. Status of the Fishery Management Plan

Date of FMP Approval:	Original FMP – June 2013
Management Areas:	The entire Atlantic coast distribution of the resource from New Jersey through the east coast of Florida
Active Boards/Committees:	South Atlantic State/Federal Fisheries Management Board; Black Drum Technical Committee, Stock Assessment Subcommittee, Plan Review Team; South Atlantic Species Advisory Panel

The Atlantic States Marine Fisheries Commission (ASMFC) adopted an interstate Fishery Management Plan (FMP) for Black Drum in 2013. Prior to the FMP, management was state-specific, from no regulations in North Carolina to various combinations of size limits, possession limits, commercial trip limits, and/or annual commercial quotas from New Jersey to Florida. The Maryland portion of the Chesapeake Bay was closed to commercial fishing in 1998.

The FMP requires all states with a declared interest in the species to have established a maximum possession limit and minimum size limit of at least 12 inches by January 1, 2014, and to have increased the minimum size limit to at least 14 inches by January 1, 2016. The FMP also includes a management framework to adaptively respond to future concerns or changes in the fishery or population.

There are four plan objectives:

- Provide a flexible management system to address future changes in resource abundance, scientific information, and fishing patterns among user groups or area.
- Promote cooperative collection of biological, economic, and sociological data required to effectively monitor and assess the status of the black drum resource and evaluate management efforts.
- Manage the black drum fishery to protect both young individuals and established breeding stock.
- Develop research priorities that will further refine the black drum management program to maximize the biological, social, and economic benefits derived from the black drum population.

The management unit for black drum under the FMP is defined as the range of the species within U.S. waters of the northwest Atlantic Ocean, from the estuaries eastward to the offshore boundaries of the Exclusive Economic Zone (EEZ).

In 2018, Addendum I allowed Maryland to reopen their commercial fishery in the Chesapeake Bay, starting in the 2019 fishing year (ASMFC 2018). Prior to this addendum, a commercial moratorium was in place for these waters due to the FMP's requirement that states maintain measures in place at the time of the FMP's approval.

II. Status of the Stocks

In the 2015 Black Drum Benchmark Stock Assessment, the Stock Assessment Subcommittee (SAS) selected the Depletion-Based Stock Reduction Analysis (DB-SRA; Dick and McCall 2011) as the preferred method for estimating catch reference points. The SAS considered the Depletion-Corrected Average Catch (DCAC; McCall 2009) analysis, but ultimately rejected this method. DCAC did not incorporate removals into a population dynamics process, and uncertainty existed over how changes in the exploitation rate time series may impact the sustainable yield relative to the current stock condition.

Based on the DB-SRA results, black drum life history, indices of abundance, and history of exploitation, the black drum stock is not overfished and not experiencing overfishing (ASMFC 2015). Median biomass exhibited slow and steady decline from 135.2 million pounds in 1900 to 90.78 million pounds in 2012, though the median biomass estimate in 2012 is still well above the necessary level to produce maximum sustainable yield (B_{MSY}; 47.26 million pounds) (Figure 1). The median maximum sustainable yield (MSY) estimate is 2.12 million pounds and provides an annual catch target that can be used to sustainably manage the fishery. The median overfishing limit (OFL) estimate is 4.12 million pounds and provides a catch threshold that indicates overfishing when exceeded. The OFL is the maximum exploitation rate at the current biomass that does not lead to overfishing.

III. Status of the Fishery

This report includes updated recreational estimates from the Marine Recreational Information Program's transition to the mail-based Fishing Effort Survey (FES) on July 1, 2018. Therefore, recreational estimates will likely be different from those shown in past FMP Reviews and state compliance reports (due annually on July 1) through 2018. Figure 2 shows coastwide recreational landings including estimates using both the previous Coastal Household Telephone Survey (CHTS) and FES calibration for comparison, but other figures, tables, and text will only show data based on the FES calibration. Data based on either survey can be referenced at: https://www.st.nmfs.noaa.gov/st1/recreational/queries/.

Total black drum landings from New Jersey through the east coast of Florida are estimated at 6.6 million pounds in 2017, a 5% decrease from total harvest in 2016 (Tables 2 and 3, Figure 3). 2017 harvest is 1.7% below the previous ten-year (2007-2016) average. The commercial and recreational fisheries harvested 4.4% and 95.6% of the 2017 total, respectively.

Commercial landings of black drum span from New Jersey through Florida, excluding the Maryland portion of the Chesapeake Bay (Table 2). Coastwide commercial landings show no particular temporal trends, ranging from approximately 120,000 to 400,000 pounds annually over the last 13 years (Figure 3). Black drum commercial landings in 2017 were estimated at 294,396 pounds, a 35% decrease from those of 2016. North Carolina led commercial harvest with 62% of the landings, followed by Virginia and Florida with 15% and 14%, respectively (Table 2).

Recreational harvest of black drum peaked by weight in 2008 at 10.7 million pounds (Table 3) and by numbers of fish in 2003 at 2.3 million (Table 4). Since 2000, weight has fluctuated without trend between 3.3 and 10.7 million pounds, and numbers of fish have fluctuated between 890 thousand and 2.9 million fish (Figures 3 and 4).

Average weight (recreational harvest in pounds divided by recreational harvest in numbers) in 2017 was 3.64 pounds per fish, an 11% increase from 2016. Years that have shown large increases in coastwide average weight (i.e. increases to recreational harvest in pounds without proportional increase to recreational harvest in numbers) have typically occurred during years when Mid-Atlantic states (Virginia-New Jersey) have caught increased percentages of the coastwide recreational harvest (Tables 3 and 4).

The 2017 recreational harvest (1.7 million fish or 6.3 million pounds) represents an 8% decrease in numbers and a 2% decrease in pounds from the previous ten year (2007-2016) average. Florida anglers landed the largest share of the coastwide recreational harvest in numbers (60%), followed by North Carolina (20%) and South Carolina (14%). Since the beginning of the recreational time series (1981) anglers have released increasing percentages of caught fish, with percentages of recreational fish released exceeding 70% in each of the past 4 years. In 2017, 78% (6.1 million fish) of the recreational catch was released (Figure 4, Table 5). It is worth noting that release rates seemingly plateaued around 50% from the late 1990s through 2013, when the FMP took effect, establishing minimum sizes in every state and requiring that undersized drum be released for the first time. Recent high release rates can be attributed to these measures, as well as encouragement of catch and release practices.

IV. Status of Assessment Advice

Current stock status information comes from the 2015 benchmark stock assessment (ASMFC 2015) completed by the ASMFC Black Drum Stock Assessment Subcommittee and Technical Committee, peer reviewed by an independent panel of experts, and approved by the South Atlantic State-Federal Fisheries Management Board for use in management decisions.

The stock assessment could be improved by applying a more complex, data-rich assessment method such as a statistical catch-at-age model. Data limitations that need to be addressed to successfully make this transition are biological sampling (length and age) of recreational and commercial fisheries and a fishery-independent survey to track abundance and age structure of the mature stock. Additionally, information about commercial discards and movement of fish along coast and between water depths would improve the assessment.

V. Status of Research and Monitoring

There are no monitoring or research programs required annually of the states except for the submission of a compliance report. The following fishery-dependent (other than catch and effort data) and fishery-independent monitoring programs were reported in the 2017 reports.

Fishery Dependent Monitoring

- Delaware DFW – Black Drum were sampled from the commercial fishery for total length, weight, sex, and age (2017: 63 fish).
- Maryland DNR – Conducted commercial pound net survey from late spring through summer. (2017: 0 fish).
- Virginia MRC –
    - Conducted a biological monitoring program to sample commercial and recreational harvest (2017 – commercial: 76 samples for length and weight, 45 for sex and age; recreational: 37 samples for length, 9 for weight, 36 for sex, and 34 for age).
    - Conducted Virginia Game Fish Tagging Program with volunteer anglers (2017: 115 fish tagged and 8 recaptured).
- North Carolina DMF – Conducted commercial sampling of black drum bycatch (2017: n=549; mean total length=18 in).
- South Carolina DNR – Terminated the state finfish survey and took over MRIP intercept sampling in 2013 (information reported through MRIP). Commercially reported black drum are captured through commercial monitoring program.
- Georgia CRD – Collected age, length, and sex data through the Marine Sportfish Carcass Recovery Project (2017: 100 black drum, mean length 416 mm centerline length).
- Florida FWC – Conducted Florida trip ticket program monitoring commercial catch and effort. Numbers of fish per trip in 2017 decreased from 2016, but were above the long-term average of the time series (1986-2017).
- NMFS – Collected recreational catch, harvest, release, and effort data, as well as length measurements via MRIP.

Fishery Independent Monitoring

- New Jersey DEP –
    - Ocean Trawl Survey: 30-year time series average is 0.16 (2017: 0.14).
    - Delaware Bay Trawl: 27-year time series average is 0.16 (2017: 0.31)
    - Delaware River Seine: 38-year time series average is 0.07 (2017: 0.23).
- Delaware DFW – Conducted two finfish trawl surveys (16ft for juveniles; 30ft for adults). Older than young-of-year (YOY) black drum are rarely captured, and no long term trend is evident.
- Maryland DNR – Conducted the Coastal Bays Fisheries Seine Survey in Maryland's coastal bay and generally catches juvenile fish. Annual mean catch per haul exhibits no trend and high variation. Annual mean catch per haul in 2017 was near the time series mean and increased for the second year following a low 2015 value.
- North Carolina DMF – Conducted a gill net survey in Pamlico Sound to characterize size and age distribution, and to produce an abundance index (2017: CPUE=1.17, above the time series average of 1.01).
- South Carolina DNR – Conducted an estuarine trammel net survey for subadult abundance (2017: CPUE=0.199, decrease from 2016).
- Georgia CRD –

  - Conducted an estuarine trammel net survey for subadult biological data and abundance index (2017 – Altamaha: n=22, CPUE=0.22; Wassaw: n=14, CPUE=0.09).
  - Conducted an estuarine gill net survey for YOY biological data and abundance index (2017 – Altamaha: n=11, CPUE=0.06; Wassaw: n=1, CPUE=0.01).
- Florida FWC-FWRI – Conducted two seine surveys monthly in northeast and central southeast Florida to develop annual estimates of adult relative abundance. Declining trend is seen in the northeast, while the southeast exhibits an increasing trend.

VI. Status of Management Measures and Issues

Fishery Management Plan
The Black Drum FMP requires all states with a declared interest in the species to have established a maximum possession limit and minimum size limit of at least 12 inches by January 1, 2014, and to have increased the minimum size limit to no less than 14 inches by January 1, 2016.

De Minimis
The black drum FMP allows states to request *de minimis* status if, for the preceding three years for which data are available, their average combined commercial and recreational landings (by weight) constitute less than 1% of the average coastwide commercial and recreational landings for the same three-year period. A state that qualifies for *de minimis* will qualify for exemption in both their commercial and recreational fisheries.

De Minimis Requests
No state requested *de minimis* status through the annual reporting process.

VII. Implementation of FMP Compliance Requirements for 2014 and 2015

The PRT finds that all states have implemented the requirements of the Fishery Management Plan.

VIII. Recommendations of the Plan Review Team

<u>Management and Regulatory Recommendations</u> (H) =High, (M) =Medium, (L) =Low

- Develop management mechanism (e.g., traffic light analysis) to evaluate annual fishery independent and dependent indices to assess stock status and recommend management action if needed. (H)

<u>Prioritized Research and Monitoring Recommendations</u> (H) =High, (M) =Medium, (L) =Low

Stock Assessment and Population Dynamics

- Update the 2015 stock assessment or conduct a new benchmark stock assessment that includes the recalibrated MRIP recreational harvest estimates based on the new, mail-based FES. (H)
- Age otoliths that have been collected and archived. (H)

- Collect information to characterize the size composition of fish discarded in recreational fisheries. (H)
- Collect information on the magnitude and sizes of commercial discards. Obtain better estimates of black drum bycatch in other fisheries, especially juvenile fish in south Atlantic states. (H)
- Increase biological sampling in commercial fisheries to better characterize the size and age composition of commercial fisheries by state and gear. (H)
- Increase biological sampling in recreational fisheries to better characterize the size and age composition by state and wave. (H)
- Obtain estimates of selectivity-at-age for commercial fisheries by gear, recreational harvest, and recreational discards. (H)
- Continue all current fishery-independent surveys and collect biological samples for black drum on all surveys. (H)
- Develop fishery-independent adult surveys. Consider long line and purse seine surveys. (H)
- Collect age samples, especially in states where maximum size regulations preclude the collection of adequate adult ages. (H)
- Conduct a high reward tagging program to obtain improved return rate estimates. Continue and expand current tagging programs to obtain mortality and growth information and movement at size data. (H)
- Conduct tagging studies using implanted radio tracking tags that are compatible with coastal tracking arrays along the Atlantic coast in order to track movement and migration of adults. (H)
- Conduct studies to estimate catch and release mortality rates in recreational fisheries. (H)
- Conduct reproductive studies, including: age and size-specific fecundity, spawning frequency, spawning behaviors by region, and movement and site fidelity of spawning adults. (H)
- Improve sampling of night time fisheries. (M)
- 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. (M)
- Obtain better estimates of harvest from the black drum recreational fishery, especially in states with short seasons. (M)

IX. References

ASMFC. 2013. Interstate Fishery Management Plan for Black Drum. Arlington, VA.

ASMFC. 2015. Black Drum Stock Assessment for Peer Review. Atlantic States Marine Fisheries Commission, Stock Assessment Report. 352 p.

ASMFC. 2018. Addendum I to the Black Drum Interstate Fishery Management Plan. Arlington, VA.

Dick, E.J. and MacCall, A.D. 2011. Depletion-Based Stock Reduction Analysis: A catch-based method for determining sustainable yields for data-poor fish stocks. Fisheries Research, 110: 331-341

MacCall, A.D. 2009. Depletion-Corrected Average Catch: a simple formula for estimating sustainable yields in data-poor situations. ICES Journal of Marine Science, 66: 2267-2271.

X. Figures

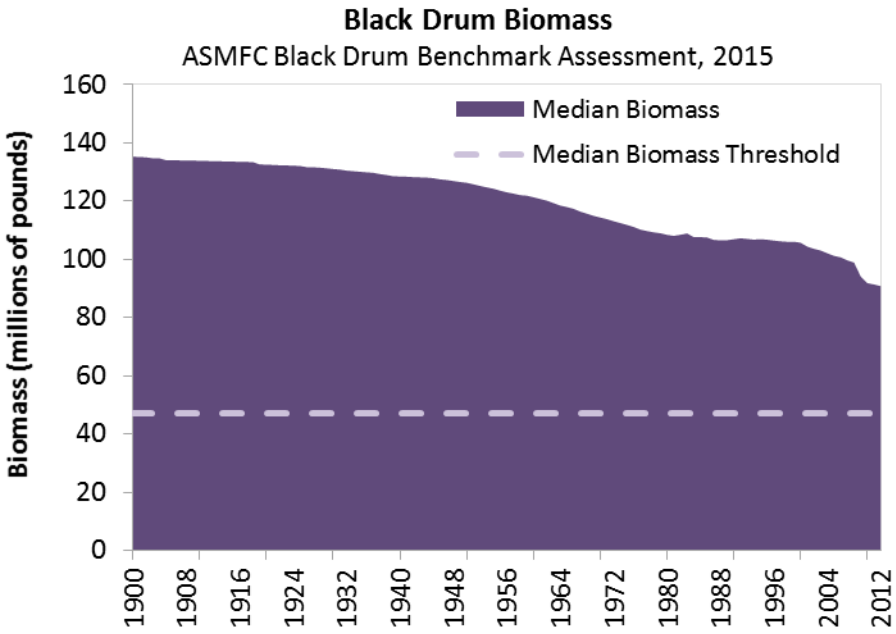

Figure 1. DB-SRA estimates of Median biomass and threshold 1900-2012 (Source: ASMFC 2015).

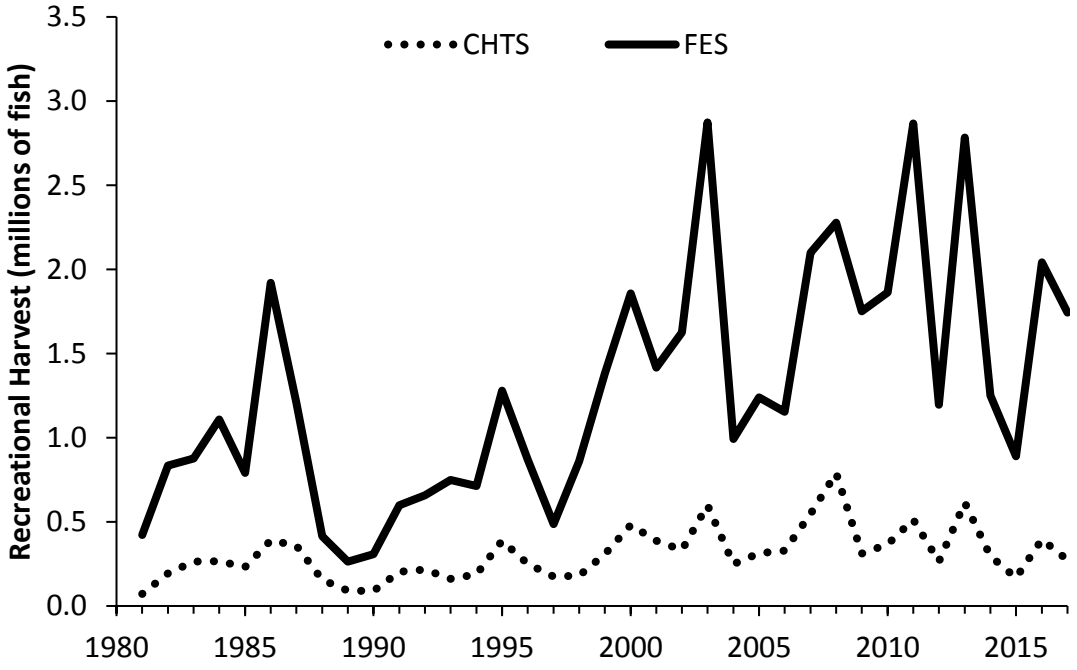

Figure 2. Recreational harvest estimated using the Coastal Household Telephone Survey (CHTS) and the mail-based Fishing Effort Survey (FES). (Source: personal communication with NOAA Fisheries, Fisheries Statistics Division. [10/06/2018])

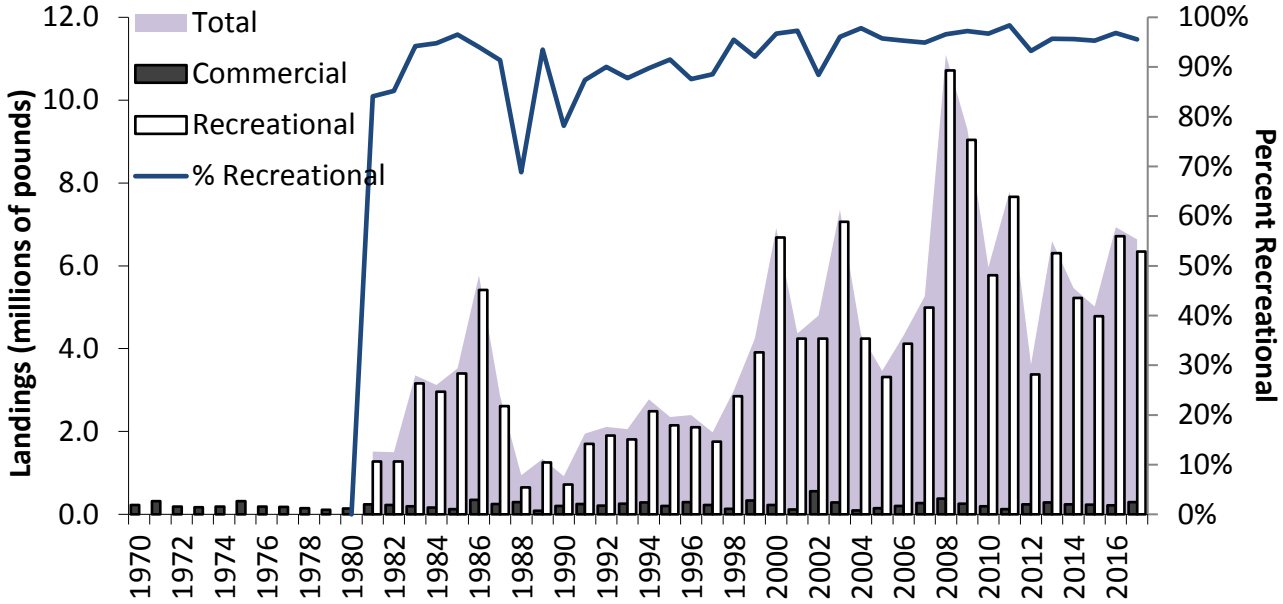

Figure 3. Commercial and recreational landings (pounds) of black drum. Recreational data not available prior to 1981. See Tables 2 and 3 for values and data sources.

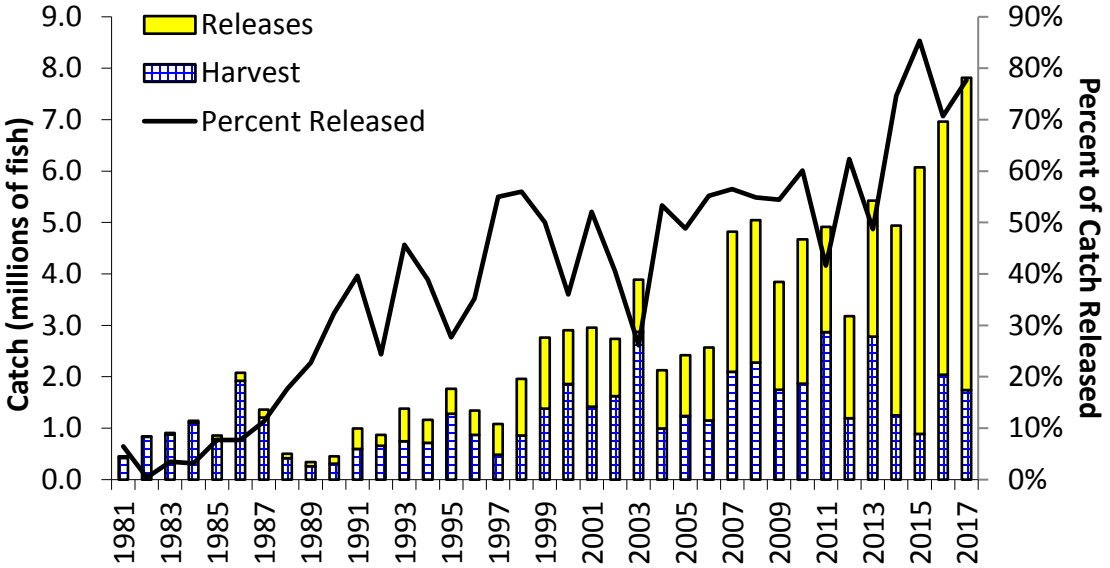

Figure 4. Recreational catch (harvest and alive releases) of black drum (numbers) and the proportion of catch that is released. See Tables 4 and 5 for values and data sources.

XI. Tables

Table 1. Black drum regulations for 2017. The states of New Jersey through Florida are required to meet the requirements in the FMP. All size limits are total length.

State	Recreational		Commercial			Notes
	Size limit	Bag limit	Size limit	Trip Limit	Annual Quota	
ME - NY	-	-	-	-	-	
NJ	16” min	3/person/day	16” min	10,000 lbs	65,000 lbs	
DE	16” min	3/person/day	16” min	10,000 lbs	65,000 lbs	
MD	16” min	1/person/day 6/vessel (Bay)	16” min		1,500 lbs Atlantic Coast	Chesapeake Bay closed to commercial harvest. May reopen in the future due to Addendum I.
VA	16” min	1/person/ day	16” min	1/person/ day*	120,000 lbs	*without Black Drum Harvesting and Selling Permit
NC	14” min - 25” max; 1 fish > 25” may be retained	10/person/ day	14” min - 25” max	500 lbs		
SC	14” min - 27” max	5/person/day	14” min - 27” max	5/person/day		Commercial fishery primarily bycatch
GA	14” min	15/person/ day	14” min	15/person/ day		
FL	14” min - 24” max; 1 fish >24” may be retained	5/person/day	14” min - 24” max	500 lbs/day		

Table 2. Commercial landings (pounds) of black drum by state, 2003-2017. (Sources: 2018 state compliance reports for 2017 fishing year; for years prior to 2017, personal communication with ACCSP, Arlington, VA [10/06/2018])

Year	NJ	DE	MD	VA	NC	SC	GA	FL	Total
2003	12,624	1,686	904	113,858	148,785		*	9,511	287,368
2004	15,708	4,200	1,082	*	62,445		*	12,653	96,088
2005	1,970	*	270	95,233	44,989		*	5,249	147,710
2006	19,657	*	2,319	52,322	125,214		*	3,998	203,510
2007	1,518	37,711	318	67,730	148,231		*	12,770	268,279
2008	1,487	9,724	*	44,040	301,998	*	*	19,348	376,597
2009	6,408	30,563	198	57,249	148,994		*	15,710	259,122
2010	3,079	49,744	*	58,150	69,194		*	15,684	195,851
2011	3,130	*	*	44,620	56,083		*	22,295	126,128
2012	19,017	10,943	571	104,237	94,352	*		14,302	243,422
2013	16,251	24,640	2,145	87,235	127,170	*	*	28,460	285,901
2014	9,270	*	*	88,402	51,217			91,587	240,476
2015	6,478	39,282	*	86,947	51,073			50,477	234,257
2016	2,210	49,109	*	49,859	89,886	*		26,978	218,042
2017	21,248	3,800	510	44,579	182,979	*	0	41,280	294,396

* Indicates confidential landings.

Table 3. Recreational harvest (pounds) of black drum by state, 2003-2017. Values shown are mail-based Fishing Effort Survey (FES)-calibrated estimates. (Sources: 2018 state compliance reports for 2017 fishing year; for years prior to 2017, personal communication with NOAA Fisheries, Fisheries Statistics Division. [10/06/2018])

Year	NJ	DE	MD	VA	NC	SC	GA	FL	Total
2003	553,944	0	70,067	108,859	1,926,671	608,714	277,998	3,517,231	7,063,484
2004	1,086,448	12,888	7,011	25,189	566,484	73,179	207,176	2,264,948	4,243,323
2005	410,302	8,254	0	63,400	509,328	157,399	107,037	2,060,267	3,315,987
2006	1,280,815	70,267	17,936	14,214	431,212	202,124	100,233	1,998,802	4,115,603
2007	446,699	51,069	0	494,671	697,822	212,103	174,273	2,918,399	4,995,036
2008	4,162,735	52,291		885,718	1,232,589	164,007	461,085	3,757,877	10,716,302
2009	2,950,869	39,864		1,704,514	421,788	103,384	83,749	3,739,378	9,043,546
2010	350,673	172,861	105,096	49,732	812,699	203,796	364,352	3,712,810	5,772,019
2011	373,639	38,043	0	1,243,692	823,423	89,482	56,361	5,043,573	7,668,213
2012	37,076	2,844	0	36,195	879,401	321,734	211,618	1,885,164	3,374,032
2013	94,636	15,668	0	112,139	2,709,269	413,455	149,094	2,813,673	6,307,934
2014	11,476	22,070	18,684	97,043	230,834	238,616	249,118	4,353,686	5,221,527
2015	443,907	16,992	16,575	25,216	780,876	82,484	88,698	3,325,410	4,780,158
2016	159,589	2,180	8,924	77,672	1,322,547	623,449	226,558	4,292,398	6,713,317
2017	406,068	22,998	3,001	81,275	856,081	681,976	187,698	4,105,686	6,344,783

Table 4. Recreational harvest (numbers) of black drum by state, 2003-2017. Values shown are mail-based Fishing Effort Survey (FES)-calibrated estimates. (Sources: 2018 state compliance reports for 2017 fishing year; for years prior to 2017, personal communication with NOAA Fisheries, Fisheries Statistics Division. [10/06/2018])

Year	NJ	DE	MD	VA	NC	SC	GA	FL	Total
2003	33,273	0	2,747	16,977	1,265,995	613,785	76,186	863,997	2,872,960
2004	20,450	1,280	1,450	4,044	296,531	71,386	61,295	536,462	992,898
2005	21,427	2,413	0	8,929	465,076	278,081	37,150	425,765	1,238,841
2006	64,963	37,951	512	1,192	276,257	272,995	54,937	444,474	1,153,281
2007	42,198	8,659	0	45,672	876,178	239,939	98,878	787,403	2,098,927
2008	117,112	20,731		71,301	925,963	97,143	168,499	877,090	2,277,839
2009	69,140	1,112		41,986	449,901	45,752	41,853	1,100,618	1,750,362
2010	13,421	3,609	6,556	4,846	650,010	85,152	138,328	961,627	1,863,549
2011	22,882	1,196	0	126,964	1,259,216	29,909	25,803	1,401,636	2,867,606
2012	1,368	110	0	7,555	556,482	91,318	42,826	496,537	1,196,196
2013	11,083	1,851	0	6,170	1,511,995	143,662	64,533	1,044,490	2,783,784
2014	482	1,052	1,690	10,676	109,307	96,967	47,807	983,582	1,251,563
2015	10,793	462	1,091	1,600	276,126	37,186	48,229	514,606	890,093
2016	6,008	138	250	5,807	459,078	256,158	96,351	1,217,913	2,041,703
2017	18,435	1,214	828	16,700	355,544	241,832	64,240	1,044,752	1,743,545

Table 5. Recreational alive releases (numbers) of black drum by state, 2003-2017. Values shown are mail-based Fishing Effort Survey (FES)-calibrated estimates. (Sources: 2018 state compliance reports for 2017 fishing year; for years prior to 2017, personal communication with NOAA Fisheries, Fisheries Statistics Division. [10/06/2018])

Year	NJ	DE	MD	VA	NC	SC	GA	FL	Total
2003	1,840	8,485	0	40,373	481,742	6,116	80,472	397,726	1,016,754
2004	0	1,658	0	27,311	255,753	37,006	56,382	757,438	1,135,548
2005	61,287	28,305	4,451	33,250	376,363	77,959	33,031	569,203	1,183,849
2006	44,606	3,275	0	202,749	265,369	76,481	83,715	742,521	1,418,716
2007	63,726	7,921	275	75,767	832,132	96,356	90,422	1,556,818	2,723,417
2008	370,945	21,115		14,161	548,931	273,001	132,787	1,409,845	2,770,785
2009	316,471	2,310		41,215	411,358	81,423	60,290	1,180,223	2,093,290
2010	47,508	4,251	9,613	64,320	427,577	66,635	72,870	2,113,308	2,806,082
2011	4,799	4	9,595	319,622	711,755	66,748	20,355	913,567	2,046,445
2012	17,092	1,653	89,193	22,236	397,155	153,799	52,722	1,246,585	1,980,435
2013	0	57,091	15,868	52,417	497,334	330,528	35,034	1,654,129	2,642,401
2014	37,364	11,243	0	269,648	1,964,749	335,600	21,581	1,047,833	3,688,018
2015	545,613	17,109	25,115	164,322	1,791,758	1,483,956	55,773	1,096,185	5,179,831
2016	9,399	361	114	46,494	2,530,596	1,268,667	54,266	1,012,670	4,922,567
2017	111,739	3,689	2,809	137,987	2,336,352	692,616	85,365	1,648,030	6,069,924