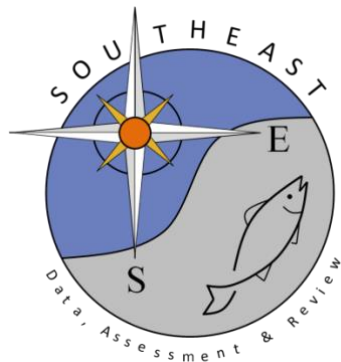


Calculated discards of King Mackerel from commercial fishing vessels in the Gulf of Mexico, South Atlantic, and the Mixing Zone

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2019 SEDAR38-WP-01

10 February 2020



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Please cite this document as:

Kevin McCarthy and Jose Diaz. 2020. Calculated discards of King Mackerel from commercial fishing vessels in the Gulf of Mexico, South Atlantic, and the Mixing Zone. 2019-S38Update-WP-01. SEDAR, North Charleston, SC. 4 pp.

Calculated discards of King Mackerel from commercial fishing vessels in the Gulf of Mexico, South Atlantic, and the Mixing Zone

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Introduction

In August 2001, the Southeast Fisheries Science Center (SEFSC) initiated a program to collect commercial fishing vessel discard data from Gulf of Mexico and South Atlantic fisheries. A reporting form was developed that supplements the existing vessel coastal logbook forms that are currently mandatory for those fisheries (Poffenberger and McCarthy, 2004). As part of the data provided for the Southeast Data Assessment and Review (SEDAR) Data Workshop for Gulf of Mexico and South Atlantic King Mackerel, discard data from the SEFSC coastal fisheries logbook program were used to calculate the number of King Mackerel that were discarded during the period January 1, 2002 through December 31, 2018.

Data collection for the discard logbook program involves, each year, a 20% random sample of the vessels with South Atlantic snapper-grouper, Gulf of Mexico reef-fish, King Mackerel, Spanish mackerel or shark permits selected to report the number of animals discarded by species. To assure that the sample was representative of vessels with these Federal permits, the universe of permitted vessels was stratified by region and gear fished. A random sample was selected, without replacement, from each stratum. Region was defined as the Gulf of Mexico (Gulf-side of the Florida Keys-Dry Tortugas to the Texas-Mexican border) and the South Atlantic (which extends from the North Carolina - Virginia border to the ocean-side of the Florida Keys- Dry Tortugas). Fishing gear strata included handline, electric and hydraulic reels (bandit rig), trolling, longline, trap, gillnet, and diving. The selected fishers were instructed to complete a supplemental discard form for every fishing trip that they made. Trips with no discards were reported as such.

Reported data included the numbers of discards by species, estimated condition of the fish when released, reason for release (due to regulations or unmarketable/unwanted), and the fishing area where the animal was discarded. There are six options for the condition of released fish: all animals are dead, majority of the animals are dead, all animals are alive when released, majority of animals are alive, the fish are kept but not sold, and the condition of the animals is unknown. To calculate species specific discard rates, discard data were matched to the landings and effort data reported (for the appropriate trip) to the coastal logbook program.

Methods

The data set for this analysis included information from trips by vessels that reported discards between January 1, 2002 and December 31, 2018 in the US South Atlantic, Gulf of Mexico, and King Mackerel Mixing Zone. The Gulf of Mexico included all areas from southwest Florida to Mexico (areas 1-21, Figure 1). The South Atlantic was defined as the area north of 25° N to 37° N. The “Mixing Zone” was defined as the area south of 25° N to 23° N in the South Atlantic and excluded those areas previously defined as in the Gulf of Mexico. Data from the Mixing Zone was combined with South Atlantic data for the months April-October. The Mixing Zone was treated as a separate region during the months November-March.

The objective of this analysis was to calculate the numbers of King Mackerel discarded by commercial vessels that fished for species other than shrimp or other shellfish. Fishing activity for these analyses included only hook and line gear (handlines, electric and hydraulic reels, and trolling). Reports of King Mackerel discards were made for 27 trips by vessels fishing other gears (longlines, gillnets, and traps) in the Gulf of Mexico. In the South Atlantic, 32 trips by vessels fishing gears other than hook and line gear were reported. In the Mixing Zone, no King Mackerel were reported as discards from vessels fishing gear other than hook and line. The available data for gears other than hook and line were too few for discards to be calculated.

Complete years of discard logbook data were available for the period 2002-2018. Total effort data for the fishery were available for the years 1998-2018, however. Prior to 1998, fisher reporting of mackerel landings and effort was not required. Due to the likely partial reporting of mackerel effort, the time series for calculating King Mackerel discards included the years 1998-2018.

Data filtering and stratification followed the methods used in SEDARs 38 and 16 (McCarthy, 2008). Data were stratified by gear (vertical line and trolling) and number of hooks per line (1 hook, 2 or more hooks) in the Gulf of Mexico; by number of lines fished and number of hooks per line in the Mixing Zone; and by vessel length and number of hooks per line in the South Atlantic. Discard rates within each stratum were calculated across all years (2002-2018) combined. Fishing effort was summed within each year/stratum combination. Discards were calculated as:

$$\text{Total discards within a year/stratum} = \text{stratum specific discard rate} * \text{stratum specific fishing effort per year}$$

Regional total discards for a year were calculated as the sum total discards across all strata within a year and region.

Results and Discussion

During the years 2002-2018, discard forms were submitted for 41,571 Gulf of Mexico trips, 11,257 Mixing Zone trips, and 112,093 South Atlantic trips. Of those trips, discards were reported on 58.4% of Gulf of Mexico trips, 36.5% of Mixing Zone trips, and 28.4% of South Atlantic trips. Discards of King Mackerel were reported on 1,129 Gulf of Mexico trips (2.7% of trips), 120 Mixing Zone trips (1.1%), and 4,342 South Atlantic trips (3.9%). By way of comparison, there were 285,994 Gulf of Mexico, 67,102 Mixing Zone, and 668,227 South Atlantic trips reported to the coastal logbook program during 2002-2018. King Mackerel landings were reported for 45,342 Gulf of Mexico (15.9%), 10,551 Mixing Zone (15.7%), and 253,551 South Atlantic (37.9%) trips.

Calculated total discards for each region by year are provided in Table 1 for commercial fishing trips deploying hook and line gear. Prior to 1998, reports of King Mackerel fishing effort and landings reported to the coastal logbook program are incomplete because no reporting requirement was in place. King Mackerel discards cannot be reliably calculated for the years prior to 1998 due to that partial reporting.

Across all years and regions, approximately 18.4% of reported King Mackerel discards were classified as “all dead”, “majority dead”, or “kept”. More than 78% of King Mackerel discards were reported as “all alive” or “majority alive”. The release condition of the remaining discard (3.2%) were either not reported or the disposition was unknown.

The reason “due to regulatory restrictions” accounted for more than 90% of reported King Mackerel discards over all regions. Market conditions were reported as the reason for discarding King Mackerel in 1.8% of cases and an additional 7.7% of cases reported that the fish were kept for bait or eaten onboard the vessel or the reason for discarding was unreported.

The number of trips reporting King Mackerel discards in the US South Atlantic and Gulf of Mexico was very low. Only 3.9% of trips reporting discards had King Mackerel discards in the South Atlantic while only 2.7% of trips reporting to the discard logbook program reported King Mackerel discards in the Gulf of Mexico. The lowest percentage of trips with King Mackerel discards reported occurred in the Mixing Zone (1.1%). Methods used in prosecuting the King Mackerel fishery may limit the number of discards from the fishery. In addition, King Mackerel appear to have been an uncommon bycatch in other fisheries.

Literature Cited

- McCarthy, K.J., 2008. Calculated discards of king mackerel from commercial fishing vessels in the Gulf of Mexico, South Atlantic, and the Mixing Zone. SEDAR16-DW-23. Fisheries Division Contribution SFD-2008-003.
- Poffenberger, J. and K. McCarthy. 2004. Estimates of red snapper discards by vessels with Federal permits in the Gulf of Mexico. SEDAR 7-DW-22.

Table 1. Calculated yearly (calendar year) total discards of King Mackerel from hook and line gear vessels for each region. Discards are reported as number of fish.

Year	Gulf of Mexico Total Discards	South Atlantic Total Discards	Mixing Zone Total Discards
1998	22,097	36,675	338
1999	26,725	31,817	408
2000	21,859	32,364	346
2001	21,091	33,307	323
2002	20,196	29,186	361
2003	20,385	30,144	316
2004	17,971	25,174	259
2005	15,487	23,692	264
2006	17,995	27,435	212
2007	16,092	30,974	204
2008	14,973	32,480	171
2009	15,772	36,081	177
2010	10,567	30,201	185
2011	13,139	27,518	196
2012	14,897	26,344	210
2013	13,305	26,410	168
2014	15,087	29,981	159
2015	14,195	28,468	171
2016	15,230	30,860	194
2017	14,873	31,125	241
2018	13,028	27,531	179

Figure 1. Coastal Logbook defined fishing areas.