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Commercial Landings of Gulf of Mexico Yellowedge Grouper (*Hyporthodus flavolimbatus*)

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Introduction

Commercial landings statistics are the quantities and value of seafood products caught by fishermen in the U.S. and sold to established (licensed) wholesale and retail seafood dealers. These data have been collected as early as the late 1890s. Currently, these data are collected by trip ticket programs (TTPs) managed by state agencies. In addition to the quantity and value, basic information on the gear used to catch the fish, the area where the fishing occurred and the county and state where the catch was landed are recorded (Gloeckner, 2014).

Commercial landings of Yellowedge Grouper for the Gulf of Mexico (hereafter referred to as the Gulf) are provided in gutted weight (in pounds) for the period 1975-2021.

Methods

Commercial landings for Gulf Yellowedge Grouper were compiled using several data sources. Most of the data were accessed from an Oracle database housed at the Southeast Fisheries Science Center (SEFSC) in Miami, Florida.

Data Sources

The Accumulated Landings System (ALS) is an Oracle database maintained by SEFSC. This database contains landings data from 1926 to present with data prior to 1962 considered historical. Historical landings are summarized annually. Beginning in 1977, landings were consistently provided as monthly summaries, while a few states for some species began reporting monthly in 1972. For more information on data collection of landings prior to the implementation of a state TTP (Trip Ticket Program) and ALS database structure, refer to Gloeckner (2014).

Data from state TTPs begin in various years, depending on the state (Donaldson, 2004). In the Gulf of Mexico, trip ticket data were available through the Gulf of Mexico Fisheries Information Network (GulfFIN) housed at the Gulf States Marine Fisheries Commission (GSMFC). Where data were available from state trip ticket programs, those data were used in lieu of data from ALS.

The Florida General Canvass dataset, within the ALS database, contains annual landings 1976-1996. These data were submitted by federal port agents responsible for a particular county within Florida (Gloeckner, 2014). The General Canvass data provides estimated proportions of the landings by gear and area.

Stock Boundary

Commercial landings for Gulf of Mexico Yellowedge Grouper were compiled from Texas through West Florida. This boundary follows the Gulf of Mexico Fisheries Management Council (GMFMC) boundary which is a line from Riley's Hump, the Tortugas and US 1, where the North of US1 is assigned to the GMFMC and South of US 1 is assigned to the South Atlantic FMC region. Additionally, in order to replicate the methods from SEDAR 22 the Gulf of Mexico was initially divided into three subregions: East (1 – 5), Central (6 -12), and West (13 -21). All analyses were done based on the three subregion model, after which landings were aggregated

into two subregions for SEDAR 85 with the eastern Gulf consisting of fishing areas 1-12 and the western Gulf defined as fishing areas 13-21 (Figure 1).

Gear Groups

In the previous assessment (SEDAR 22), commercial landings were summarized into two main gears (vertical/hand line and longline). For SEDAR 85, commercial landings were separated into three main gears (vertical line, longline, and other). Table 1 highlights the NMFS and FIN gear codes associated with each gear group. SEDAR 22 only included vertical line and longline landings, landings from other gears were excluded. For confidentiality purposes and consistent with more recent grouper SEDAR assessments, other gears were aggregated with vertical line landings for this assessment so no landings were excluded, regardless of how minor they were (SEDAR 85).

Data Compilation

The SEFSC maintained materialized view in ORACLE appropriately joins all data sources based on best practices (referred to as MV landings). All data housed within ALS are in the NMFS coding system, whereas TTP data are provided in the Fisheries Information Network (FIN) standard. All gear, area, county, state, and species information are translated to the common FIN coding standard. The following data were used for each respective state:

Texas

- ALS from 1975-2013
- Trip ticket from 2014-2021

Louisiana

- ALS from 1975-1999
- Trip ticket from 2000-2021

Mississippi

- ALS from 1975-2013
- Trip ticket from 2014-2021

Alabama

- ALS from 1975-2001
- Trip ticket from 2002-2021

Florida

- ALS from 1975-1984
- Trip ticket from 1985-2021
- General Canvass to proportion landings by gear and area from 1977-1996

The Florida General Canvass data contain annual landings totals by county on a percentage basis to create the estimated proportions of catch by the gear and area (Gloeckner, 2014). These proportions are applied to ALS landings for Florida from 1977-1984 to estimate landings by gear and area. From 1985-1996, when gear or area information are missing from the trip ticket, General Canvass data are used to impute gear and area. This standard method of using General Canvass data for Florida data from 1977-1996 was implemented in MV landings across all species.

Area fished, county landed, and state landed are used to filter the data to the stock boundary (Figure 1). With just county or state landed information, one cannot assume landings are a part of Gulf of Mexico, South Atlantic, or foreign catch (Gloeckner, 2014). Therefore, area of capture is preferred when assigning catch to the appropriate region. However, when area information is missing, then the recorded county and/or state landed is used to assign landings to the Gulf of Mexico to account for these removals from the stock biomass. When area information is missing, Monroe County, Florida is considered as part of the Gulf of Mexico landings.

In order to attribute all Yellowedge Grouper landings to a gear group and fishing area, annual landings proportions were used to assign gear and area. This method was applied to all states with the exception of Texas from 1978-1983. In 1978 and 1979 gear information is missing for the entire year. Therefore, gear proportions by area were calculated as an average from 1973-1977. Additionally from 1980-1983, the only gear reported by Texas for groupers is trawl gear. These landings are assumed to be non-trawl, meaning an average from 1984-1988 was used to proportion 1980-1983 Texas landings by gear and area. This method is consistent with SEDAR 22.

Coastal Logbook Proportioning to Assign Gear and Area to the Landings

For landings reported during 1990 and after, gear and area information from the SEFSC Coastal Fisheries Logbook Program (CFLP) were used to assign gear and area to the landings. This decision was based on the general acceptance that records regarding gear(s) used and area(s) fished were probably more accurately reported on the fishermen's coastal logbook, which are completed by the fishing boat captains or designees rather than on the dealer reported trip tickets, often reported online by secretarial staff. For a general description of the logbook data please review Atkinson et al. (2021) and Poffenberger (2003).

This method involves calculating the proportion of logbook landings by year, state, gear (e.g., vertical line, longline, and other) and fishing area. These proportions are applied to the annual landings by month and state from 1990-2021.

Misidentification and Unclassifed Groupers

Prior to 1986 nearly all groupers except two species, Goliath (*Epinephelus itajara*) and Warsaw (*Hyporthodus nigritus*), were landed as 'grouper' in the Gulf of Mexico. Starting in 1986 grouper landings began to be identified by species and the amount of unclassified groupers declined sharply. According to the SEDAR 22 report, it was noted that Yellowedge Grouper may have been reported as Yellowfin Grouper (*Mycteroperca venenosa*) from the onset of the fishery to about 1990. To address each of these misidentification issues, a proportion of Yellowfin Grouper landings were assigned to Yellowedge Grouper and then a proportion of unclassified groupers were assigned to Yellowedge Grouper with methods differing by the two main gear groups

(longline and vertical line). For other gears, landings were only considered for 1986 to 2021 during the period where groupers are classified to species as they constituted a very small proportion of the landings.

Yellowfin Misidentification

From 1986-1990 when landings were reported at the species level, it is assumed that 7.7% of Yellowfin Grouper are true Yellowfin Grouper, and the other 92.3% are Yellowedge Grouper. This assumption was taken from the SEDAR 22 report. Therefore, 92.3% of the Yellowfin Grouper landings by year, state, gear group and area were assigned to the respective Yellowedge Grouper landings.

Bottom Longline Unclassified Groupers

1979 - 1982

Similar to SEDAR 22, proportions of Yellowedge Grouper to all classified groupers from Prytherch (1983) were applied to unclassified grouper landings in order to assign unclassified grouper landings to Yellowedge Grouper landings from 1979-1982. These proportions were summarized by subregion based on the fishing area where for the base run the Southeastern Gulf (East) is areas 1-5, Northeastern Gulf (Central) is areas 6-12, and Western Gulf (West) is areas 13-21. During SEDAR 22, a sensitivity run was proposed due to the extremely high landings in areas 6 and 7 for 1982, where it was suggested that high landings may be unlikely due to the shallower depths in those fishing areas and Yellowedge Grouper being predominantly a deep water species. It was assumed that those landings were more likely attributable to Red Grouper (*Epinephelus morio*). It was therefore suggested that for the sensitivity run (hereafter "low landings scenario") that area 7 should be assumed to have no Yellowedge Grouper landings during those years, and area 6 was assumed to be similar to the Southeast subregion, rather than the Northeast subregion resulting in the proportion for area 6 being decreased from 0.963 to 0.227. Further detail regarding the sensitivity run of the low-landings vs. base-landings scenarios can be found in the SEDAR 22 report. The proportions by area and scenario (base vs low) used in SEDAR 85 are shown in Table 2.

1983 - 1985

Due to a lack of data on species composition from 1983 – 1985, and expert opinion that the proportions from Prytherch (1983) were likely no longer representative of the fishery, a method of filling in data for 1983 -1985 was needed. To fill in the missing years, the proportion used in 1982 to assign unclassified groupers to Yellowedge and the proportion of Yellowedge Grouper to all classified groupers in 1986 were used in a linear interpolation. The calculated proportions from the linear interpolation were used to assign unclassified grouper landings from 1983-1985 to Yellowedge Grouper and are shown in Table 3. This is a deviation from the SEDAR 22 method where a linear interpolation was calculated on the landings of Yellowedge Grouper between 1982 and 1986. The reported unclassified grouper landings from 1983-1985 are not linear and therefore a linear interpolation of the proportions seemed more appropriate for these years, as it assumes a smooth transition from the species composition in 1982 to that of 1986.

1986 – 2021

For 1986 – 2021 the magnitude of unclassified grouper landings decreased significantly however, it was not zero. As a result, a proportion of unclassified landings for those years needed to be added in to the Yellowedge Grouper landings. Annual proportions of longline Yellowedge Grouper to all classified groupers (excluding Goliath and Warsaw) were calculated for each subregion and used to assign unclassified landings to Yellowedge Grouper (Table 4).

Vertical Line Unclassified Groupers

1975 – 1985

The species composition of groupers (except Warsaw and Goliath) from 1986-1989 was used to assign a proportion of unclassified grouper landings to Yellowedge Grouper from 1975-1985 (Table 5). Warsaw and Goliath Grouper are excluded because they have reported landings prior to 1986 and are therefore unlikely to have been included in unclassified grouper landings. This is a deviation from the SEDAR 22 method which calculated the proportion of all grouper species from 1986-1989. With Warsaw and Goliath Grouper included in the SEDAR 22 method, the proportion of Yellowedge Grouper is much lower compared to SEDAR 85 where those two species are excluded. Additionally, in SEDAR 22 the proportion of unclassified groupers assigned to Yellowedge Grouper was calculated by summing the proportion of Yellowedge grouper and Yellowfin grouper to all classified groupers, which assumes 100% of Yellowfin grouper were Yellowedge Grouper. For SEDAR 85, we first reassigned the proportion of Yellowfin Grouper (92.3%) to Yellowedge Grouper for the years with assumed misidentification (1986 – 1990), and then used those adjusted totals to calculate the proportion of Yellowedge Grouper to all classified groupers.

1986 – 2021

For 1986 – 2021 as above, annual proportions of vertical line Yellowedge Grouper to all classified groupers (excluding Goliath and Warsaw) were calculated for each subregion and used to assign unclassified landings to Yellowedge Grouper (Table 6).

IFQ Program

In 2010, the Gulf of Mexico Fisheries Management Council started a program whereby fishermen own a portion of the annually allocated Deepwater Grouper Complex quota which is also tradeable from one permit holder to another. The Individual Fishing Quota (IFQ) Program is administered by the NOAA Fisheries Southeast Regional Office (SERO). The IFQ landings data does not have gear information which is needed for the assessment process. In order to assure that the landings in the SEFSC Oracle databases are matching what is reported to SERO and which is deemed the most accurate data, Yellowedge Grouper landings are corrected to match the IFQ landings data. Annual IFQ correction factors are calculated from the ratio of the SERO landings to the SEFSC landings and applied to the SEFSC landings from 2010-2021 (Table 7).

Results

Base vs. low landings sensitivity run

In SEDAR 22, a sensitivity run using a “low-landings” scenario was discussed and ultimately submitted along with the base ladings data. During the assessment, it was decided that the base scenario would be used in the model. In SEDAR 85 we have provided landings for both

scenarios, with the difference between the two scenarios shown in Figure 2. Since the last assessment ultimately went forward with the base landings scenario, only those landings will be addressed for the remainder of this report.

Annual landings totals

Annual calculated Yellowedge Grouper landings totals for the base scenario are summarized by subregion (East, West) in Figure 3. Landings peaked in 1982, and have remained relatively stable from 1990 to 2021. Figure 4 shows the annual landings totals for the base scenario summarized by gear group, with the majority of landings coming from the longline fishery starting in the early 1980s. The vertical line fishery was largest between 1975 and 1988, after which there was a precipitous drop-off in vertical line landings. Other gears were combined with vertical line gear as they made up a very small proportion of total landings. For all regions and years combined, landings from "other" gears make up about 0.16% of the combined vertical line and "other" landings. The annual landings by gear and subregion for the base scenario are presented in Table 8.

Changes from SEDAR 22

Bottom longline

- For 1983 – 1985 there was no information on the proportion of unclassified groupers that should be considered Yellowedge Grouper, as a result, in SEDAR 22 a linear interpolation was done using the calculated total landings by subregion for bottom longline in 1982 and the reported total landings for bottom longline in 1986. For SEDAR 85, this decision was revisited, as it was deemed unreasonable to assume the landings changed linearly from one year to the next, especially considering the unclassified landings did not show a linear trend. Instead, a linear interpolation of the proportion of Yellowedge Grouper to all other groupers in 1982 and 1986 was used. This resulted in landings that fluctuate as may be expected based on unclassified landings fluctuations.

- The methodology for calculating the proportion of Yellowedge Grouper to all classified groupers to apportion unclassified grouper landings from 1986 onward changed from SEDAR 22 to SEDAR 85. In SEDAR 22 Warsaw and Goliath Grouper were included in the classified grouper totals – however, those species had already been reported to species for several years prior to the beginning of the Yellowedge Grouper fishery, meaning the likelihood of Warsaw or Goliath Grouper being lumped in as unclassified groupers was very low. Including Warsaw and Goliath Grouper in the classified grouper total results in Yellowedge Grouper proportions that are biased low. In SEDAR 85 the percent Yellowedge Grouper to all classified groupers was calculated without including those two species, resulting in higher proportions of unclassified landings being assigned to Yellowedge Grouper, and therefore higher landings in years with significant unclassified grouper landings.

A comparison of bottom longline landings between SEDAR 22 and SEDAR 85 is shown in Figure 5. For longline landings in the west, the difference between each SEDAR is less than 6% for each of the three analysis time periods (1979 – 1985, 1986 – 1990, 1991 – 2009). For longline landings in the east, the period of 1979 – 1985 is 19.65% less for SEDAR 85 compared to SEDAR 22, which can be attributed to the change in the interpolation methodology for 1983 –

1985 landings. For 1986 – 1990, longline landings in the east were 26.08% higher in SEDAR 85 compared to SEDAR 22 which can be attributed to differences in proportioning of unclassified groups detailed above. For 1991 – 2009 the difference was less than 5%.

Vertical line

- In SEDAR 22, other gear was excluded entirely, in SEDAR 85 landings for "other" gears have been added in with vertical line.

- The methodology for calculating the percent of Yellowedge Grouper relative to all classified groupers to assign unclassified grouper landings from 1975 – 1985 changed from SEDAR 22 to SEDAR 85 in two main ways:
    - In SEDAR 22, the proportion of Yellowedge Grouper was calculated as a percent of classified groupers belonging to Yellowedge Grouper and Yellowfin Groupers from 1986 – 1989 (under the assumption that most reported Yellowfin Grouper landings were actually Yellowedge Grouper). For SEDAR85, a proportion of Yellowfin Grouper was first reassigned to Yellowedge Grouper, and then the percent of Yellowedge Grouper to all classified groupers was used. This deviation was agreed upon due to the fact that not 100% of the Yellowfin Grouper were actually Yellowedge, which would result in inflated percentages of unclassified groupers being assigned to Yellowedge Grouper.
    - The second difference comes from the species selected to calculate the percent of Yellowedge Grouper out of all classified groupers: as mentioned above, in SEDAR 22 Warsaw and Goliath Grouper were included in the classified grouper totals, while in SEDAR 82 those two species were excluded from classified grouper totals.
- The methodology for calculating the percent of Yellowedge Grouper relative to all classified groupers to assign unclassified grouper landings for 1986 onward differed as above, with Goliath and Warsaw Grouper being excluded from the classified grouper totals, resulting in more unclassified grouper landings being assigned to Yellowedge Grouper.

A comparison of vertical line landings for SEDAR 22 to SEDAR 85 is shown in Figure 6. As a result of the difference in calculating a proportion of Yellowedge Grouper to all classified groupers, vertical line west landings in all three analysis time periods (1975-1985, 1986-1990, and 1991-2009) have 36-44% more landings for SEDAR 85 compared to SEDAR 22. This is because by excluding Warsaw and Goliath Grouper in the calculation, a higher proportion is attributed to Yellowedge Grouper in the west. Vertical line landings in the east for 1975-1985 has a 1% difference. Vertical line landings in the east from 1986-2009 show 20% less landings for SEDAR 85 compared to SEDAR 22. This unexplained discrepancy is likely attributed to uncertainty in the proportions used for SEDAR 22 when assigning a proportion of unclassified grouper landings from 1986-2009 to Yellowedge Grouper.

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Tables

Table 1: Gears observed in the Yellowedge Grouper (*Hyporthodus flavolimbatus*), Yellowfin Grouper (*Mycteroperca venenosa*), and Unclassified Groupers datasets, and their respective gear groupings used to aggregate the data.

FIN Gear Code	Gear Name	SEDAR Gear Group
400	LONG LINES	LONG LINES
402	LONG LINES, SURFACE	LONG LINES
403	LONG LINES, BOTTOM	LONG LINES
404	LONG LINES, SURFACE, MIDWATER	LONG LINES
405	LONG LINES, TROT	LONG LINES
408	BUOY GEAR	LONG LINES
300	HOOK AND LINE	VERTICAL LINE
301	HOOK AND LINE, MANUAL	VERTICAL LINE
302	HOOK AND LINE, ELECTRIC	VERTICAL LINE
303	ELECTRIC/HYDRAULIC, BANDIT REELS	VERTICAL LINE
320	TROLL LINES	VERTICAL LINE
324	TROLL LINE, GREEN-STICK	VERTICAL LINE
700	HAND LINE	VERTICAL LINE
010	HAUL SEINES	OTHER
092	OTTER TRAWL BOTTOM, FISH	OTHER
095	OTTER TRAWL BOTTOM, SHRIMP	OTHER
110	OTHER TRAWLS	OTHER
116	TRAWL, SKIMMER	OTHER
130	POTS AND TRAPS	OTHER
139	POTS AND TRAPS, FISH	OTHER
140	POTS AND TRAPS, SPINY LOBSTER	OTHER
200	GILL NETS	OTHER
205	GILL NETS, RUNAROUND	OTHER
207	GILL NETS, OTHER	OTHER
660	SPEARS	OTHER
661	SPEARS, DIVING	OTHER
671	SPONGE HOOKS	OTHER
750	BY HAND, DIVING GEAR	OTHER
800	OTHER GEARS	OTHER
802	COMBINED GEARS	OTHER

Table 2: The proportion of Yellowedge Grouper (*Hyporthodus flavolimbatus*) observed in the bottom longline fishery as reported in Prytherch (1983) by FIN fishing area. Two scenarios are shown; the base scenario where areas 1-5 represent the Southeastern (East) region, areas 6-12 represent the Northeastern (Central) region, and areas 13-21 represent the Western (West) region as reported in Prytherch (1983). The low landings scenario shifts area 6 into the Southeastern region, and assumes no catch of Yellowedge in area 7. These proportions were used to assign unclassified groupers to Yellowedge Grouper landings from 1979 (the start of the longline fishery) to 1982. The justification for this sensitivity run is detailed in the SEDAR 22 report.

FIN Stat Area	Base scenario	Low landings scenario
001	0.227	0.227
002	0.227	0.227
003	0.227	0.227
004	0.227	0.227
005	0.227	0.227
006	0.963	0.227
007	0.963	0.000
008	0.963	0.963
009	0.963	0.963
010	0.963	0.963
011	0.963	0.963
012	0.963	0.963
013	0.783	0.783
014	0.783	0.783
015	0.783	0.783
016	0.783	0.783
017	0.783	0.783
018	0.783	0.783
019	0.783	0.783
020	0.783	0.783
021	0.783	0.783

Table 3: The interpolated proportions used to assign unclassified grouper landings from the longline fishery to Yellowedge Grouper for 1983 - 1985. The proportions were calculated using a linear interpolation of the proportion reported in Prytherch (1983) for the year 1982, and the proportion of Yellowedge Grouper compared to all classified groupers in 1986.

Year	EAST	CENTRAL	WEST
1983	0.191	0.789	0.802
1984	0.154	0.615	0.821
1985	0.118	0.441	0.840

Table 4: The annual proportion of Yellowedge Grouper to all classified grouper landings for each Subregion from 1986 to 2021 for the Longline fishery. These proportions were used to assign unclassified grouper landings to Yellowedge Grouper for the Longline fishery from 1986 - 2021.

Year	EAST	CENTRAL	WEST
1986	0.082	0.267	0.860
1987	0.038	0.153	0.848
1988	0.065	0.418	0.913
1989	0.007	0.255	0.864
1990	0.051	0.242	0.888
1991	0.046	0.190	0.932
1992	0.089	0.585	0.900
1993	0.040	0.156	0.719
1994	0.149	0.277	0.887
1995	0.101	0.187	0.980
1996	0.046	0.199	0.969
1997	0.123	0.176	0.950
1998	0.105	0.141	0.989
1999	0.107	0.177	0.948
2000	0.121	0.292	0.909
2001	0.077	0.172	0.875
2002	0.057	0.157	0.912
2003	0.091	0.264	0.920
2004	0.098	0.135	0.953
2005	0.098	0.089	0.979
2006	0.090	0.149	0.963
2007	0.164	0.298	0.907
2008	0.122	0.210	0.897

Year	EAST	CENTRAL	WEST
2009	0.207	0.364	0.926
2010	0.080	0.314	0.954
2011	0.060	0.178	0.964
2012	0.086	0.241	0.906
2013	0.073	0.202	0.913
2014	0.081	0.360	0.960
2015	0.064	0.344	0.948
2016	0.058	0.280	0.951
2017	0.093	0.335	0.945
2018	0.119	0.496	0.950
2019	0.190	0.361	0.966
2020	0.125	0.476	0.949
2021	0.139	0.367	0.917

Table 5: The proportion of classified grouper landings by species for each Subregion for the years 1986 - 1989 combined. These proportions were used to assign unclassified grouper landings to Yellowedge Grouper for the Vertical Line fishery from the years 1975 - 1985.

Species	CENTRAL	EAST	WEST
GRAYSBY			<0.001
GROUPER, BLACK	0.229	0.081	0.057
GROUPER, GAG	0.119	0.09	0.076
GROUPER, MARBLED			0.008
GROUPER, MISTY			<0.001
GROUPER, NASSAU	<0.001	<0.001	<0.001
GROUPER, RED	0.541	0.733	0.004
GROUPER, SNOWY	0.003	0.017	0.028
GROUPER, YELLOWEDGE	**0.05**	**0.058**	**0.546**
GROUPER, YELLOWFIN	<0.001	<0.001	0.011
GROUPER, YELLOWMOUTH			<0.001
HIND, RED			<0.001
HIND, ROCK			<0.001
HIND, SPECKLED		<0.001	0.004
SCAMP	0.057	0.02	0.264

Table 4: The annual proportion of Yellowedge Grouper to all classified grouper landings for each Subregion from 1986 to 2021 for the Vertical Line fishery. These proportions were used to assign unclassified grouper landings to Yellowedge Grouper for the Vertical Line fishery from 1986 - 2021.

Year	EAST	CENTRAL	WEST
1986	0.063	0.076	0.515
1987	0.077	0.097	0.296
1988	0.096	0.052	0.661
1989	0.008	0.016	0.546
1990	0.003	0.004	0.273
1991	0.002	0.008	0.281
1992	0.002	0.029	0.426
1993	0.007	0.013	0.296
1994	0.018	0.013	0.690
1995	0.007	0.007	0.878
1996	0.004	0.011	0.747
1997	0.009	0.004	0.648
1998	0.006	0.007	0.685
1999	0.009	0.009	0.786
2000	0.006	0.005	0.272
2001	0.004	0.003	0.220
2002	0.007	0.004	0.214
2003	0.010	0.007	0.267
2004	0.012	0.003	0.235
2005	0.004	0.005	0.200
2006	0.007	0.009	0.222
2007	0.008	0.003	0.232
2008	0.004	0.003	0.229
2009	0.009	0.005	0.308
2010	0.003	0.005	0.431
2011	0.005	0.005	0.451
2012	0.016	0.005	0.504
2013	0.006	0.005	0.289
2014	0.004	0.005	0.288
2015	0.006	0.018	0.208
2016	0.003	0.005	0.181
2017	0.001	0.007	0.285
2018	0.002	0.005	0.208
2019	0.010	0.008	0.259

Year	EAST	CENTRAL	WEST
2020	0.006	0.005	0.173
2021	0.006	0.005	0.281

Table 7: Annual IFQ correction factors used to adjust trip ticket total landings to match the reported total IFQ landings from 2010 - 2021.

Year	Correction Factor
2010	0.998
2011	1.015
2012	0.992
2013	1.012
2014	1.017
2015	1.031
2016	1.008
2017	1.016
2018	1.052
2019	0.964
2020	1.000
2021	1.001

Table 8: The annual calculated Yellowedge Grouper landings by gear grouping for each Subregion after aggregating to a two-subregion model from 1975 - 2021.

Year	East - VL + OT	East - LL	West - VL + OT	West - LL
1975	318,132		152,638	
1976	291,897		102,174	
1977	264,837		87,583	
1978	245,363		95,285	
1979	337,186		110,448	35,954
1980	329,629	460,953	63,853	49,070
1981	293,565	1,515,398	322,614	686,805
1982	263,608	3,224,888	317,013	682,543
1983	244,206	1,745,382	161,160	339,358
1984	247,534	777,962	279,081	430,574
1985	309,150	606,996	344,821	915,565
1986	323,622	438,908	91,843	464,703
1987	337,739	333,361	70,924	476,484
1988	313,225	627,106	342,374	562,298
1989	75,226	316,360	219,691	290,219
1990	19,096	431,930	50,868	440,619
1991	16,389	305,330	59,335	439,567
1992	39,373	665,230	124,728	289,073
1993	36,420	390,572	89,684	282,364
1994	52,746	775,947	56,131	272,900
1995	24,694	455,862	54,504	362,486
1996	23,522	369,745	34,343	159,410
1997	17,745	636,162	39,651	110,155
1998	23,102	465,820	85,134	145,832
1999	31,971	725,602	37,496	278,291
2000	19,719	737,456	46,316	270,207
2001	13,165	530,977	31,365	157,775
2002	18,779	421,650	33,472	269,640
2003	23,153	674,615	37,877	338,524
2004	18,353	550,933	36,472	268,874
2005	14,596	443,479	26,882	252,102
2006	19,793	445,450	20,627	207,595
2007	10,310	672,808	27,572	136,396
2008	8,272	602,463	23,676	156,429

Year	East - VL + OT	East - LL	West - VL + OT	West - LL
2009	18,669	548,634	30,053	214,392
2010	7,196	274,693	25,429	136,569
2011	9,694	303,688	29,979	215,546
2012	24,421	438,280	36,203	168,880
2013	11,517	384,104	13,656	264,072
2014	10,594	515,542	17,369	230,116
2015	22,151	406,134	7,882	299,052
2016	6,669	367,391	10,069	325,219
2017	5,162	400,003	14,286	258,476
2018	3,847	501,617	6,850	164,996
2019	8,564	506,824	9,148	280,022
2020	5,499	468,378	4,737	186,798
2021	7,941	534,069	6,541	133,116

Figures

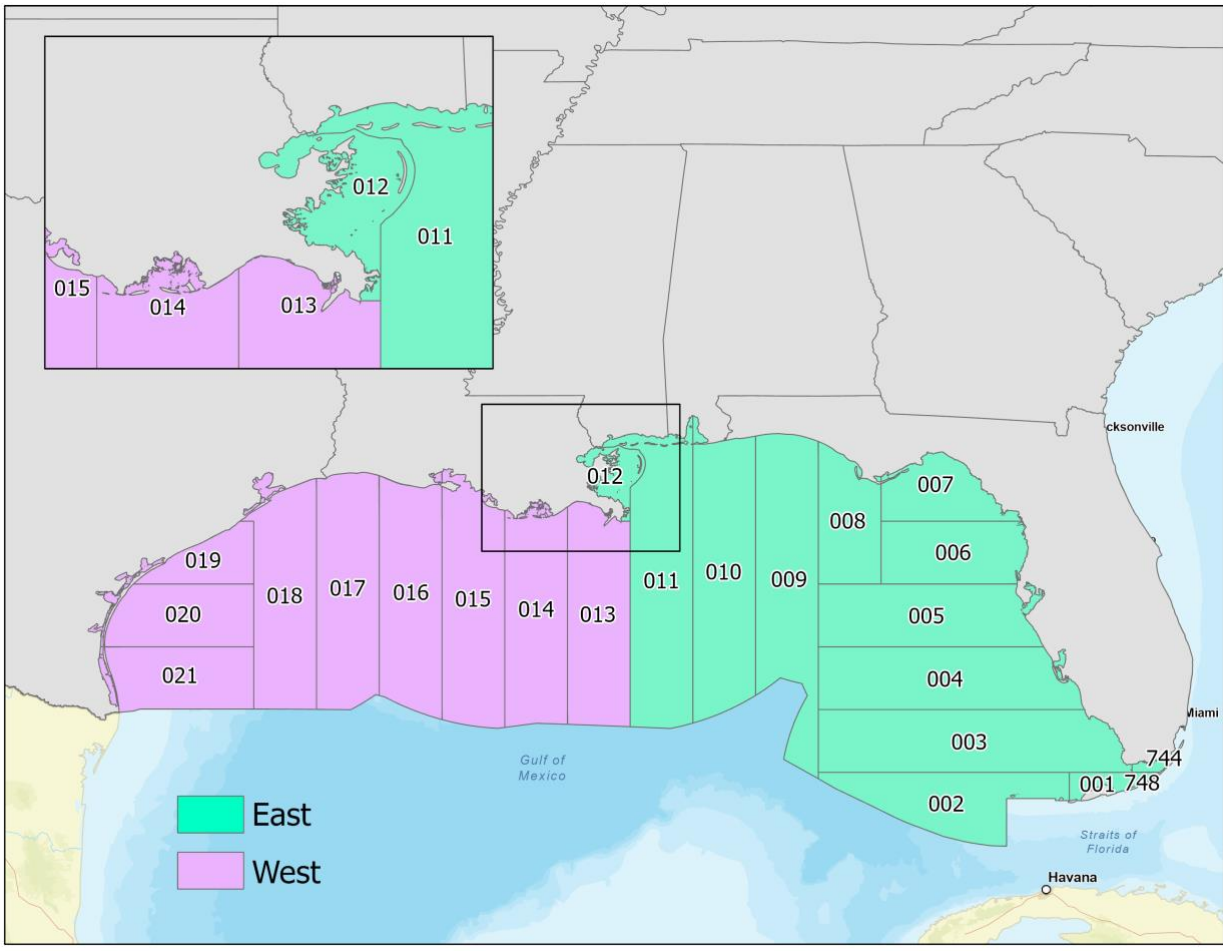

Figure 1: Gulf of Mexico commercial fishing areas.

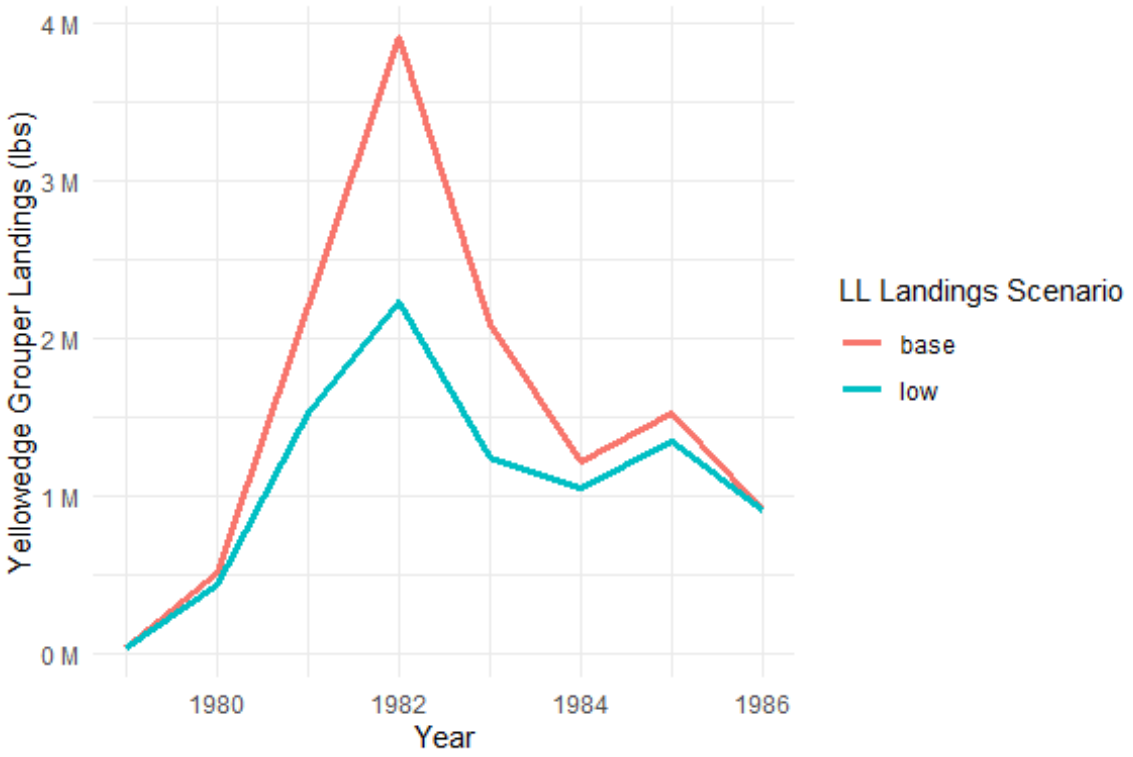

Figure 2: Annual calculated Yellowedge Grouper landings for the base and low landings scenarios for the Longline fishery for the East and West subregions combined. The scenarios only differ for 1980 - 1985.

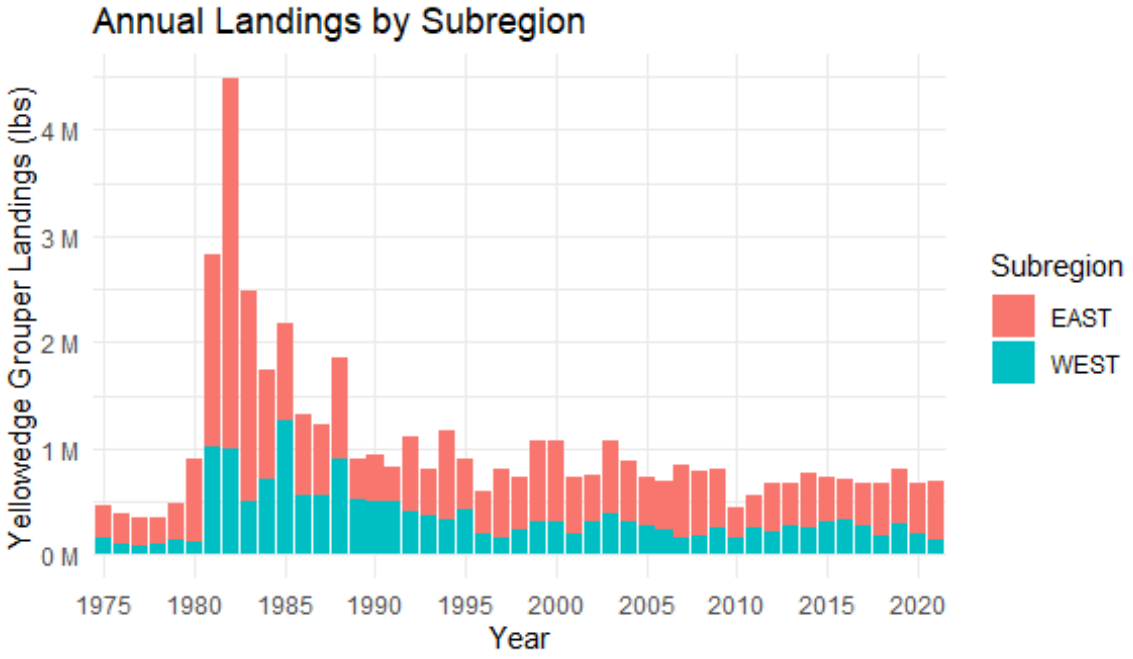

Figure 3: Annual calculated Yellowedge Grouper landings for the East and West subregions.

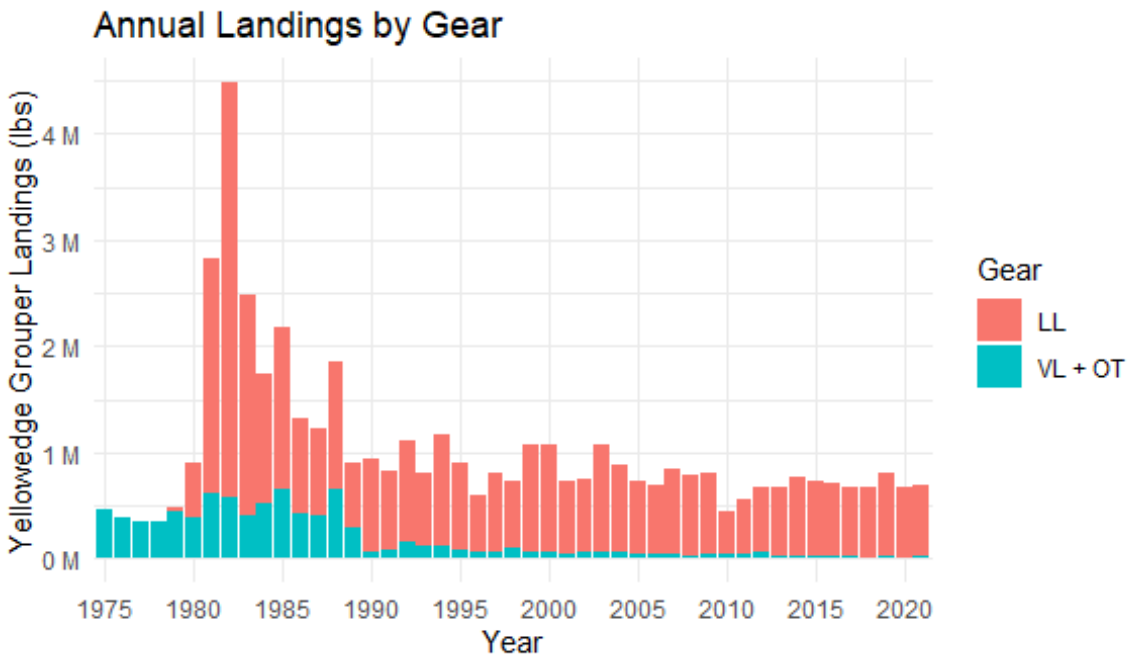

Figure 4: Annual calculated Yellowedge Grouper landings for Vertical line, Longline, and Other gears.

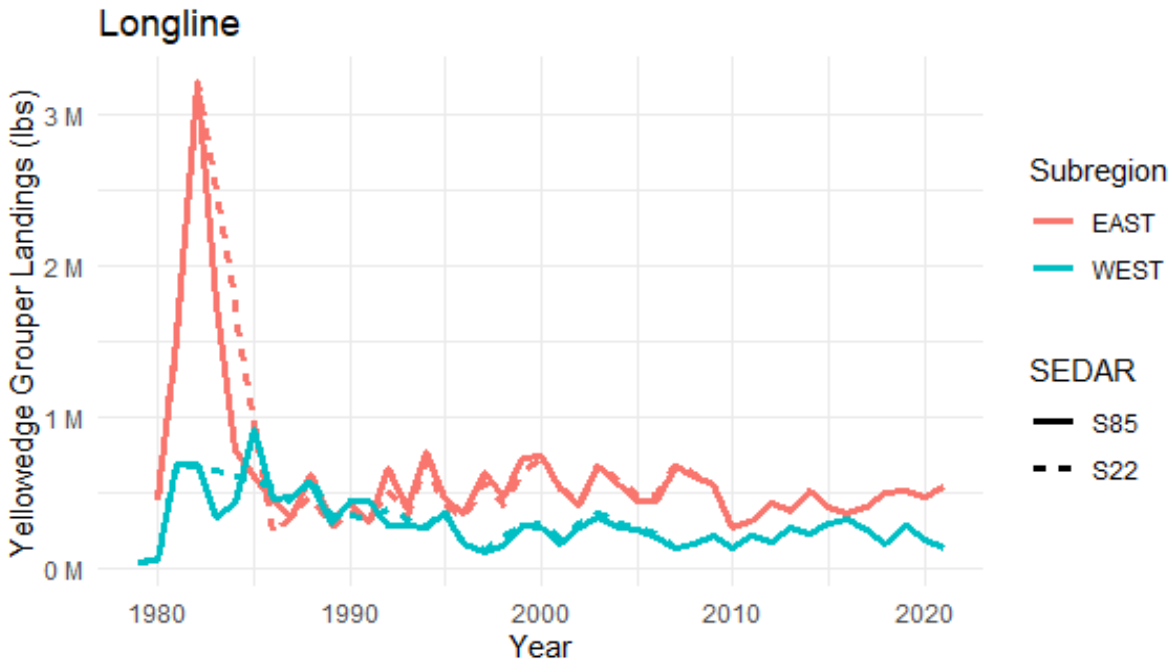

Figure 5: Annual calculated Yellowedge Grouper landings for the Longline fishery for the current SEDAR (S85) compared to the previous assessment (S22).

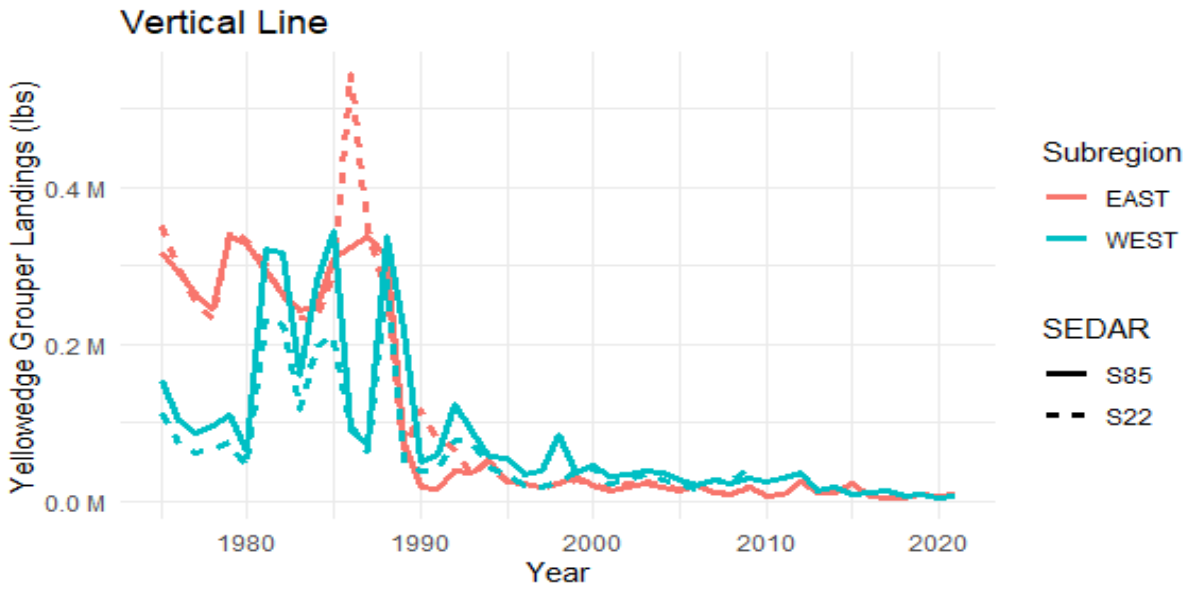

Figure 6: Annual calculated Yellowedge Grouper landings for the Vertical line fishery for the current SEDAR (S85) compared to the previous assessment (S22).