*9.12 SWO-AT - Atlantic swordfish*

The status of the North and South Atlantic swordfish stocks was assessed in 2022, by means of applying statistical modelling to the available data up to 2020. Complete information on the data availability and assessment can be found in the Report of the 2022 ICCAT Atlantic Swordfish Data Preparatory Session (Anon., 2022e) and Report of the 2022 ICCAT Atlantic Swordfish Stock Assessment (Anon., 2022f). Statistics relevant to Atlantic swordfish is presented in the Report of the 2023 Meeting of the Subcommittee on Statistics, included as **Appendix 13** to this SCRS Report, and recommendations pertinent to Atlantic swordfish are presented in Item 18.

The Commission is scheduled to adopt a management procedure (MP) for North Atlantic swordfish in 2023. As the MP has not yet been chosen, the following text is reflective of stock status and advice as prepared by the Committee in 2022.

MSE development in 2024 requires that an exceptional circumstances (EC) protocol be developed for the stock. The Committee will work with Panel 4 to develop an Exceptional Circumstances (EC) protocol.

*SWO-AT-1. Biology*

Swordfish (*Xiphias gladius*) are members of the family Xiphiidae and are in the suborder Scombroidei. They can reach a maximum weight in excess of 500 kg. They are distributed widely in the Atlantic Ocean and Mediterranean Sea. In the ICCAT Convention area, the management units of swordfish for assessment purposes are a separate Mediterranean group, and North and South Atlantic groups separated at 5°N.

Swordfish feed on a wide variety of prey including groundfish, pelagic fish, deep-water fish, and invertebrates. They are believed to feed throughout the water column, and from electronic tagging studies, undertake extensive diel vertical migrations.

Swordfish mostly spawn in the western warm tropical and subtropical waters throughout the year, although seasonality has been reported in some of these areas. They are found in the colder temperate waters during summer and fall months. Young swordfish grow very rapidly, reaching about 140 cm lower-jaw fork length (LJFL) by age three, but grow slowly thereafter. Females grow faster than males and reach a larger maximum size. Tagging studies have shown that some swordfish can live up to 15 years. Swordfish are difficult to age, but about 50% of females were considered to be mature by age five, at a length of about 180 cm. However, the most recent information indicates a smaller length and age at maturity.

The analysis of the horizontal movements shows seasonal patterns, with fish generally moving towards the equator by winter and returning to the temperate foraging grounds in spring and summer. Broader areas of mixing between some eastern and western areas were also suggested. Results obtained by up satellite tags also fully confirm the previous knowledge that was available from fishery data: deep longline settings catch swordfish during the daytime as a bycatch, while shallow setting longliners target swordfish at night closer to the surface.

Beginning in 2018, an ICCAT Swordfish Biology Programme, encompassing all three ICCAT stocks, has been conducting studies on swordfish growth, reproductive biology, and genetic analysis for identification of stock boundaries and mixing. Since programme inception, 4,647 fish have been sampled for otolith, fin spines, gonads and other tissues. The three research areas address key uncertainties important for improving the scientific advice for management of the stocks. Within each of the project areas, important scientific advances have been made:

- Ageing and growth: standards for ageing spines and otoliths; preliminary work on new growth models.
- Reproductive biology: standards for classifying reproductive status of swordfish and preliminary updates to maturity schedules.
- Genetics: identified genetic markers important for stock differentiation; identified key stock mixing areas in the North-East Atlantic; identified subpopulations within the Mediterranean.

These biological studies are ongoing, and the collective work contributes to the next major advance in the assessment of swordfish status.

### SWO-AT-2. Fishery indicators

Due to the broad geographical distribution of Atlantic swordfish (**SWO-AT-Figure 1**) in coastal and offshore areas (mostly ranging from 50ºN to 45ºS), this species is available to a large number of fishing countries. **SWO-AT-Figure 2** shows total estimated catches for North and South Atlantic swordfish. Directed longline fisheries from Canada, EU-Spain, and the United States have operated since the late 1950s or early 1960s, and harpoon fisheries have existed at least since the late 1800s. Other directed swordfish fisheries include fleets from Brazil, EU-Portugal, Morocco, Namibia, and South Africa. The primary bycatch or opportunistic fisheries that take swordfish are tuna fleets from Chinese Taipei, Japan, Korea (Rep.) and EU-France. The tuna longline fishery started in 1956 and has operated throughout the Atlantic since then, with substantial catches of swordfish that are produced as a bycatch of tuna fisheries. The largest proportion of the Atlantic catches is made using surface-drifting longline. However, many additional gears are used, including traditional gillnets off the coast of western Africa.

Trends by area (NE vs. NW Atlantic) in the CPUE indexes were consistent with the seasonal movement patterns observed in the electronic tagging data, as well as in the catches and sex-ratio distributions. Relationships observed for the eastern Atlantic were opposite to those in the western Atlantic. This pattern was correlated with the decadal cycling of the Atlantic Multidecadal Oscillation (AMO) as well as that of the North Atlantic Oscillation (NAO). Including the AMO as a covariate to area specific catchability within the assessment model helped reduce the conflicting directions of the various CPUE trends. Further analysis and hypothesis testing was recommended to determine if the relationship was due to a swordfish temperature preference, a change in prey distribution, or perhaps both. To support this hypothesis testing the Committee encouraged a group of swordfish scientists to work towards uniting the available North Atlantic swordfish CPUE data into a single dataset so that a more refined, area specific CPUE analyses could be conducted.

For both the North and South Atlantic some of the indices of abundance were affected by changes in gear technology and management that could not be accounted for in the CPUE standardization, and therefore some indices had to be split into consistent time periods.

*Total Atlantic*

The total Atlantic estimated catch (landings plus dead discards) of swordfish (North and South, including reported dead discards) in 2022 (19,092 t) was 9.5% lower than the reported catch of 2015 (21,097 t), the terminal data year in the previous assessment. Catch reports are considered to be nearly complete for 2022, however, few countries, which typically represent a small portion of the catch, have not yet reported their 2022 catches and because of unknown unreported catches, this value should be considered provisional and subject to further revision.

*North Atlantic*

For the past decade, the North Atlantic estimated catch (landings plus dead discards) has averaged about 10,400 t per year (**SWO-AT-Table 1**). The catch in 2022 (10,349 t) represents 51% of the 1987 peak in North Atlantic landings (20,238 t). These reduced landings have been attributed to ICCAT management measures, a reduction in total longline effort (Taylor *et al.,* 2020), and shifts in fleet distributions, including the movement of some vessels in certain years to the South Atlantic or out of the Atlantic. In addition, some fleets, including at least the United States, EU-Spain and EU-Portugal have changed operating procedures to opportunistically target tuna and/or sharks, taking advantage of market conditions and higher relative catch rates of these species previously considered as bycatch in some fleets. Recently, socio-economic factors, and oceanography patterns may have also contributed to the decline in catch. Task 1 and 2 data coverage is generally good, however the Committee noted the sparse discarding data for most CPCs as well as gaps in the catch and effort data for some CPCs.

Available longline CPUE series were evaluated by the Committee and certain indices were identified as suitable for use in the assessment models (Canada, Chinese Taipei, EU-Portugal, EU-Spain, Japan, Morocco, and USA). Trends in standardized CPUE series by fleets contributing to the stock assessment models are shown in **SWO-AT-Figure 3**. Most of the series have an increasing trend since the late 1990s but show a decrease or plateau in the more recent years. There have been some recent changes in United States regulations (such as time-area closures for other species like Atlantic bluefin tuna, among others) that may have impacted catch rates. The combined index used in the biomass models is shown in **SWO-AT-Figure 4**.

*South Atlantic*

The historical trend of catch (landings plus dead discards) can be divided in two periods: until 1980 and after 1980. The first one is characterized by relatively low catches, generally less than 5,000 t (with an average value of 1,824 t). After 1980, landings increased continuously up to a peak of 21,931 t in 1995, levels that are comparable to the peak of North Atlantic harvest (20,238 t in 1987). This increase of landings was, in part, due to progressive shifts of fishing effort to the South Atlantic, primarily from the North Atlantic, as well as other waters. Expansion of fishing activities by southern coastal countries, such as Brazil and Uruguay, also contributed to this increase in catches. The reduction in catch following the peak in 1995 resulted from regulations and was partly due to a shift to other oceans and target species. In 2022, the reported catch (8,743 t) is 60% lower than the 1995 reported catch (**SWO-AT-Table 1**).

Available longline CPUE series for South Atlantic swordfish were evaluated by the Committee and certain indices were identified as suitable for use in assessment models (Brazil, Chinese Taipei, EU-Spain, Japan, South Africa, Uruguay). The available indices are illustrated in **SWO-AT-Figure 5**.

*Discards*

Since 1991, very few fleets have reported dead discards (see **SWO-AT-Table 1**). The volume of North Atlantic reported dead discards reached a maximum of 1,138 t in 2000. Recent reported dead discards for the North Atlantic are significantly lower (113 t in 2020; 101 t in 2021; 74 t in 2022). For the South Atlantic, the reported discards peaked at 147 t in 2010. In 2021 and 2022, 128 t and 85 t of dead discards were respectively reported for the South Atlantic. The Committee continued to express concerns due to the low percentage of fleets that have reported annual dead discards (in t) and in many cases what has been reported is not necessarily scaled to the entire fishery.

### SWO-AT-3. State of the stocks

*North Atlantic*

In 2022, two stock assessment platforms were used to provide estimates of stock status for the North Atlantic swordfish stock as a basis for management advice. There were: a Bayesian surplus production model (JABBA - Just Another Bayesian Biomass Assessment) and the integrated assessment model Stock Synthesis (SS).

The Committee noted that the 2022 assessment represents a significant improvement in the characterization of uncertainty of current stock status for North Atlantic swordfish using updated information and integration of JABBA. The Committee agreed that management advice for North Atlantic swordfish, including stock status and projections, should be based on JABBA and SS models.

There were important developments to the modelling in 2022. In particular, the SS model provided estimates of the full weight of dead discards due to the size limit (i.e., reported and unreported) in the estimation of stock status. This analysis is consistent with the request of the Commission that the SCRS monitor and analyse the effects of the minimum size limit (Rec. 17-02, paragraph 10). This capacity will also be useful in future MSE simulations.

Based on the combined results from the two stock assessment model platforms (Stock Synthesis and JABBA), the North Atlantic swordfish stock biomass was above $B_{MSY}$ (median $B_{2020}/B_{MSY}$ = 1.08 and 95% CI of 0.71 and 1.33) and fishing mortality was below $F_{MSY}$ (median $F_{2020}/F_{MSY}$ = 0.80 and 95% CI of 0.64 and 1.24) in 2020 (**SWO-AT-Figure 6**). The median MSY was estimated as 12,819 t with 95% CI of (10,864 t and 15,289 t).

The joint Kobe phase plot shows that JABBA model results provide wider range of uncertainty than the Stock Synthesis results. Probabilities of the stock being in each quadrant of the Kobe plot (**SWO-AT-Figure 9**) are 63% in the green (not overfished not subject to overfishing), 22% in the yellow (overfished but not subject to overfishing) and 15% in the red (overfished and subject to overfishing). The results point to a stock status of not overfished (37% probability of overfished status), with no overfishing (15% probability of overfishing taking place). The estimate of stock status in 2020 is very similar to the estimated status from the previous assessment in the terminal year (2015).

*South Atlantic*

In 2022, two stock assessment platforms were used to assess the South Atlantic swordfish stock. These were a Bayesian surplus production model (JABBA) and Stock Synthesis. While Stock Synthesis was explored in 2022, only the JABBA model was used for providing advice.

The Committee acknowledged the progress made to implement a Stock Synthesis model for the South stock for the first time, but revision of size data and further model development are still required before it can be fully used for management advice. As such, the Stock Synthesis model was considered preliminary, and the Committee agreed that stock status estimates and projections for management advice should be done using only the JABBA model. For the purpose of comparison of model results across platforms only, results from Stock Synthesis are presented in **SWO-AT-Figure 7** to illustrate the overall consistency among models.

Both models were consistent and suggested a decline in stock biomass as the fishing mortality increased in the 1990s. The final JABBA results estimated that $B_{2020}$ was also below $B_{MSY}$ (median = 0.77, 95% CIs = 0.53-1.13) while $F_{2020}$ was marginally above $F_{MSY}$ (median = 1.03, 95% CIs = 0.67-1.51) (**SWO-AT-Figure 8**). The JABBA's $MSY_{2020}$ was estimated to be 11,481 t.

The southern swordfish stock biomass is overfished, and overfishing is occurring. The JABBA base case assessment indicates a 56% probability that the stock is within the red quadrant of the Kobe plot (**SWO-AT-Figure 10**).

### SWO-AT-4. Outlook

*North Atlantic*

Based on the currently available information to the Committee, both the JABBA and Stock Synthesis base models were projected to the year 2033 under constant TAC scenarios of 9,000 to 16,000 t, as well as a zero-catch scenario.

For the projections, catches for 2021 and 2022 are assumed to be constant at 10,476 t (the catch value for 2020 at the time of the assessment). Different levels of constant catch are projected for the period 2023-2033 (**SWO-AT-Table 2**). The combined Stock Synthesis and JABBA projections show that a 13,200 t constant catch, which is the current TAC level (Rec. 22-03), will have a 60% probability of being in green quadrant in 2033. However, given that the estimated MSY (that is inclusive of dead discards) is 12,819 t and $B_{2020}/B_{MSY}=1.08$, catches above MSY will results in biomass declines over the projection period (**SWO-AT-Figure 11**). Under 2021 catch (9,729 t), there is an 84-87% probability of the stock being in green quadrant by 2033 (**SWO-AT-Table 2**).

*South Atlantic*

The 2022 assessment stock status results are similar to the 2017 assessment (Anon., 2017b), but updated information used in the 2022 assessment resulted in estimates of a less productive stock ($MSY_{2020}$ = 11,481 t; $MSY_{2015}$ = 14,570 t). Specifically, a new surplus production function was objectively derived using biological information, and updated CPUE indices.

Results of projections from the 2017 assessment indicated that if catches remained below 11,000 t, there was a 60% chance of the stock falling within the green quadrant by 2020. The average catch for the period 2016-2020 was 10,125 t, yet the assessment still indicates a 56% probability that the stock is within the red quadrant in 2020 (**SWO-AT-Figure 10**). The Committee notes that this apparent inconsistency can be explained by the lower productivity (see above) of the stock determined in the 2022 assessment.

Projections were conducted for the base case JABBA model under constant TAC scenarios of 6 to 15 thousand tons, as well as a zero-catch scenario (**SWO-AT-Figure 12**). Projections were implemented in 2023 and catches for 2021 and 2022 were assumed to remain constant (9,826 t) at the average from the previous three years. Using this three-year average (9,826 t) assumed in the 2022 stock assessment, the South Atlantic swordfish stock has a 55% probability of being in the green quadrant of the Kobe plot by 2033 (**SWO-AT-Table 3**).

*SWO-AT-5. Effect of current regulations*

For the North and South Atlantic, the most germane recommendations can be found in Rec. 22-03 and Rec. 22-04, modifying Recs. 21-02 and 21-03, respectively. Should an MP be adopted in 2023, it is expected that a new recommendation would replace these.

*Catch limits*

Rec. 17-02 set the TAC for North Atlantic swordfish for 2018 at 13,200 t. This TAC has remained in place for 2023 (Rec. 21-02, Rec. 22-03). The reported catch from 2018-2022 has averaged 9,982 t and has not exceeded the TAC in any year.

Rec. 17-03 set the TAC for South Atlantic swordfish at 14,000 t for 2018, this TAC was in place from 2018-2022 (Rec. 21-03). The reported catch from 2018-2022 averaged 9,531 t and did not exceed the TAC in any year.

*Minimum size limits (Rec. 17-02)*

There are three minimum size options that are applied to the entire Atlantic: 125 cm LJFL/25 kg with a 15% tolerance (of the number of swordfish *per landing*); or 119 cm LJFL/15 kg with zero tolerance and evaluation of the discards; and for dressed fish, cleithrum to keel length of 63 cm.

Since the implementation of the minimum landing sizes in 2000, the proportion of swordfish less than 125 cm LJFL reported in the landings (in numbers) has been generally decreasing in the North Atlantic and stable in the South. In the North Atlantic, the estimate was 33% in 2000 and decreased to 23% in 2015. In the South Atlantic the estimate was 18% in 2000, had a maximum of 19% in 2006 and decreased to 13% in 2015. The Committee notes that these estimates are based on low sample sizes, are uncertain and may be biased. They will remain uncertain until CPCs fully report size samples from the entire catch. A figure of the estimated absolute biomass and numbers of fish as well as estimated proportions of undersized fish in the catch that are discarded in the North Atlantic is shown in **SWO-AT-Figure 13**. The decreasing trend can be due to a decrease in encounter rate of undersized fish due to changes in fleet behaviour, or a decrease in recruitment over time, or a combination of both.

The Committee also noted high values of hooking mortality (ranging between 78-88%) on small swordfish (<125 cm LJFL) by surface longline fisheries targeting swordfish (**SWO-AT-Figure 14**). The post-release mortality of specimens discarded alive from commercial fishing gear is unknown. Evaluating other strategies to reduce fishing mortality on juvenile swordfish will need complete datasets on fishing effort and size data over the entire Atlantic and should take into account the effects of these strategies on other species. In view of the Commission objective to reduce fishing mortality on small swordfish, the Committee therefore recommends that future work should be carried out to determine more precisely the spatial distribution and magnitude of fishing effort, the size and sex distribution of undersized swordfish in the Atlantic, using high resolution observer data.

*SWO-AT-6. Management recommendations*

*North Atlantic*

The Committee recommends that the Commission adopt one of the MSE-tested management procedures (MPs) (see item 19.28, Response to the Commission's request), and that the TAC be set based on that MP for 2024 and beyond.

**SWO-AT-Table 2** from the 2022 stock assessment shows the probabilities of maintaining $B>B_{MSY}$, maintaining $F<F_{MSY}$, and maintaining the stock in the green quadrant of the Kobe plot over a range of TAC options for North Atlantic swordfish over a period of 10 years. The combined Stock Synthesis and JABBA projections show that a 13,200 t constant catch, which is the current TAC level (Rec. 22-03), will result in a 60% probability of being in the green quadrant in 2033 (**SWO-AT-Table 2**). However, given that the estimated MSY (that is inclusive of dead discards) is 12,819 t, catches above MSY will results in biomass declines over the projection period (**SWO-AT-Figure 11**).

The Committee also recognizes that the above advice does not fully account for removals associated with the actual mortality of unreported dead and live discards, quota carryovers (15% in the North Atlantic), quota transfers across the North, and South stock management boundaries nor the total cumulative quota, which includes catch allocated to "other CPCs" and would fall above the TAC if achieved. The Committee emphasizes that the importance of this uncertainty be taken into consideration by the Commission when adopting a TAC.

*South Atlantic*

**SWO-AT-Table 3** shows the probabilities of maintaining B>$B_{MSY}$, maintaining F<$F_{MSY}$, and maintaining the stock in the green quadrant of the Kobe plot over a range of TAC options for South Atlantic swordfish over a period through 2033. The current TAC of 14,000 t (Rec. 22-04) is unlikely (3% probability) to result in the stock being in the green quadrant of the Kobe plot by 2033. The reported catch for 2022 was 8,743 t. Catch levels less than 10,000 t will accelerate rebuilding.

The Committee also recognizes that as was the case for the northern stock, the above advice does not fully account for removals associated with the mortality of unreported dead and post release mortality of live discards, quota carryovers (30% in the South Atlantic) nor quota transfers across the North and South stock management boundaries. The Committee emphasizes the importance of these uncertainties and recommends that the stock be closely monitored in the upcoming years to confirm rebuilding.

| ATLANTIC SWORDFISH SUMMARY | | |
|---|---|---|
| | ***North Atlantic*** | ***South Atlantic*** |
| Maximum Sustainable Yield | 12,819 t (10,864 t-15,289 t)[1] | 11,481 t (9,793 t-13,265 t)[2] |
| Current (2022) TAC | 13,200 t | 14,000 t |
| Current (2022) Yield[3] | 10,349 t | 8,743 t |
| Yield in last year used in assessment (2020)[4] | 10,668 t | 9,020 t |
| $B_{MSY}$ (CI) | 57,919 t (23,666 t-153,156 t)[5] | 74,641 t (60,179 t-92,946 t)[2] |
| | | |
| $F_{MSY}$ | 0.15 (0.08-0.23)[5] | 0.15 (0.12-0.19)[2] |
| Relative Biomass ($B_{2020}/B_{MSY}$) | 1.08 (0.71-1.33)[5] | 0.77 (0.53-1.11)[2] |
| | | |
| Relative Fishing Mortality ($F_{2020}/F_{MSY}$) | 0.80 (0.64-1.24)[5] | 1.03 (0.67-1.51)[2] |
| Stock Status (2020) | Overfished: NO | Overfished: YES |
| | Overfishing: NO | Overfishing: YES |
| | | |
| Management Measures in Effect | Country-specific TACs Rec. 22-03: Minimum size 125/119 cm LJFL[6] | Country-specific TACs Rec. 22-04: Minimum size 125/119 cm LJFL[7] |

[1] Median from base case JABBA and Stock Synthesis models; range corresponding to the lowest and highest 95% CIs from the two models.

[2] Median and 95% CIs from base case JABBA model.

[3] Provisional and subject to revision.

[4] Based on catch data available in July 2021 for the stock assessment session.

[5] Median and 95% quantiles from base case Stock Synthesis and JABBA models.

[6] Associated alternatives listed in Rec. 17-02.

[7] Associated alternatives listed in Rec. 17-03.

**SWO-AT-Table 1.** Estimated catches (t) of Atlantic swordfish (*Xiphias gladius*) by gear and flag.

| | | | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TOTAL | | | 32868 | 34460 | 39036 | 33511 | 31567 | 26356 | 27124 | 27181 | 25139 | 23758 | 24078 | 25153 | 25544 | 25724 | 27935 | 23472 | 24814 | 24267 | 23914 | 24576 | 21282 | 20678 | 21097 | 21112 | 20833 | 19403 | 20334 | 19383 | 19352 | 19092 |
| | ATN | | 16738 | 15501 | 17105 | 15222 | 13025 | 12329 | 11622 | 11453 | 10011 | 9654 | 11444 | 12071 | 12380 | 11528 | 12306 | 11102 | 12146 | 11672 | 12709 | 13890 | 12078 | 10708 | 10752 | 10501 | 10295 | 9025 | 10244 | 10445 | 9845 | 10349 |
| | ATS | | 16130 | 18958 | 21931 | 18289 | 18542 | 14027 | 15502 | 15728 | 15128 | 14104 | 12634 | 13082 | 13163 | 14196 | 15629 | 12370 | 12668 | 12596 | 11205 | 10686 | 9204 | 9970 | 10345 | 10611 | 10537 | 10378 | 10090 | 8938 | 9508 | 8743 |
| Landings | ATN | Longline | 15804 | 14365 | 15864 | 13822 | 12204 | 11062 | 10717 | 9922 | 8678 | 8799 | 10334 | 11410 | 11531 | 10896 | 11478 | 10394 | 11504 | 11077 | 11796 | 12976 | 11366 | 10089 | 10194 | 9913 | 9462 | 8401 | 9340 | 9746 | 9226 | 9817 |
| | | Other surf. | 526 | 428 | 715 | 812 | 370 | 782 | 376 | 393 | 432 | 240 | 486 | 341 | 516 | 409 | 546 | 465 | 485 | 441 | 511 | 512 | 513 | 463 | 391 | 483 | 684 | 472 | 600 | 587 | 517 | 457 |
| | ATS | Longline | 15739 | 17839 | 21584 | 17859 | 18299 | 13748 | 14823 | 15448 | 14302 | 13576 | 11714 | 12558 | 12915 | 13984 | 15318 | 11980 | 12301 | 12087 | 10854 | 10255 | 8958 | 9736 | 10047 | 10461 | 10281 | 10323 | 9975 | 8814 | 9332 | 8606 |
| | | Other surf. | 391 | 1119 | 347 | 429 | 222 | 269 | 672 | 278 | 826 | 527 | 920 | 523 | 248 | 212 | 221 | 384 | 368 | 361 | 277 | 291 | 246 | 189 | 254 | 148 | 145 | 27 | 65 | 66 | 47 | 52 |
| Discards | ATN | Longline | 408 | 708 | 526 | 562 | 439 | 476 | 525 | 1137 | 896 | 607 | 618 | 313 | 323 | 215 | 273 | 235 | 151 | 148 | 392 | 391 | 199 | 156 | 167 | 105 | 149 | 152 | 304 | 113 | 100 | 71 |
| | | Other surf. | 0 | 0 | 0 | 26 | 12 | 9 | 4 | 1 | 6 | 8 | 5 | 7 | 10 | 8 | 8 | 9 | 7 | 5 | 9 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 |
| | ATS | Longline | 0 | 0 | 0 | 1 | 21 | 10 | 6 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 91 | 6 | 0 | 147 | 74 | 140 | 0 | 46 | 43 | 2 | 111 | 26 | 50 | 57 | 128 | 85 |
| | | Other surf. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Landings | ATN CP | Barbados | 0 | 0 | 0 | 33 | 16 | 16 | 12 | 13 | 19 | 10 | 21 | 25 | 44 | 39 | 27 | 39 | 20 | 13 | 23 | 21 | 16 | 21 | 29 | 20 | 21 | 18 | 10 | 12 | 13 | 8 |
| | | Belize | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 1 | 112 | 106 | 184 | 141 | 142 | 76 | 1 | 3 | 59 | 145 | 117 | 111 | 121 | 70 |
| | | Brazil | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 117 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Canada | 2234 | 1676 | 1610 | 739 | 1089 | 1115 | 1119 | 968 | 1079 | 959 | 1285 | 1203 | 1558 | 1404 | 1348 | 1334 | 1300 | 1346 | 1551 | 1489 | 1505 | 1604 | 1579 | 1548 | 1188 | 782 | 995 | 1334 | 1377 | 1342 |
| | | China PR | 73 | 86 | 104 | 132 | 40 | 337 | 304 | 22 | 102 | 90 | 316 | 56 | 108 | 72 | 85 | 92 | 92 | 73 | 75 | 59 | 96 | 60 | 141 | 135 | 81 | 86 | 92 | 96 | 44 | 38 |
| | | Curaçao | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Côte d'Ivoire | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 8 | 17 |
| | | EU-Denmark | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | EU-España | 6598 | 6185 | 7176 | 5547 | 5140 | 4084 | 3996 | 4595 | 3968 | 3957 | 4586 | 5376 | 5521 | 5448 | 5564 | 4366 | 4949 | 4147 | 4889 | 5622 | 4084 | 3750 | 4013 | 3916 | 3586 | 3186 | 3112 | 3587 | 3235 | 3717 |
| | | EU-France | 95 | 46 | 84 | 97 | 164 | 110 | 104 | 122 | 0 | 74 | 169 | 102 | 178 | 92 | 46 | 14 | 15 | 35 | 16 | 94 | 44 | 28 | 66 | 90 | 79 | 80 | 82 | 90 | 103 | 120 |
| | | EU-Germany | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | EU-Ireland | 7 | 0 | 0 | 15 | 15 | 132 | 81 | 35 | 17 | 5 | 12 | 1 | 1 | 3 | 2 | 2 | 1 | 1 | 2 | 5 | 2 | 3 | 15 | 15 | 10 | 13 | 3 | 24 | 9 | 22 |
| | | EU-Netherlands | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | EU-Poland | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | EU-Portugal | 1961 | 1599 | 1617 | 1703 | 903 | 773 | 777 | 732 | 735 | 766 | 1032 | 1320 | 900 | 949 | 778 | 747 | 898 | 1054 | 1203 | 882 | 1438 | 1241 | 1420 | 1460 | 1871 | 1691 | 2392 | 2070 | 2165 | 1750 |
| | | EU-Rumania | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | El Salvador | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | FR-St Pierre et Miquelon | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 3 | 36 | 48 | 0 | 82 | 48 | 17 | 90 | 1 | 0 | 18 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 78 |
| | | Great Britain | 2 | 3 | 1 | 5 | 11 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 49 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Grenada | 13 | 0 | 1 | 4 | 15 | 15 | 42 | 84 | 0 | 54 | 88 | 73 | 56 | 30 | 26 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | 29 | 36 | 36 | 22 | 15 | 4 | 14 |
| | | Guatemala | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Iceland | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Japan | 1126 | 933 | 1043 | 1494 | 1218 | 1391 | 1089 | 161 | 0 | 0 | 0 | 575 | 705 | 656 | 889 | 935 | 778 | 1062 | 523 | 639 | 300 | 545 | 430 | 379 | 456 | 325 | 355 | 406 | 370 | 499 |
| | | Korea Rep | 19 | 16 | 16 | 19 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 | 65 | 175 | 157 | 3 | 0 | 0 | 0 | 64 | 35 | 0 | 9 | 19 | 9 | 9 | 14 | 13 | 17 |
| | | Liberia | 14 | 26 | 28 | 28 | 28 | 28 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 95 | 5 | 7 | 3 | 8 | 0 | 0 |
| | | Maroc | 39 | 36 | 79 | 462 | 267 | 292 | 119 | 114 | 523 | 223 | 329 | 335 | 339 | 341 | 237 | 430 | 724 | 968 | 782 | 770 | 1062 | 1062 | 850 | 900 | 900 | 950 | 950 | 936 | 955 | 1085 |
| | | Mexico | 6 | 14 | 10 | 22 | 14 | 28 | 24 | 37 | 27 | 34 | 32 | 44 | 41 | 31 | 35 | 34 | 32 | 35 | 38 | 40 | 33 | 32 | 31 | 36 | 64 | 44 | 30 | 21 | 25 | 22 |
| | | Norway | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Panama | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Philippines | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 44 | 5 | 0 | 8 | 0 | 22 | 28 | 0 | 17 | 36 | 9 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Russian Federation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Senegal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 38 | 41 | 87 | 113 | 148 | 44 | 43 | 49 | 78 | 146 | 112 | 89 | 121 | 33 | 6 | 0 | 0 |
| | | Sierra Leone | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | St Vincent and Grenadines | 23 | 0 | 4 | 3 | 1 | 0 | 1 | 0 | 22 | 22 | 7 | 7 | 7 | 7 | 51 | 7 | 34 | 13 | 11 | 8 | 4 | 40 | 102 | 33 | 46 | 26 | 12 | 7 | 0 | 2 |
| | | Trinidad and Tobago | 11 | 180 | 150 | 158 | 110 | 130 | 138 | 41 | 75 | 92 | 78 | 83 | 91 | 19 | 29 | 48 | 30 | 21 | 16 | 14 | 16 | 26 | 17 | 13 | 36 | 3 | 6 | 8 | 6 | 6 |
| | | UK-Bermuda | 0 | 0 | 1 | 1 | 5 | 5 | 3 | 3 | 2 | 0 | 0 | 1 | 1 | 0 | 3 | 4 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 6 | 5 | 3 |
| | | UK-British Virgin Islands | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 7 | 0 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | UK-Turks and Caicos | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | USA | 3783 | 3366 | 4026 | 3559 | 2987 | 3058 | 2908 | 2863 | 2217 | 2384 | 2513 | 2380 | 2160 | 1873 | 2463 | 2387 | 2730 | 2274 | 2551 | 3393 | 2824 | 1809 | 1581 | 1408 | 1294 | 1135 | 1449 | 1351 | 1142 | 1278 |
| | | USSR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Venezuela | 73 | 69 | 54 | 85 | 20 | 37 | 30 | 44 | 21 | 34 | 45 | 53 | 55 | 22 | 30 | 11 | 13 | 24 | 18 | 25 | 24 | 24 | 34 | 56 | 58 | 36 | 35 | 16 | 13 | 17 |
| | NCC | Chinese Taipei | 127 | 507 | 489 | 521 | 509 | 286 | 285 | 347 | 299 | 310 | 257 | 30 | 140 | 172 | 103 | 82 | 89 | 88 | 192 | 166 | 115 | 78 | 115 | 148 | 78 | 162 | 115 | 144 | 66 | 145 |
| | | Costa Rica | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 4 | 3 | 2 | 4 | 11 | 6 | 11 | 23 | 21 | 22 | 30 | 34 | 26 | 44 | 43 | 23 | 19 | 51 | 26 |
| | | Guyana | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 10 | 5 | 2 | 5 | 3 | 0 | |
| | NCO | Cuba | 16 | 50 | 86 | 7 | 7 | 7 | 7 | 0 | 0 | 10 | 3 | 3 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | Dominica | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | |
| | | Faroe Islands | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

| | | | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NEI (Flag related) | 111 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | Saint Kitts and Nevis | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | |
| | | Seychelles | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | Sta Lucia | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| | | Vanuatu | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 35 | 29 | 14 | 0 | 0 | 0 | 10 | 23 | 15 | 2 | 4 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ATS | CP | Angola | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 0 | 0 | 13 | 0 | 0 | 0 | 34 | 74 |
| | | Belize | 0 | 0 | 1 | 0 | 0 | 0 | 17 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 120 | 32 | 111 | 121 | 207 | 197 | 136 | 45 | 111 | 176 | 166 | 115 | 55 | 2 | 2 | 2 |
| | | Brazil | 2013 | 1571 | 1975 | 1892 | 4100 | 3847 | 4721 | 4579 | 4082 | 2910 | 2920 | 2998 | 3785 | 4430 | 4153 | 3407 | 3386 | 2926 | 3033 | 2833 | 2384 | 2892 | 2599 | 2938 | 2410 | 2798 | 2863 | 2110 | 2823 | 2197 |
| | | China PR | 0 | 0 | 0 | 0 | 0 | 29 | 534 | 344 | 200 | 423 | 353 | 278 | 91 | 300 | 473 | 470 | 291 | 296 | 248 | 316 | 196 | 206 | 328 | 222 | 302 | 355 | 211 | 89 | 37 | 188 |
| | | Curaçao | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Côte d'Ivoire | 14 | 20 | 19 | 26 | 18 | 25 | 26 | 20 | 19 | 19 | 43 | 29 | 31 | 39 | 17 | 24 | 145 | 156 | 58 | 89 | 133 | 68 | 48 | 58 | 41 | 57 | 123 | 19 | 14 | 24 |
| | | EU-Bulgaria | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | EU-España | 6974 | 7937 | 11290 | 9622 | 8461 | 5832 | 5758 | 6388 | 5789 | 5741 | 4527 | 5483 | 5402 | 5300 | 5283 | 4073 | 5183 | 5801 | 4700 | 4852 | 4184 | 4113 | 5059 | 4992 | 4656 | 4404 | 4224 | 4442 | 4470 | 3592 |
| | | EU-France | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 |
| | | EU-Lithuania | 0 | 794 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | EU-Portugal | 0 | 0 | 380 | 389 | 441 | 384 | 381 | 392 | 393 | 380 | 354 | 345 | 493 | 440 | 428 | 271 | 367 | 232 | 263 | 184 | 125 | 252 | 236 | 250 | 466 | 369 | 323 | 335 | 224 | 210 |
| | | El Salvador | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Gabon | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 2 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Ghana | 121 | 51 | 103 | 140 | 44 | 106 | 121 | 117 | 531 | 372 | 734 | 343 | 55 | 32 | 65 | 177 | 132 | 116 | 60 | 54 | 37 | 26 | 56 | 36 | 55 | 6 | 32 | 31 | 19 | 16 |
| | | Great Britain | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Guatemala | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Guinea Ecuatorial | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Honduras | 0 | 0 | 6 | 4 | 5 | 2 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Japan | 5256 | 4699 | 3619 | 2197 | 1494 | 1186 | 775 | 790 | 685 | 833 | 924 | 686 | 480 | 1090 | 2155 | 1600 | 1340 | 1314 | 1233 | 1162 | 684 | 976 | 659 | 637 | 915 | 640 | 647 | 552 | 498 | 667 |
| | | Korea Rep | 198 | 164 | 164 | 7 | 18 | 7 | 5 | 10 | 0 | 2 | 24 | 70 | 36 | 94 | 176 | 223 | 10 | 0 | 42 | 47 | 53 | 5 | 19 | 11 | 18 | 9 | 15 | 6 | 6 | |
| | | Namibia | 0 | 22 | 0 | 0 | 0 | 0 | 730 | 469 | 751 | 504 | 191 | 549 | 832 | 1118 | 1038 | 518 | 25 | 417 | 414 | 85 | 129 | 395 | 225 | 466 | 600 | 881 | 811 | 789 | 623 | 1100 |
| | | Nigeria | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Panama | 0 | 0 | 0 | 0 | 0 | 29 | 105 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Philippines | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 1 | 8 | 1 | 1 | 4 | 58 | 41 | 49 | 14 | 35 | 15 | 35 | 58 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | S Tomé e Príncipe | 202 | 190 | 178 | 166 | 148 | 135 | 129 | 120 | 120 | 120 | 120 | 126 | 147 | 138 | 138 | 183 | 188 | 193 | 60 | 84 | 60 | 94 | 145 | 77 | 65 | 1 | 12 | 4 | 14 | 11 |
| | | Senegal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 77 | 97 | 137 | 78 | 117 | 162 | 178 | 143 | 97 | 90 | 112 | 65 | 116 | 38 | 0 | 0 |
| | | South Africa | 4 | 1 | 4 | 1 | 1 | 240 | 143 | 328 | 547 | 649 | 293 | 295 | 199 | 186 | 207 | 142 | 170 | 145 | 97 | 50 | 171 | 152 | 218 | 164 | 189 | 189 | 251 | 149 | 179 | 161 |
| | | St Vincent and Grenadines | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 7 | 16 | 4 | 3 | 2 | 2 | 19 | 0 | 5 | 9 | 4 | 15 | 9 | 32 | 76 |
| | | UK-Sta Helena | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 4 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 6 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | USA | 0 | 0 | 0 | 171 | 396 | 160 | 179 | 142 | 43 | 200 | 21 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | USSR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Uruguay | 260 | 165 | 499 | 644 | 760 | 889 | 650 | 713 | 789 | 768 | 850 | 1105 | 843 | 620 | 464 | 370 | 501 | 222 | 179 | 40 | 103 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | NCC | Chinese Taipei | 846 | 2829 | 2876 | 2873 | 2562 | 1147 | 1168 | 1303 | 1149 | 1164 | 1254 | 745 | 744 | 377 | 671 | 727 | 612 | 410 | 424 | 379 | 582 | 406 | 511 | 478 | 416 | 446 | 346 | 296 | 406 | 335 |
| | NCO | Argentina | 14 | 24 | 0 | 0 | 0 | 0 | 38 | 0 | 5 | 10 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | Benin | 28 | 25 | 24 | 24 | 10 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | Cambodia | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | Cuba | 192 | 452 | 778 | 60 | 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | Mixed flags (FR+ES) | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | NEI (Flag related) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | Seychelles | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | Togo | 8 | 14 | 14 | 64 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 10 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | Vanuatu | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 26 | 6 | 3 | 0 | 3 | 1 | 3 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Discards | ATN CP | Canada | 0 | 0 | 0 | 0 | 5 | 52 | 35 | 50 | 26 | 33 | 79 | 45 | 106 | 38 | 61 | 39 | 9 | 15 | 8 | 111 | 59 | 12 | 8 | 11 | 21 | 5 | 2 | 2 | 3 | 2 |
| | | EU-France | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | EU-Portugal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 |
| | | Japan | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 598 | 567 | 319 | 263 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 5 | 5 | 2 |
| | | Korea Rep | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 170 | 46 | 19 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Mexico | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | UK-Bermuda | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | USA | 408 | 708 | 526 | 588 | 446 | 433 | 494 | 490 | 308 | 263 | 282 | 275 | 227 | 185 | 220 | 205 | 148 | 138 | 223 | 217 | 120 | 137 | 137 | 90 | 111 | 140 | 287 | 91 | 90 | 61 |
| | NCC | Chinese Taipei | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 0 | 7 | 18 | 4 | 18 | 7 | 7 | 14 | 2 | 5 |
| | ATS CP | Brazil | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 91 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | EU-France | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| | | Japan | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| | | Korea Rep | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 147 | 70 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South Africa | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| USA | 0 | 0 | 0 | 1 | 21 | 10 | 6 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| NCC Chinese Taipei | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 117 | 0 | 45 | 43 | 2 | 111 | 26 | 49 | 57 | 126 | 85 |

**SWO-AT-Table 2.** Joint probabilities of the North Atlantic swordfish stock being below $F_{MSY}$ (top, overfishing not occurring), above $B_{MSY}$ (middle, not overfished) as well as the joint probability of being above $B_{MSY}$ and below $F_{MSY}$ (bottom, green zone) in a given year for a given catch level based on 30,000 iterations of the MVLN approximation for Stock Synthesis and JABBA MCMC iterations.

Probability F<$F_{MSY}$

| TAC (t) | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0t | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| 9000t | 94% | 94% | 94% | 94% | 94% | 94% | 94% | 94% | 94% | 94% | 94% |
| 10000t | 90% | 90% | 90% | 90% | 90% | 90% | 90% | 90% | 90% | 90% | 90% |
| 11000t | 85% | 85% | 85% | 85% | 85% | 85% | 85% | 85% | 85% | 85% | 85% |
| 12000t | 79% | 79% | 79% | 79% | 79% | 80% | 80% | 80% | 79% | 79% | 79% |
| 12500t | 76% | 76% | 76% | 76% | 76% | 76% | 76% | 76% | 76% | 76% | 76% |
| 12600t | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 76% | 75% | 75% | 75% |
| 12700t | 74% | 74% | 74% | 74% | 74% | 74% | 74% | 74% | 74% | 74% | 74% |
| 12800t | 74% | 73% | 73% | 73% | 73% | 73% | 73% | 73% | 73% | 73% | 73% |
| 12900t | 73% | 72% | 72% | 72% | 72% | 72% | 72% | 72% | 71% | 71% | 71% |
| 13000t | 72% | 71% | 71% | 71% | 71% | 70% | 70% | 70% | 69% | 69% | 68% |
| 13100t | 71% | 70% | 70% | 69% | 69% | 68% | 68% | 67% | 66% | 66% | 65% |
| 13200t | 70% | 69% | 69% | 68% | 67% | 66% | 65% | 64% | 63% | 62% | 61% |
| 13300t | 69% | 68% | 67% | 66% | 65% | 63% | 62% | 61% | 59% | 58% | 56% |
| 13400t | 68% | 66% | 65% | 64% | 62% | 60% | 59% | 57% | 55% | 53% | 51% |
| 13500t | 66% | 65% | 63% | 61% | 59% | 57% | 55% | 53% | 51% | 48% | 46% |
| 13600t | 65% | 63% | 61% | 59% | 56% | 54% | 51% | 49% | 46% | 43% | 41% |
| 13700t | 63% | 61% | 59% | 56% | 53% | 50% | 47% | 44% | 41% | 38% | 36% |
| 13800t | 62% | 59% | 56% | 53% | 50% | 46% | 43% | 40% | 37% | 34% | 32% |
| 14000t | 58% | 55% | 51% | 47% | 43% | 39% | 35% | 32% | 29% | 27% | 25% |
| 15000t | 38% | 31% | 25% | 21% | 25% | 32% | 32% | 31% | 31% | 30% | 29% |
| 16000t | 20% | 15% | 12% | 11% | 10% | 10% | 10% | 9% | 9% | 9% | 9% |

Probability B>$B_{MSY}$

| TAC (t) | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0t | 75% | 84% | 90% | 94% | 96% | 97% | 98% | 98% | 99% | 99% | 99% |
| 9000t | 75% | 78% | 80% | 82% | 83% | 84% | 85% | 86% | 86% | 87% | 87% |
| 10000t | 75% | 77% | 79% | 80% | 81% | 82% | 83% | 83% | 83% | 84% | 84% |
| 11000t | 75% | 76% | 77% | 78% | 79% | 79% | 80% | 80% | 81% | 81% | 81% |
| 12000t | 75% | 75% | 76% | 76% | 77% | 77% | 77% | 77% | 77% | 77% | 77% |
| 12500t | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% |
| 12600t | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% | 75% |
| 12700t | 75% | 75% | 74% | 74% | 74% | 74% | 74% | 74% | 74% | 74% | 74% |
| 12800t | 75% | 74% | 74% | 74% | 74% | 74% | 74% | 74% | 74% | 73% | 73% |
| 12900t | 75% | 74% | 74% | 74% | 73% | 73% | 73% | 73% | 73% | 72% | 72% |
| 13000t | 75% | 74% | 74% | 73% | 73% | 73% | 72% | 72% | 72% | 71% | 71% |
| 13100t | 75% | 74% | 73% | 73% | 72% | 72% | 72% | 71% | 70% | 70% | 69% |
| 13200t | 75% | 74% | 73% | 72% | 72% | 71% | 71% | 70% | 69% | 68% | 67% |
| 13300t | 75% | 74% | 73% | 72% | 71% | 70% | 69% | 68% | 67% | 66% | 65% |
| 13400t | 75% | 74% | 73% | 72% | 70% | 70% | 68% | 67% | 65% | 64% | 62% |
| 13500t | 75% | 74% | 72% | 71% | 70% | 68% | 67% | 65% | 63% | 61% | 59% |
| 13600t | 74% | 74% | 72% | 71% | 69% | 67% | 65% | 63% | 61% | 58% | 55% |
| 13700t | 74% | 73% | 72% | 70% | 68% | 66% | 64% | 61% | 58% | 55% | 52% |
| 13800t | 74% | 73% | 71% | 70% | 67% | 65% | 62% | 59% | 55% | 52% | 48% |
| 14000t | 74% | 73% | 71% | 68% | 65% | 62% | 58% | 54% | 50% | 45% | 41% |
| 15000t | 74% | 71% | 66% | 59% | 47% | 44% | 42% | 41% | 39% | 38% | 36% |
| 16000t | 74% | 69% | 59% | 48% | 36% | 27% | 21% | 18% | 16% | 15% | 14% |

Probability F<$F_{MSY}$ and B>$B_{MSY}$

| TAC (t) | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0t | 75% | 84% | 90% | 94% | 96% | 97% | 98% | 98% | 99% | 99% | 99% |
| 9000t | 75% | 78% | 80% | 82% | 83% | 84% | 85% | 86% | 86% | 87% | 87% |
| 10000t | 75% | 77% | 79% | 80% | 81% | 82% | 83% | 83% | 83% | 84% | 84% |
| 11000t | 75% | 76% | 77% | 78% | 79% | 79% | 80% | 80% | 80% | 81% | 81% |
| 12000t | 74% | 75% | 75% | 76% | 76% | 76% | 77% | 77% | 77% | 77% | 77% |
| 12500t | 73% | 73% | 74% | 74% | 74% | 74% | 74% | 75% | 75% | 75% | 75% |
| 12600t | 73% | 73% | 73% | 73% | 74% | 74% | 74% | 74% | 74% | 74% | 74% |
| 12700t | 72% | 72% | 73% | 73% | 73% | 73% | 73% | 73% | 73% | 73% | 73% |
| 12800t | 72% | 72% | 72% | 72% | 72% | 72% | 72% | 72% | 72% | 72% | 72% |
| 12900t | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 71% | 70% | 70% | 70% |
| 13000t | 70% | 70% | 70% | 70% | 70% | 69% | 69% | 69% | 68% | 68% | 67% |
| 13100t | 70% | 69% | 69% | 69% | 68% | 67% | 67% | 66% | 66% | 65% | 64% |
| 13200t | 69% | 68% | 68% | 67% | 66% | 65% | 64% | 63% | 62% | 61% | 60% |
| 13300t | 68% | 67% | 66% | 65% | 64% | 63% | 61% | 60% | 59% | 57% | 56% |
| 13400t | 67% | 66% | 64% | 63% | 61% | 60% | 58% | 56% | 54% | 53% | 51% |
| 13500t | 66% | 64% | 62% | 61% | 59% | 57% | 55% | 53% | 50% | 48% | 46% |
| 13600t | 64% | 62% | 60% | 58% | 56% | 53% | 51% | 48% | 46% | 43% | 40% |
| 13700t | 63% | 61% | 58% | 55% | 53% | 50% | 47% | 44% | 41% | 38% | 36% |
| 13800t | 61% | 59% | 56% | 53% | 49% | 46% | 43% | 40% | 37% | 34% | 32% |
| 14000t | 58% | 55% | 51% | 47% | 43% | 39% | 35% | 32% | 29% | 27% | 25% |
| 15000t | 38% | 31% | 25% | 21% | 22% | 32% | 30% | 29% | 27% | 26% | 25% |
| 16000t | 20% | 15% | 12% | 11% | 10% | 10% | 10% | 9% | 9% | 9% | 9% |

**SWO-AT-Table 3.** Estimated projection probabilities (%) for the reference case model for South Atlantic swordfish. Projection probabilities are provided for F<=F$_{MSY}$ (top); B>=B$_{MSY}$ (middle); F<=F$_{MSY}$ and B>=B$_{MSY}$ (bottom). Stochastic projections were conducted over the period 2023-2033 with a range of fixed TACs (6,000 – 15,000 t), including a zero catch-scenario. The 2021 and 2022 catches are assumed to be 9,826 t, which is the mean of the 2018-2020 reported catch.

Probability F<=F$_{MSY}$

| TAC (t) | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| 6000 | 95% | 97% | 98% | 98% | 99% | 99% | 99% | 99% | 100% | 100% | 100% |
| 6500 | 92% | 94% | 96% | 97% | 98% | 98% | 99% | 99% | 99% | 99% | 99% |
| 7000 | 88% | 91% | 93% | 95% | 96% | 97% | 97% | 98% | 98% | 98% | 98% |
| 7500 | 82% | 86% | 89% | 91% | 93% | 94% | 95% | 96% | 96% | 97% | 97% |
| 8000 | 75% | 80% | 83% | 86% | 88% | 90% | 91% | 92% | 93% | 94% | 95% |
| 8500 | 68% | 72% | 76% | 79% | 82% | 84% | 85% | 87% | 88% | 89% | 90% |
| 9000 | 59% | 64% | 68% | 71% | 74% | 76% | 78% | 80% | 81% | 83% | 84% |
| 9500 | 51% | 55% | 59% | 62% | 65% | 67% | 69% | 71% | 72% | 74% | 75% |
| 9826 | 46% | 50% | 53% | 56% | 58% | 60% | 62% | 64% | 65% | 67% | 68% |
| 10000 | 43% | 47% | 49% | 52% | 54% | 57% | 59% | 60% | 62% | 64% | 65% |
| 10500 | 35% | 38% | 40% | 42% | 44% | 46% | 48% | 49% | 50% | 52% | 53% |
| 11000 | 29% | 31% | 32% | 33% | 35% | 36% | 37% | 38% | 39% | 40% | 40% |
| 11500 | 23% | 24% | 25% | 25% | 26% | 27% | 27% | 28% | 28% | 29% | 29% |
| 12000 | 18% | 18% | 19% | 19% | 19% | 19% | 19% | 20% | 20% | 20% | 20% |
| 12500 | 13% | 14% | 14% | 14% | 14% | 14% | 14% | 13% | 13% | 13% | 13% |
| 13000 | 11% | 10% | 10% | 10% | 10% | 10% | 9% | 9% | 9% | 9% | 9% |
| 13500 | 8% | 8% | 7% | 7% | 7% | 6% | 6% | 6% | 6% | 6% | 5% |
| 14000 | 6% | 6% | 5% | 5% | 5% | 4% | 4% | 4% | 4% | 3% | 3% |
| 14500 | 5% | 4% | 4% | 3% | 3% | 3% | 3% | 2% | 2% | 2% | 2% |
| 15000 | 4% | 3% | 3% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% |

Probability B>=B$_{MSY}$

| TAC (t) | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 21% | 48% | 74% | 90% | 96% | 99% | 99% | 100% | 100% | 100% | 100% |
| 6000 | 21% | 33% | 46% | 59% | 70% | 77% | 83% | 88% | 92% | 94% | 95% |
| 6500 | 21% | 32% | 44% | 56% | 66% | 74% | 80% | 85% | 88% | 91% | 93% |
| 7000 | 21% | 31% | 41% | 52% | 62% | 70% | 75% | 80% | 85% | 88% | 90% |
| 7500 | 21% | 30% | 39% | 48% | 57% | 65% | 70% | 76% | 80% | 83% | 86% |
| 8000 | 21% | 29% | 37% | 45% | 53% | 60% | 65% | 70% | 74% | 78% | 81% |
| 8500 | 21% | 28% | 34% | 41% | 48% | 54% | 59% | 64% | 68% | 72% | 75% |
| 9000 | 21% | 27% | 32% | 38% | 44% | 49% | 53% | 58% | 61% | 65% | 68% |
| 9500 | 21% | 26% | 31% | 35% | 39% | 44% | 48% | 51% | 55% | 58% | 60% |
| 9826 | 21% | 25% | 29% | 33% | 36% | 40% | 43% | 47% | 50% | 52% | 55% |
| 10000 | 21% | 25% | 29% | 32% | 35% | 39% | 41% | 45% | 47% | 49% | 52% |
| 10500 | 21% | 24% | 27% | 29% | 31% | 34% | 36% | 38% | 40% | 41% | 43% |
| 11000 | 21% | 23% | 25% | 26% | 28% | 29% | 30% | 32% | 33% | 34% | 35% |
| 11500 | 21% | 22% | 23% | 24% | 24% | 25% | 25% | 26% | 26% | 27% | 27% |
| 12000 | 21% | 21% | 21% | 21% | 21% | 21% | 21% | 21% | 21% | 21% | 21% |
| 12500 | 21% | 20% | 19% | 19% | 18% | 18% | 17% | 17% | 16% | 16% | 16% |
| 13000 | 21% | 19% | 18% | 17% | 16% | 15% | 14% | 13% | 13% | 12% | 12% |
| 13500 | 21% | 18% | 17% | 15% | 14% | 12% | 11% | 10% | 10% | 9% | 9% |
| 14000 | 21% | 18% | 15% | 13% | 12% | 10% | 9% | 8% | 7% | 7% | 6% |
| 14500 | 21% | 17% | 14% | 12% | 10% | 8% | 7% | 6% | 6% | 5% | 4% |
| 15000 | 21% | 16% | 13% | 10% | 8% | 7% | 6% | 5% | 4% | 3% | 3% |

Probability F<=F$_{MSY}$ and B>=B$_{MSY}$

| TAC (t) | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 21% | 48% | 74% | 90% | 96% | 99% | 99% | 100% | 100% | 100% | 100% |
| 6000 | 21% | 33% | 46% | 59% | 70% | 77% | 83% | 88% | 92% | 94% | 95% |
| 6500 | 21% | 32% | 44% | 56% | 66% | 74% | 80% | 85% | 88% | 91% | 93% |
| 7000 | 21% | 31% | 41% | 52% | 62% | 70% | 75% | 80% | 85% | 88% | 90% |
| 7500 | 21% | 30% | 39% | 48% | 57% | 65% | 70% | 76% | 80% | 83% | 86% |
| 8000 | 21% | 29% | 37% | 45% | 53% | 60% | 65% | 70% | 74% | 78% | 81% |
| 8500 | 21% | 28% | 34% | 41% | 48% | 54% | 59% | 64% | 68% | 72% | 75% |
| 9000 | 21% | 27% | 32% | 38% | 44% | 49% | 53% | 58% | 61% | 65% | 68% |
| 9500 | 21% | 26% | 31% | 35% | 39% | 44% | 48% | 51% | 55% | 58% | 60% |
| 9826 | 21% | 25% | 29% | 33% | 36% | 40% | 43% | 47% | 50% | 52% | 55% |
| 10000 | 20% | 25% | 28% | 32% | 35% | 39% | 41% | 45% | 47% | 49% | 52% |
| 10500 | 20% | 23% | 26% | 29% | 31% | 33% | 35% | 38% | 40% | 41% | 43% |
| 11000 | 20% | 22% | 24% | 25% | 27% | 28% | 30% | 31% | 32% | 33% | 35% |
| 11500 | 18% | 19% | 21% | 22% | 23% | 23% | 24% | 24% | 25% | 26% | 26% |
| 12000 | 16% | 16% | 17% | 18% | 18% | 18% | 18% | 18% | 19% | 19% | 19% |
| 12500 | 13% | 13% | 13% | 13% | 13% | 13% | 13% | 13% | 13% | 13% | 13% |
| 13000 | 10% | 10% | 10% | 10% | 9% | 9% | 9% | 9% | 9% | 9% | 8% |
| 13500 | 8% | 8% | 7% | 7% | 7% | 6% | 6% | 6% | 6% | 5% | 5% |
| 14000 | 6% | 6% | 5% | 5% | 5% | 4% | 4% | 4% | 4% | 3% | 3% |
| 14500 | 5% | 4% | 4% | 3% | 3% | 3% | 3% | 2% | 2% | 2% | 2% |
| 15000 | 4% | 3% | 3% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% |

a. SWO (1970-79)

b. SWO (1980-89)

c. SWO (1990-99)

d. SWO (2000-09)

e. SWO (2010-19)

f. SWO (2020-21)
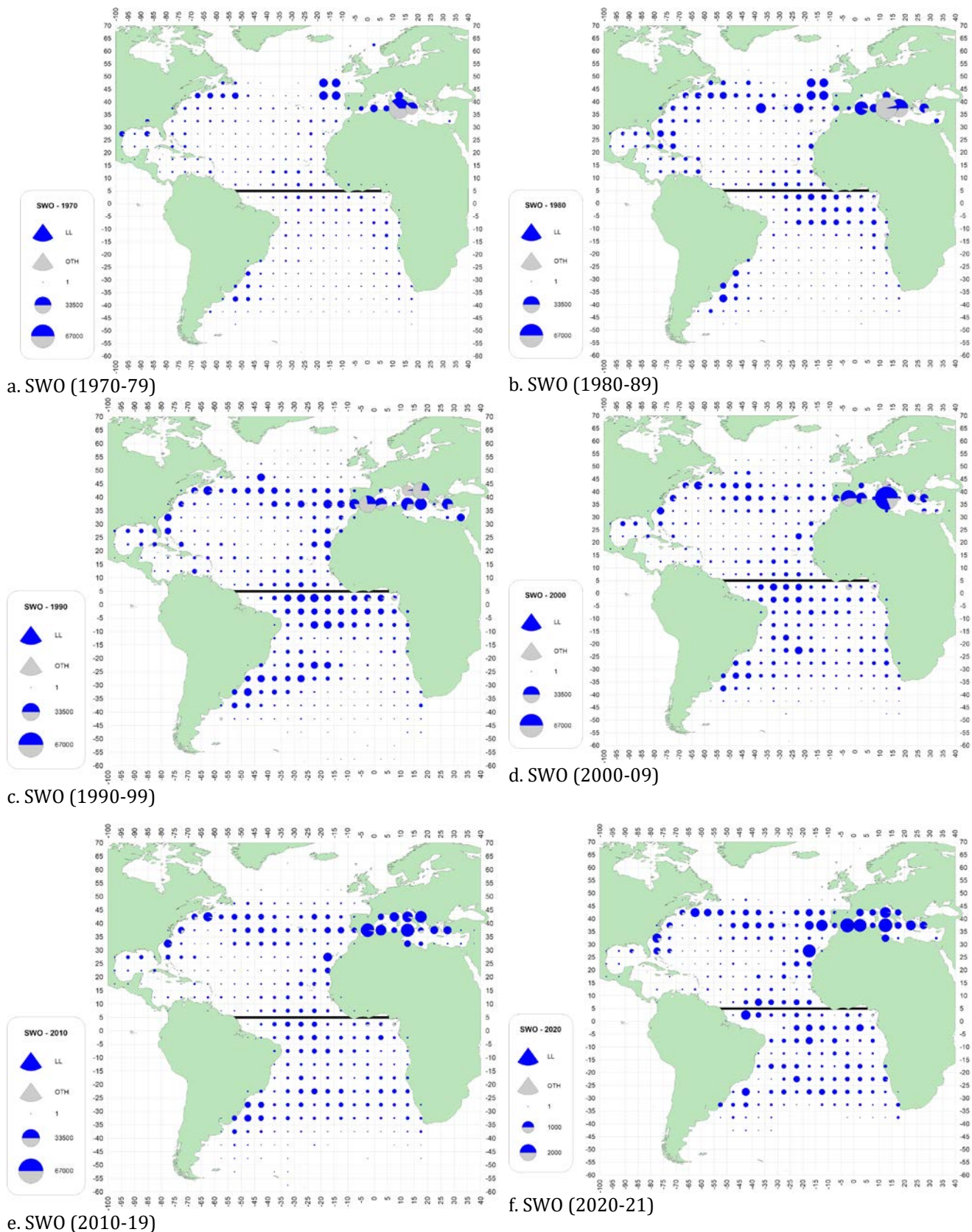
**SWO-AT-Figure 1.** Geographic distribution of swordfish cumulative catch (t) by gear, in the Convention area, shown on a decadal scale. The maps are scaled to the maximum catch observed during 1970-2021 (the last decade only covers 2 years).
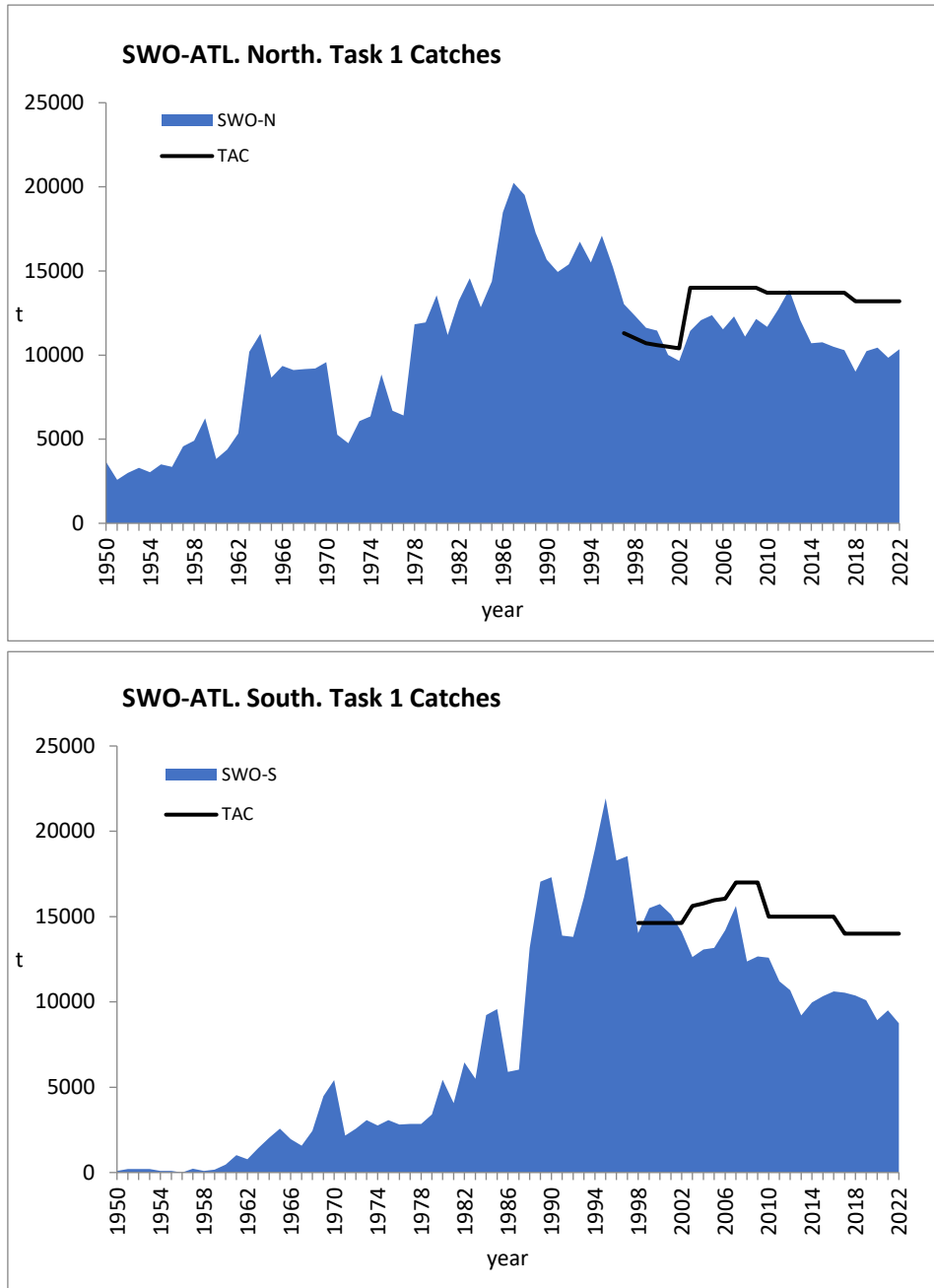
**SWO-AT-Figure 2.** North (top) and South (bottom) Atlantic swordfish catches (t, landings and dead discards) and TAC (t), for the period 1950-2022.
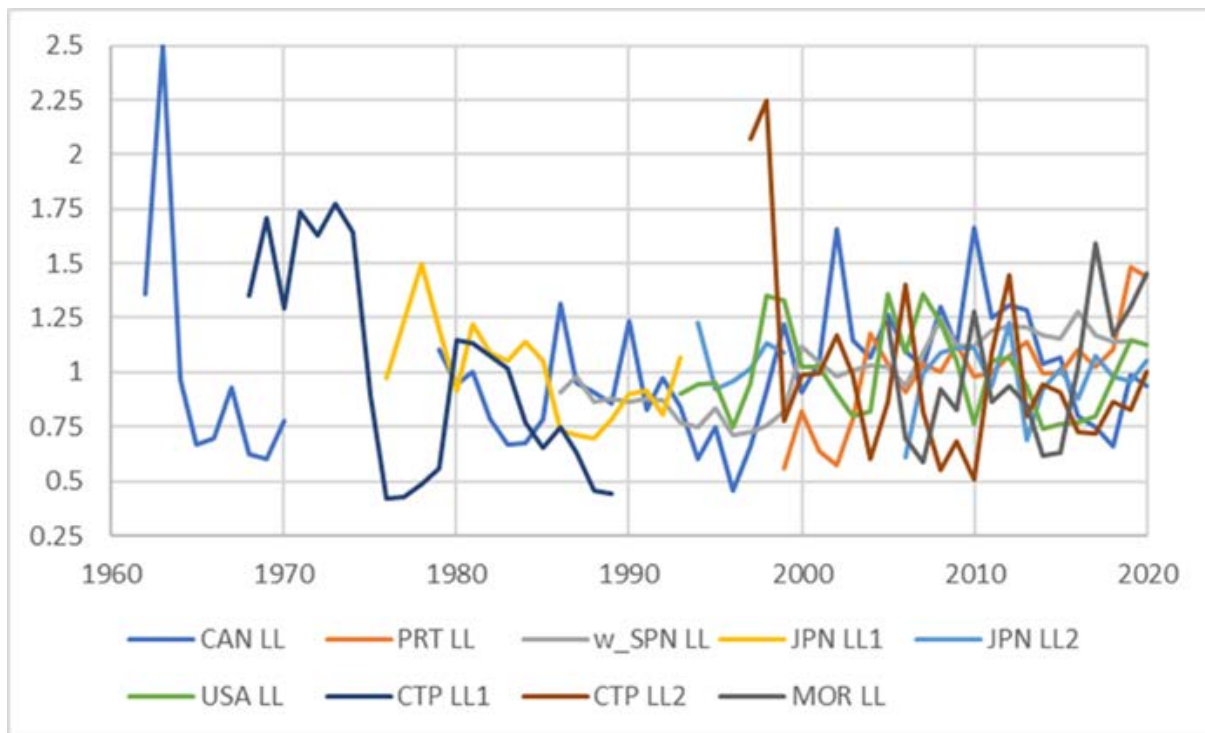
**SWO-AT-Figure 3.** Standardized CPUEs series provided by CPCs for the North Atlantic swordfish for the base continuity production model. The CPUE series were scaled to their mean for comparison purposes.
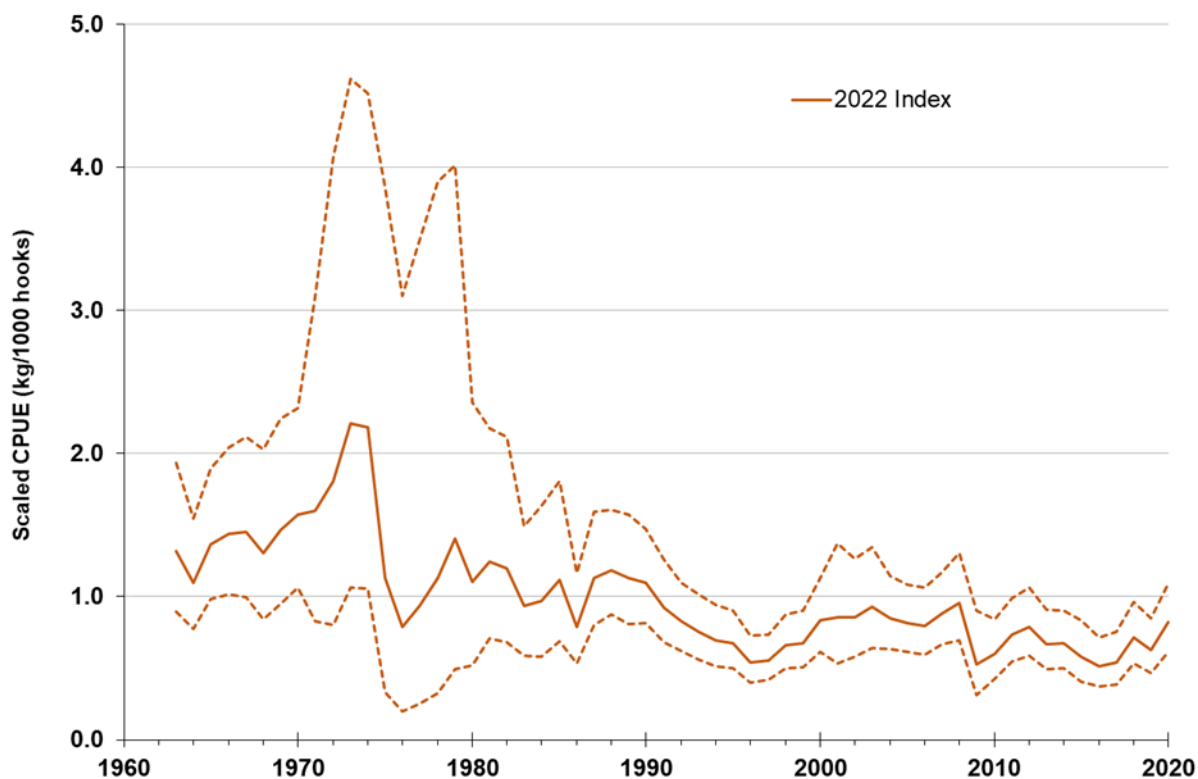


**SWO-AT-Figure 4**. Standardized combined biomass CPUE index for North Atlantic and 95% confidence intervals, used as the continuity run for the production models.
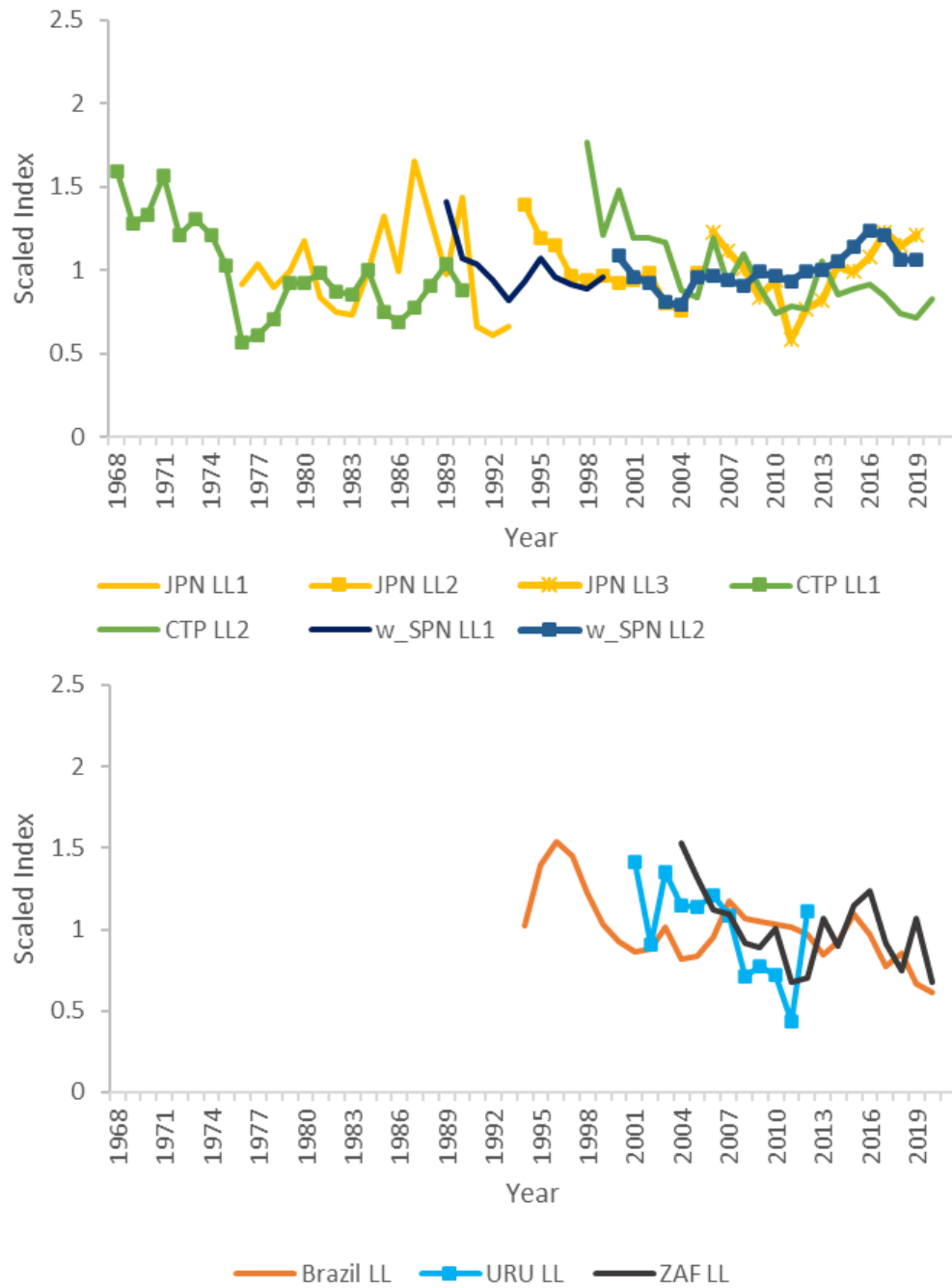
**SWO-AT-Figure 5.** Standardized CPUEs series for that were used in the assessment of the South Atlantic swordfish. Indices that were split (JPN, EU-SPN and CTP) are shown on the top, and the rest (BRA, URU and ZAF) are shown at the bottom. The CPUE series were scaled to their mean for comparison purposes.
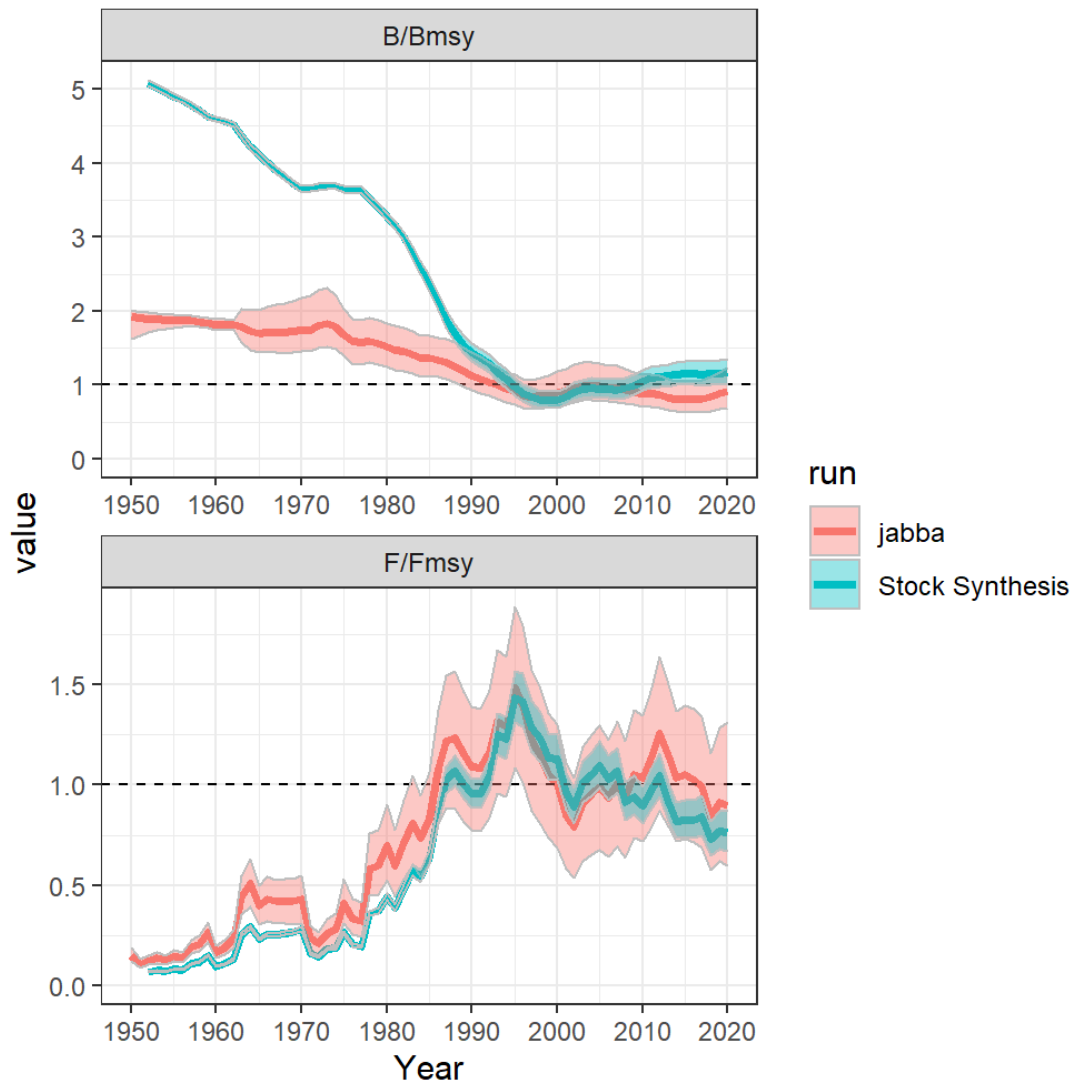
**SWO-AT-Figure 6.** Results from the two models used for management advice in the North Atlantic swordfish assessment: JABBA and Stock Synthesis. Trends in relative biomass (top) and fishing mortality (bottom). Uncertainty intervals are approximations of 95% credibility intervals.
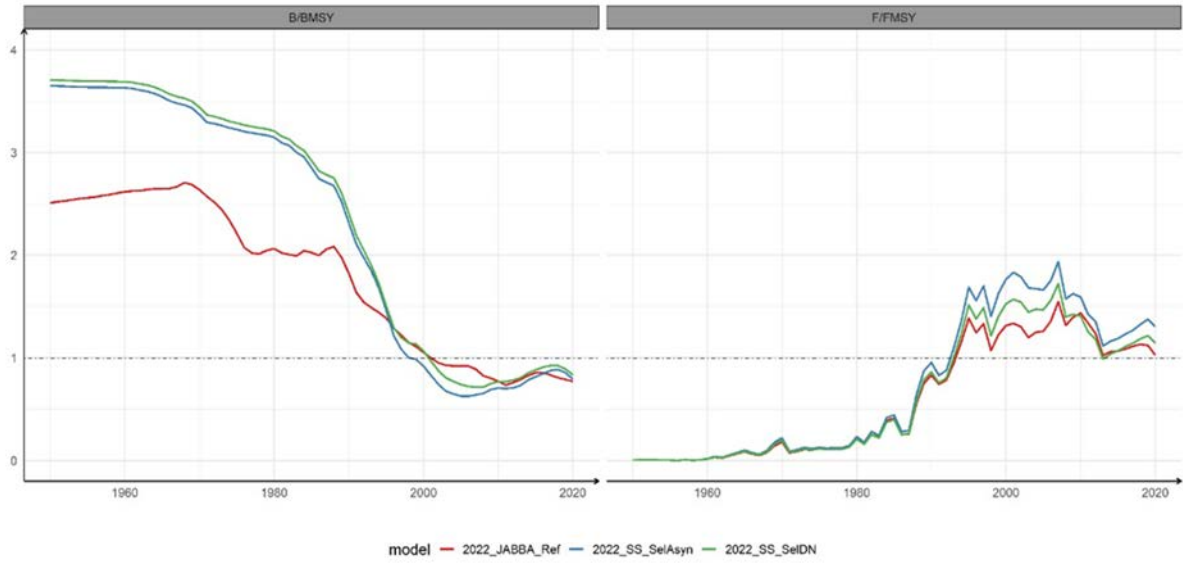
**SWO-AT-Figure 7.** Comparisons of $B/B_{MSY}$ and $F/F_{MSY}$ between JABBA base case and two SS runs for the South Atlantic swordfish stock.
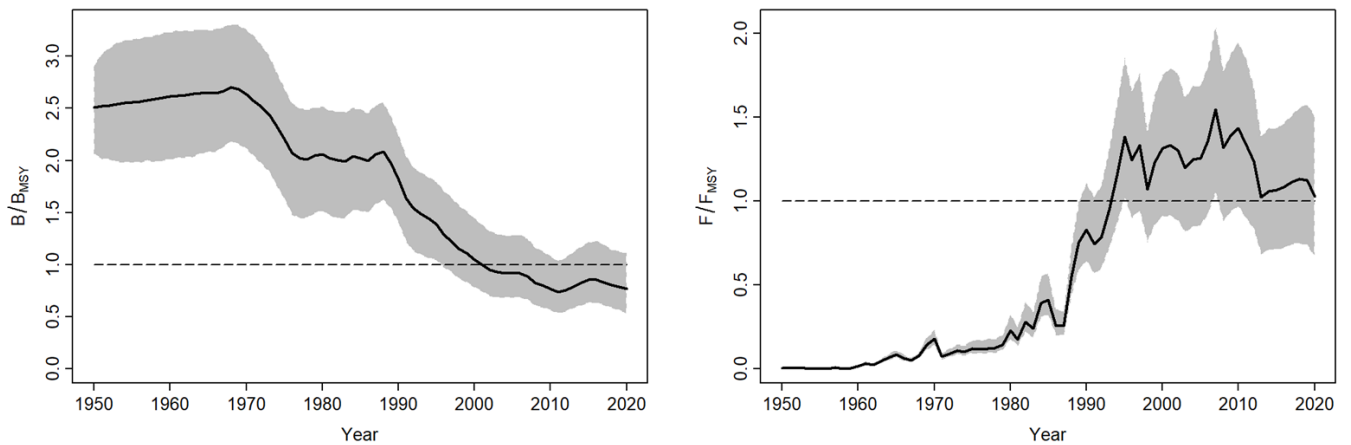


**SWO-AT-Figure 8.** South Atlantic swordfish biomass and fishing mortality rates relative to MSY levels, from the JABBA base case model. Grey areas represent 95% credibility intervals.
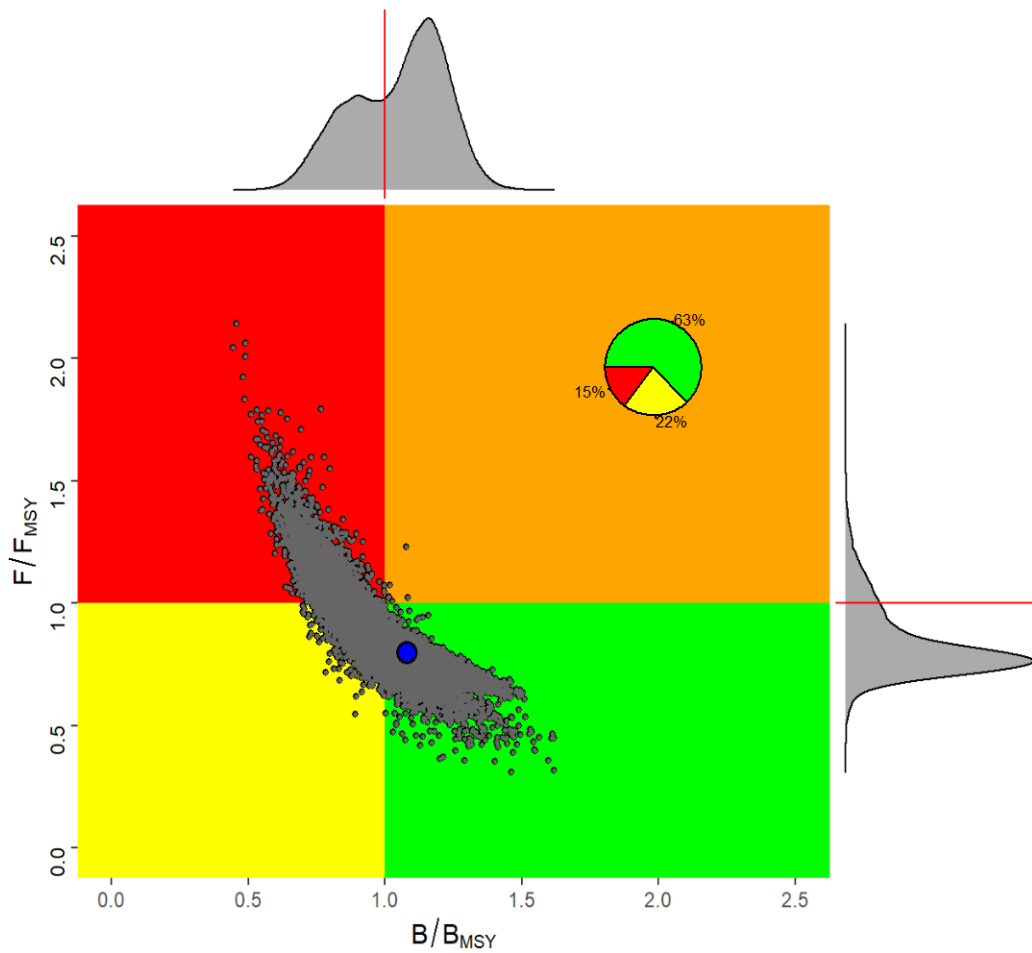
**SWO-AT-Figure 9.** Joint Kobe plot for the Stock Synthesis and the JABBA reference case models for the North Atlantic swordfish stock. For the Stock Synthesis run, the benchmark is calculated from the year-specific selectivity and fleet allocations and based on 15000 MVLN iterations for Stock Synthesis and 15000 MCMC iterations for JABBA. The blue point shows the median of 30,000 iterations for $SSB_{2020}/SSB_{MSY}$ or $B_{2020}/B_{MSY}$ and $F_{2020}/F_{MSY}$ for the entire iterations from Stock Synthesis and JABBA. Grey points represent the 2020 estimates of relative fishing mortality and relative spawning stock biomass for 2020 for each of the 30,000 iterations. The upper graph represents the smoothed frequency distribution of $SSB_{2020}/SSB_{MSY}$ or $B_{2020}/B_{MSY}$ estimates. The right graph represents the smoothed frequency distribution of $F_{2020}/F_{MSY}$ estimates. The inserted pie graph represents the percentage of each 2020 estimate that fall in each quadrant of the Kobe plot. All SSB for Stock Synthesis showed the values at the end of years. The blue dot is the median of the 2020 stock status.
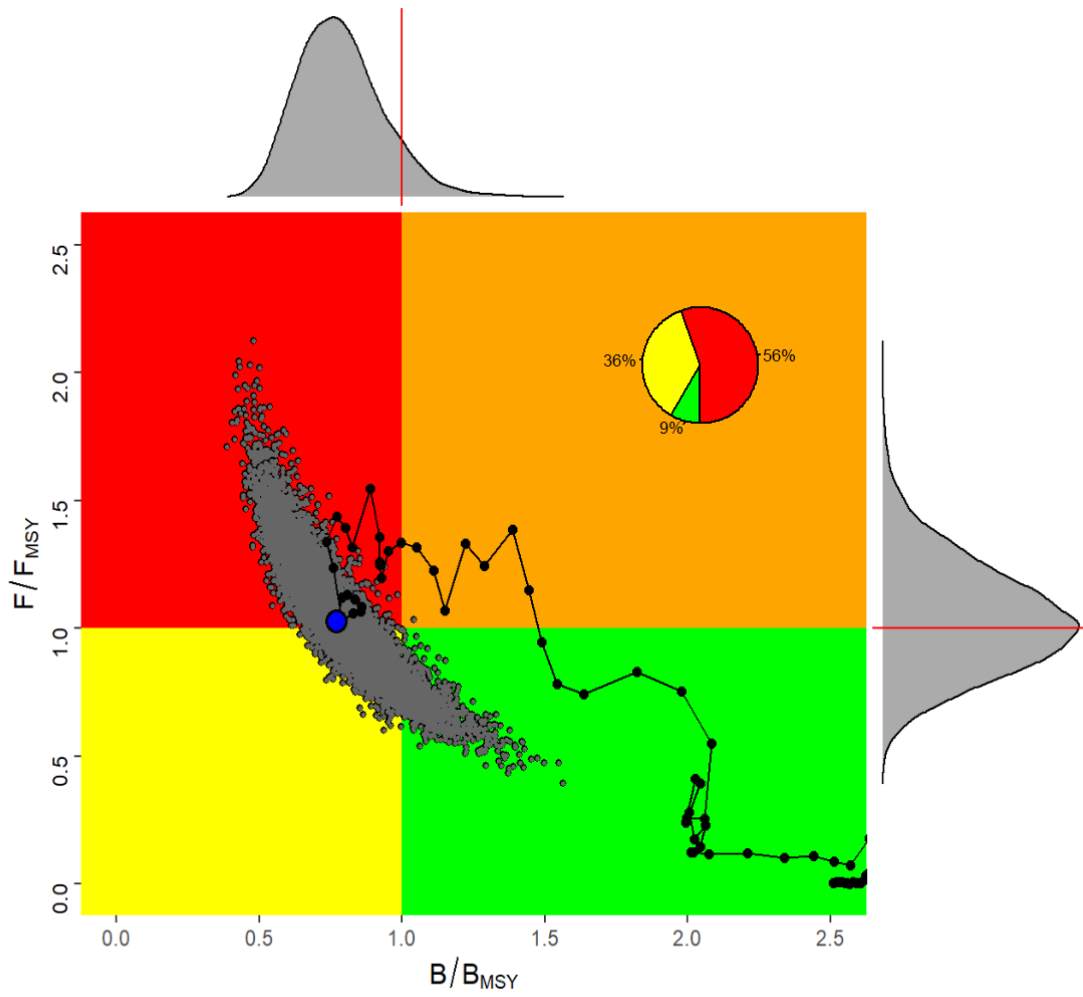
**SWO-AT-Figure 10.** Kobe plot for the JABBA reference base case model for southern Atlantic swordfish. The solid blue circle is the estimated median point with the respective uncertainties in the terminal year (2020). The pie chart represents the probabilities of stock being in the different colour quadrants (red 56%, yellow 36%, green 9%). The blue dot represents the 2020 stock status.
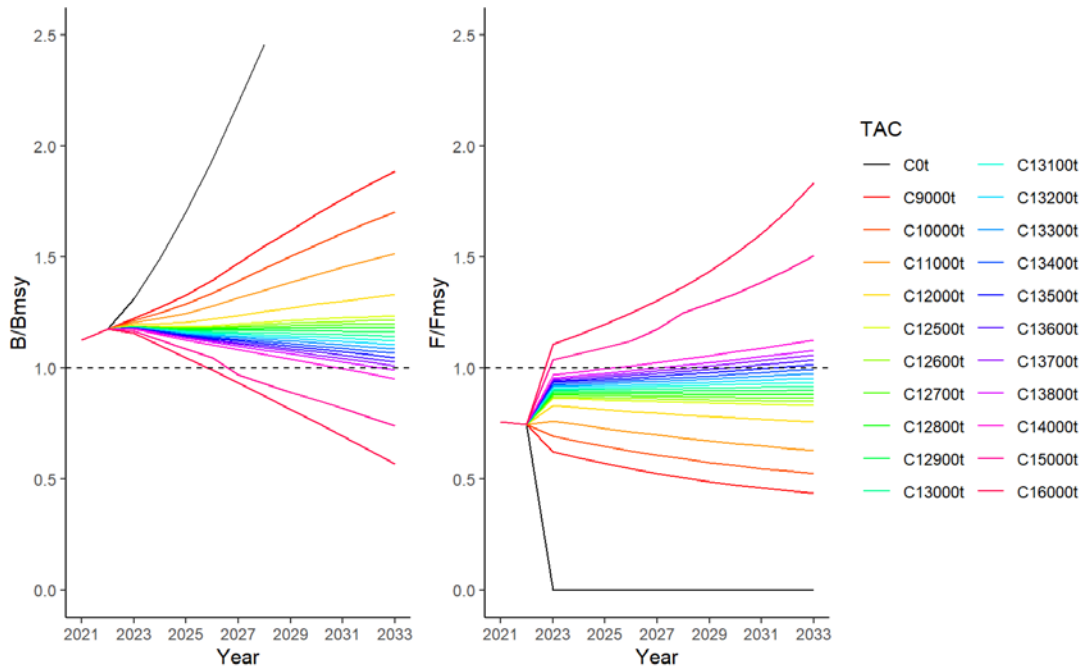
**SWO-AT-Figure 11.** Joint projections from Stock Synthesis and JABBA of biomass (or spawning stock biomass) at 0, 9-16 thousand t constant TACs for the North Atlantic swordfish stock for the period 2023-2033.
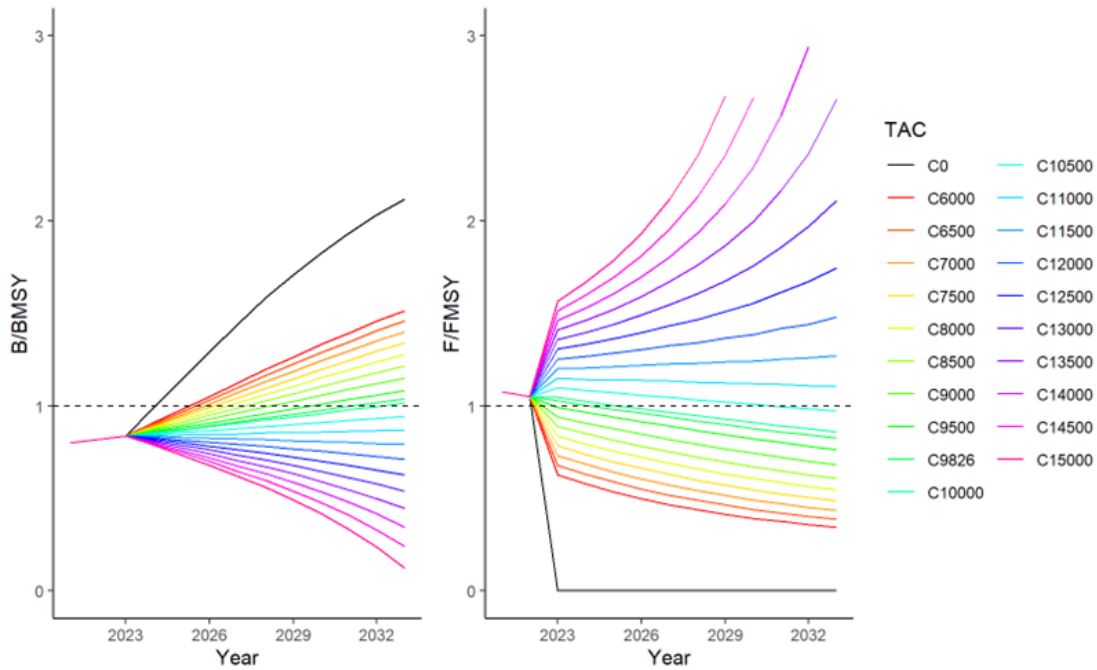


**SWO-AT-Figure 12.** Median trends of relative biomass (B/B$_{MSY}$) for the projected South Atlantic swordfish stock derived from the JABBA base case model at 0, 6-15 thousand t constant TACs for the period 2023-2033.
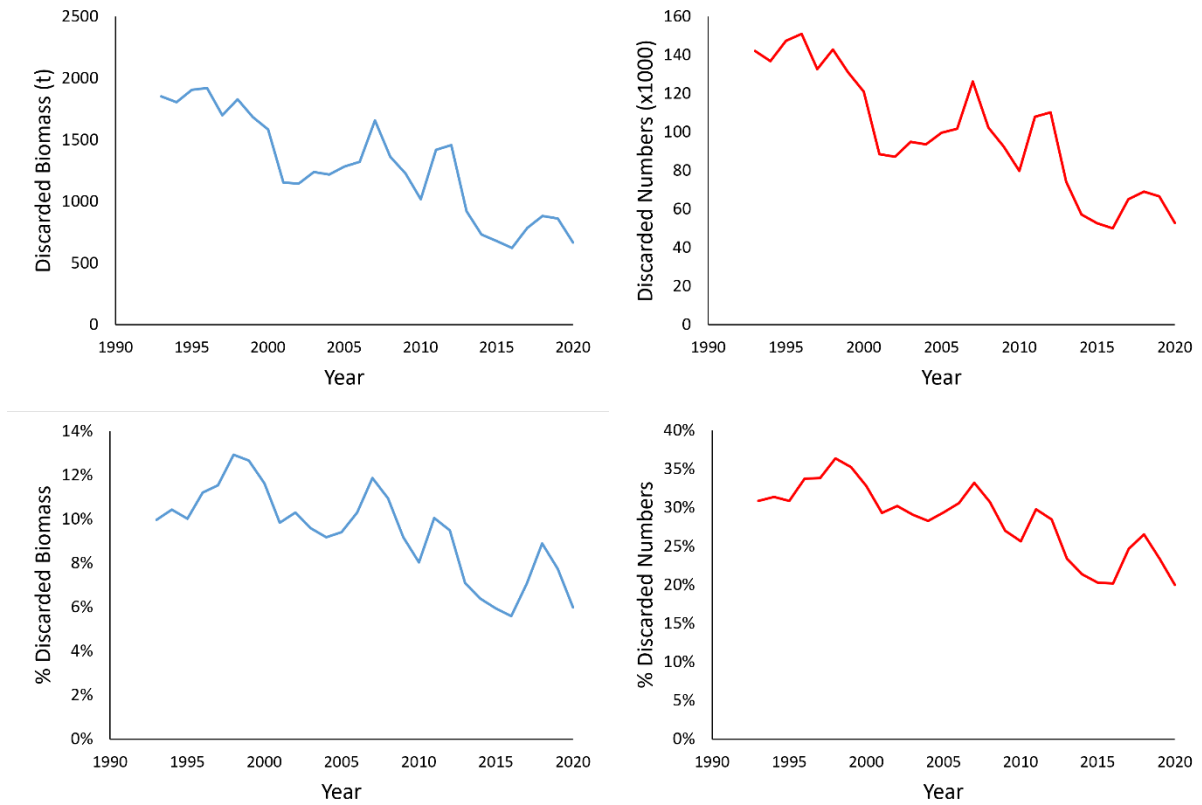
**SWO-AT-Figure 13.** Estimated total discards due to the minimum size regulation in absolute biomass and numbers (top row) and in biomass and numbers as a proportion of the catch (bottom row) for years 1992 to 2020, as estimated by Stock Synthesis.
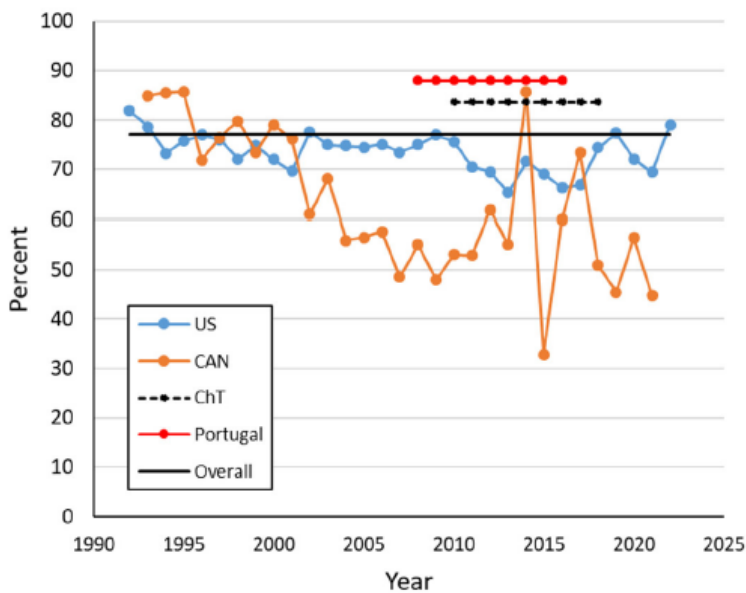


**SWO-AT-Figure 14.** Direct observations of at-haulback mortality of fish below the minimum size limit in four longline fleets operating in the North Atlantic.