

9.4 ALB-AT - Atlantic albacore

The status of the North Atlantic albacore stock is based on the analyses conducted in June 2023 with available data up to 2021. Complete information on the assessment can be found in the Report of the 2023 Atlantic Albacore Stock Assessment Meeting (including MSE) (ICCAT, 2023a).

The status of the South Atlantic albacore stock is based on the analyses conducted in July 2020 with available data up to 2018. Complete information on the assessment can be found in the Report of the 2020 Atlantic Albacore Stock Assessment Meeting (ICCAT, 2020a).

ALB-AT-1. Biology

Albacore is a temperate tuna widely distributed throughout the Atlantic Ocean and Mediterranean Sea. On the basis of the biological information available for assessment purposes, the existence of three stocks is assumed: northern and southern Atlantic stocks (separated at 5°N) and a Mediterranean stock (ALB-AT-Figure 1). However, some studies support the hypothesis that various sub populations of albacore exist in the North Atlantic and Mediterranean. Likewise, there is likely intermingling of Indian Ocean and South Atlantic immature albacore which needs further research.

Scientific studies on albacore stocks, in the North Atlantic, North Pacific and the Mediterranean, suggest that environmental variability may have a serious potential impact on albacore stocks, affecting fisheries by changing the fishing grounds, as well as productivity levels and potential MSY of the stocks. Those yet sufficiently unexplored aspects might explain recently observed changes in fisheries, such as the lack of availability of the resource in the Bay of Biscay in some years, which are demanding focussed research. The magnitude and direction of Climate Change effects on productivity of Atlantic albacore are uncertain.

The expected life-span for albacore is around 15 years. While albacore is a temperate species, spawning in the Atlantic occurs in tropical waters. Present available knowledge on habitat, distribution, spawning areas and maturity of Atlantic albacore is based on limited studies, mostly from past decades. In 2023 a new age specific natural mortality vector was adopted by the Committee.

More information on albacore biology and ecology is published in the [ICCAT Manual](#).

ALB-AT-2. Description of fisheries or fishery indicators

North Atlantic

The northern stock is exploited by surface fisheries targeting mainly immature and sub-adult fish (50 cm to 90 cm FL) and longline fisheries targeting immature and adult albacore (60 cm to 130 cm FL). The main surface fisheries are carried out by EU fleets (Ireland, France, Portugal and Spain) in the Bay of Biscay, in the adjacent waters of the Northeast Atlantic, including the Azores Islands in summer and autumn, and in the vicinity of the Canary Islands year around. The main longline fleet is the Chinese Taipei fleet which operates in the central and western North Atlantic year around. However, Chinese Taipei fishing effort decreased in the late 1980s due to a shift towards targeting tropical tunas, and then continued at this lower level to the present. Over time, the relative contribution of different fleets to the total catch of North Atlantic albacore has changed, which resulted in differential effects on the age structure of the stock. Since the 1980s, a reduction of the area fished for albacore was observed for both longline and surface fisheries.

Total reported landings, steadily increased since 1930 to peak above 60,000 t in the early 1960s, declining afterwards, largely due to a reduction of fishing effort by the traditional surface (troll and baitboat) and longline fisheries (ALB-AT-Table 1; ALB-AT-Figure 2). Some stabilization was observed in the 1990s and early 2000s, mainly due to increased effort and catch by new surface fisheries (driftnet and mid-water pair pelagic trawl). The lowest catch level of the time series starting in 1950 was observed in 2009 with 15,391 t, but catches have substantially increased since then and have fluctuated around the TAC in the last few years.

The preliminary total reported catch in 2023 was 28,212 t (below the TAC of 37,801 t), and the catch in the last five years has remained slightly above 30,000 t. During the last years, the surface fisheries (mainly by EU-Spain, EU-Ireland and EU-France) contributed to approximately 84% of the total catch (**ALB-AT-Table 1**). Longline catch contributed to approximately 16% of the total catch during the last five years. During the last decades, both Chinese Taipei and Japan have reduced their fishing effort directed to albacore. In the case of Japan, albacore was taken mainly as bycatch.

South Atlantic

During the last decades, the total annual South Atlantic albacore landings were largely attributed to five fisheries, namely the surface baitboat fleets of South Africa and Namibia, and the longline fleets of Chinese Taipei, Brazil and Japan (**ALB-AT-Table 1; ALB-AT-Figure 2**). The surface fleets are albacore directed and mainly catch sub-adult fish (70 cm to 90 cm FL). These surface fisheries operate seasonally, from October to May, when albacore is available in coastal waters. The longline Chinese Taipei fleet operates over a larger area and throughout the year, consisting of vessels that target albacore and vessels that take albacore as bycatch, in bigeye directed fishing operations. On average, the longline vessels catch larger albacore (60 cm to 120 cm FL) than the surface fleets.

Albacore landings increased sharply since the mid-1950s to reach values oscillating around 25,000 t between the mid-1960s and the 1980s, 35,000 t until the last decade when they oscillated around 20,000 t. However, total reported albacore landings for 2017 decreased to 13,825 t, which is among the lowest values in the time series. The preliminary total reported catch in 2023 was 22,075 t, mostly by longlines and baitboats. The Chinese Taipei catch in the last years has decreased compared to historical catches, mainly due to a decrease in fishing effort targeting albacore. During the last decades, Japan took albacore as bycatch using longline gear, but recently Japan is again targeting albacore and increased the fishing effort in waters off South Africa and Namibia (20°-40°S). Thus, catches during the last decade have substantially increased compared to those in the last few decades.

ALB-AT-3. State of stocks

North Atlantic

In 2023 a thorough revision of North Atlantic Task 1 size and age data was conducted, and catch rates were updated with new information for the northern albacore fisheries up to and including data to 2021. In the stock assessment two model formulations with different degrees of complexity were used. In addition to the surplus production model that is part of the adopted Management Procedure (MP), a Stock Synthesis model was also used. The more complex stock synthesis model allowed to incorporate more detailed data and alternative hypotheses, compared to the surplus production model. Both models provided similar results and the Committee agreed to use the Stock Synthesis model to characterize stock status, as well as to verify that catch projections are consistent with the catch advice provided by the Management Procedure.

The five CPUE indices (four longline and one baitboat) specified in the MP were used in the production model (**ALB-AT-Figure 3**). These indices were further split into different areas for the Stock Synthesis model. Despite their variable pattern, these indices showed an overall increasing trend during the last decades.

The Stock Synthesis model results suggest a biomass drop between 1930 and the 1990s and a recovery since then, while fishing mortality decreases. Relative to MSY benchmarks, the base case scenario estimates that the stock remained slightly overfished with B below B_{MSY} between the late 1970s and the 2000s, but has now recovered to levels well above B_{MSY} (**ALB-AT-Figure 4**). Peak relative fishing mortality levels in the order of 1.66 times F_{MSY} were observed in the early 1980s but overfishing stopped in the early 2000s, with the current F_{2021}/F_{MSY} ratio being 0.45. There is large uncertainty around the current stock status estimated by the model. The probability of the stock currently being in the green area of the Kobe plot (not overfished and not undergoing overfishing, $F < F_{MSY}$ and $B > B_{MSY}$) is 99.6% while the probability of being in the yellow area (overfished, $B < B_{MSY}$) is 0.4%. The probability of being in the red area (overfished and undergoing overfishing, $F > F_{MSY}$ and $B < B_{MSY}$) is 0% (**ALB-AT-Figure 4**).

South Atlantic

In 2020, a stock assessment of South Atlantic albacore was conducted including catch and effort data up until 2018 and considering similar methods as in the previous assessment.

For the South Atlantic stock, the standardized CPUE indices are mainly based on longline fisheries, which catch mostly adult albacore. The same three longline CPUEs that were used in 2016 were also selected to update the 2020 stock assessment results. The longest time series of Chinese Taipei showed a strong declining trend in the early part of the time series followed by a less steep decline over the next three decades (similar to the Japanese longline index), and an increasing trend since the early 2000s. The Uruguayan longline CPUE series showed a decrease since the 1980s (**ALB-AT-Figure 5**). The Chinese Taipei CPUE was the only index that informed stock trends in recent years. In addition, standardized CPUE series from the Brazilian longline (2002-2018) and the South African baitboat fishery were made available, which were used for sensitivity analyses.

In the 2020 assessment the Committee selected a base case to best represent the population dynamics of albacore and uncertainty around stock status as well as impact of alternative fishing scenarios. Base case model results suggest that biomass increased since fishing mortality started to decrease in the early 2000s, and currently there is a 99.4% probability that the South Atlantic albacore stock is neither overfished nor subject to overfishing, with only 0.6% probability for the stock to be overfished. The median MSY value was 27,264 t (ranging between 23,734 t and 31,567 t), the median estimate of current B_{2018}/B_{MSY} was 1.58 (ranging between 1.14 and 2.05) and the median estimate of current F_{2018}/F_{MSY} was 0.40 (ranging between 0.28 and 0.59). The wide confidence intervals reflect the large uncertainty around the estimates of stock status (**ALB-AT-Figure 6**).

ALB-AT-4. Outlook*North Atlantic*

In 2021, the Commission adopted an MP that uses a production model and a Harvest Control Rule (HCR) to set TACs every three years ([Rec. 21-04](#)). MSE tests showed that this MP would meet the management objectives for this stock, i.e. to be in the green quadrant of the Kobe plot with a probability higher than 60%.

The current Management Procedure results in a TAC of 47,251 t for 2024-2026. This represents a 25% increase with respect to the previous one and is in line with the positive stock status estimated in the 2023 assessment. It is noted that this TAC for 2024-2026 is above the MSY estimate for this stock (41,995 t); this is because the current biomass is well above B_{MSY} ($B_{2021}/B_{MSY} = 2.19$), and therefore this level of catch can be sustained in the near term. Projections conducted by the Stock Synthesis model also supported that level of catch in the short term.

South Atlantic

The Kobe matrix indicates that catches around the MSY level of 27,000 t will maintain biomass levels above B_{MSY} and fishing mortality below F_{MSY} with a high probability of 90% over the projection horizon through 2033 (**ALB-AT-Table 2**). In fact, due to the current high stock biomass, catches of up to 30,000 t are expected to maintain stock levels above B_{MSY} until 2033 with a probability higher than 60%. However, it is important to note that these catch levels would exceed MSY and it would require a reduction in TAC after 2033 to prevent overfishing (**ALB-AT-Table 2**).

ALB-AT-5. Effect of current regulations*North Atlantic*

In 2021, the Commission adopted a model-based management procedure including the HCR described in **ALB-AT-Figure 7**, with a maximum TAC of 50,000 t and a maximum change of +25% -20% when $B_{CUR} > B_{THR}$. Its application established a TAC of 37,801 t for 2022-2023 ([Rec. 21-04](#)) and 47,251 t for 2024-2026 ([Rec. 23-05](#)), and the possibility to carry over some unused portions of the quotas to be caught later in time remained. The Committee noted that, since the establishment of the TAC in the year 2001, catch remained substantially below the TAC in all but four years (**ALB-AT-Figure 2**), which might have accelerated rebuilding over the last decades. The bulk of the catch is caught by traditional surface fisheries operating in the Bay of Biscay and surrounding waters. Thus, it is likely that the fluctuations in catches reflect the fluctuations in the availability of the resource to those local regional fisheries, and the carry-over allows to compensate the fleets for the years when the stock was less available.

Furthermore, [Rec. 98-08](#) that limits fishing capacity to the average of 1993-1995, remains in force. The effect of this Recommendation has not been evaluated but a general decrease of fishing mortality has been observed since its implementation.

South Atlantic

In 2022 the Commission established a new TAC of 28,000 t for 2023-2026 ([Rec. 22-06](#)). The Committee noted that reported catches remained below 28,000 t since 2004 (**ALB-AT-Table 1**). The Committee did not test for the effect of perfect implementation of the TAC since 2004.

ALB-AT-6. Management recommendations*North Atlantic*

[Recommendation 21-04](#) sets the management procedure to achieve the management objective of maintaining the stock in the green area of the Kobe plot with at least 60% probability while maximizing long-term yield.

In the 2023 assessment, the Committee noted that the relative abundance of North Atlantic albacore has continued to increase over the last two decades and the stock was estimated to be in the green area of the Kobe plot with > 99% probability. Considering that no exceptional circumstances (ECs) were detected that precluded the application of the MP, the Committee recommended applying the MP to the current biomass estimate (B_{2021} in the Summary Table below) to set the TAC for the 2024-2026 period. The recommended TAC obtained by applying the MP was 47,251 t, which represented a 25% increase with respect to the previous one.

In 2024, no exceptional circumstances were detected, thus the Committee recommends continuing the implementation of the TAC set with the management procedure (see section 19.7, response to [Rec. 21-04](#) para 4).

South Atlantic

Results indicate that, most probably, the South Atlantic albacore stock is not overfished and that overfishing is not occurring. Projections at a level consistent with the MSY (27,264 t) showed that probabilities of being in the green quadrant of the Kobe plot would remain very high (90%) by 2033. In fact, due to the current high stock biomass, catches of up to 30,000 t are expected to maintain stock levels above B_{MSY} until 2033 with a probability higher than 60%. However, it is important to note that these catch levels exceed MSY and it would require a reduction in TAC after 2033 to prevent overfishing (**ALB-AT-Table 2**).

ATLANTIC ALBACORE SUMMARY TABLE		
	North Atlantic ¹	South Atlantic
Maximum Sustainable Yield	41,995 t (38,860 - 45,130) ²	27,264 t (23,734 - 31,567) ²
Current (2023) Yield	28,212 t	22,075 t
Yield _{current} in last year of assessment ³	31,393 t	17,098 t
SSB _{MSY}	93,202 t (51,136 - 135,269) ²	124,453 t (79,611 - 223,424) ²
F _{MSY}	0.115 (0.092 - 0.141) ³	0.219 (0.116 - 0.356) ²
B ₂₀₂₁	519,799 t (462,465 - 608,819) ³	
SSB ₂₀₂₁ /SSB _{MSY}	2.19 (1.21 - 4.01) ²	
B ₂₀₁₈ /B _{MSY}		1.58 (1.14 - 2.05) ²
F _{current} /F _{MSY} ⁴	0.45 (0.29 - 0.71)	0.40 (0.28 - 0.59)
Stock Status	Overfished: NO Overfishing: NO	Overfished: NO Overfishing: NO
Management measures in effect:	Rec. 98-08: Limit number of vessels to 1993-1995 average. Rec. 23-05: TAC of 47,251 t for 2024-2026, according to MP. Management objective is to keep the stock in (or rebuild it to) the green area of the Kobe plot with at least 60% probability, while maximizing catch and reducing variability of TAC.	Rec. 22-06: TAC of 28,000 t for 2023-2026
Recommended TAC for the period 2024-2026 as estimated following the MP adopted in Rec. 21-04 ⁵	47,251 t	

¹ All values from the Stock Synthesis model, except for B₂₀₂₁ and F_{MSY}, which are used for TAC calculation, where values from the production model are shown.

² Mean (North Atlantic) or median (South Atlantic) and 95% CI for the reference/base case.

³ Median and 95% CI for the production model used for the MP iteration (Rec. 21-04).

⁴ Current year (the last year in the assessment) is 2021 for North Atlantic and 2018 for South Atlantic.

⁵ The recommended TAC is capped by the maximum allowed increase of 25%, since the TAC obtained when applying the MP equation resulted in a higher value (F_{TAR}*B_{CUR} = 47,673.9 t).

ALB-Table 1. Estimated catches (t) of albacore (*Thunnus alalunga*) by area, gear, and flag

[illegible]

		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	2023
RCC	USA	0	0	1	5	1	1	1	2	8	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Uruguay	16	49	75	56	110	90	90	135	111	108	120	32	23	34	33	97	24	37	12	209	0	0	0	0	0	0	0	0	0	0
	China-Taipei	2272	1833	18956	18163	16106	17272	17221	13533	17501	17511	13388	10720	12223	13146	9966	8678	10775	13333	12812	8319	6675	7117	8807	9380	9227	9526	9851	10019	8804	10897
	NCC	2	0	0	120	9	52	0	0	0	12	18	0	0	0	0	0	130	43	0	0	0	0	0	0	0	0	0	0	0	0
	Argentina	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Caribbean	1	10	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
	NEI (ETRO)	124	102	169	47	42	38	0	0	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	0
	Seychelles	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
	Yamalo	0	0	0	0	0	0	0	0	0	0	0	684	140	96	131	64	104	85	35	83	21	0	0	0	0	0	0	0	0	0
Discards	ATN	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
	CP	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-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	25	13
	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	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	1	0	0	0
	Korea Rep	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
	UE-Seychelles	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	93	179	209	300	302	160	151	32	121	0	17
	RCC	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
	CP	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
ATS	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-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
	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	37	11	4	8	26
	Korea Rep	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
	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
NCC	China-Taipei	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	0

ALB-AT-Table 2. South Atlantic albacore estimated probabilities (in %) based on Bayesian surplus production model that the stock fishing mortality is below F_{MSY} a), biomass is above B_{MSY} b) and both c). Projections for constant catch levels (16,000 t to 34,000 t) are shown.

a) Probability $F < F_{MSY}$.

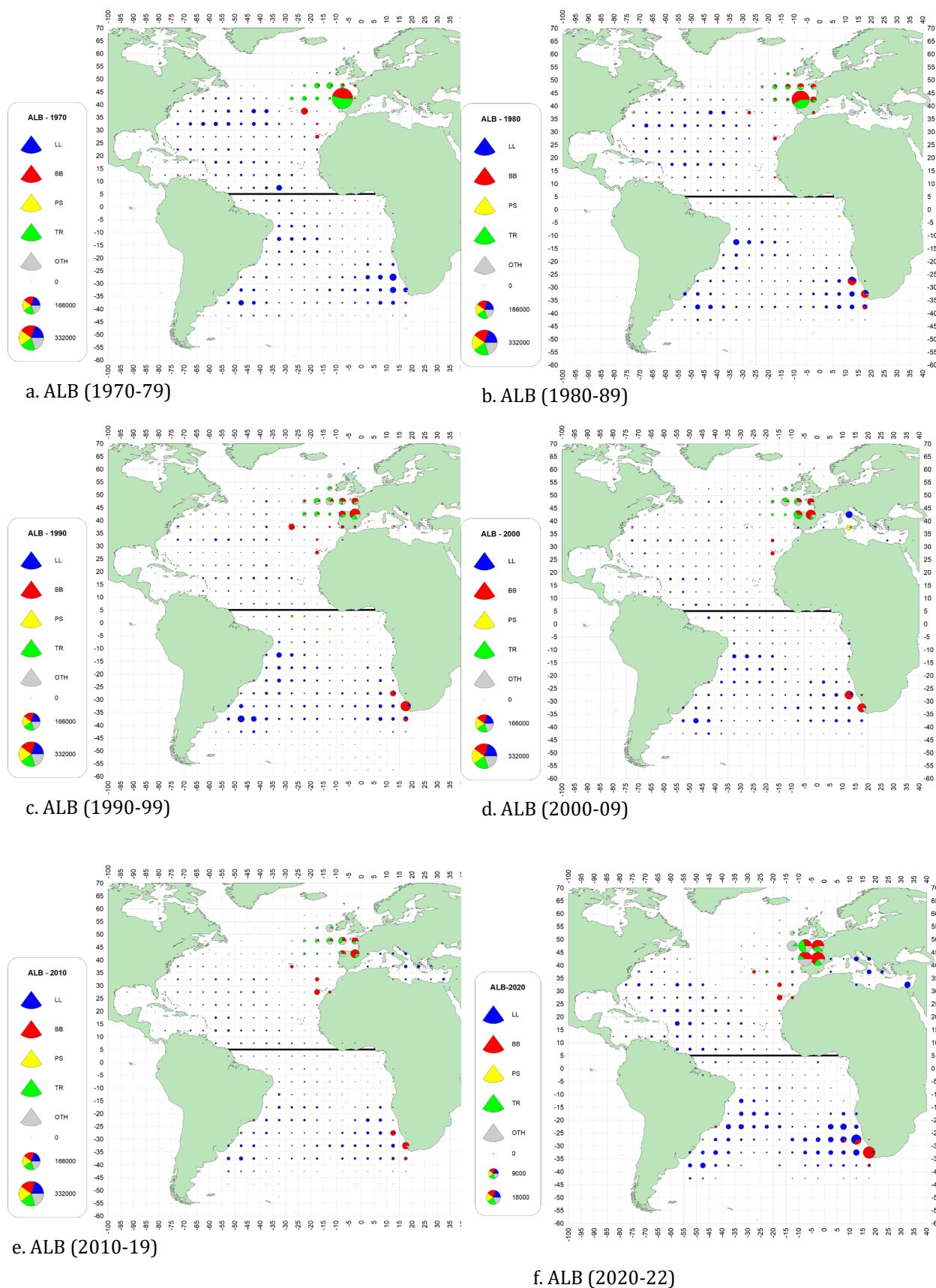
TAC Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
16000	100	100	100	100	100	100	100	100	100	100	100	100	100
18000	100	100	100	100	100	100	100	100	100	100	100	100	100
20000	100	100	100	100	100	100	100	100	100	100	100	100	100
21000	100	100	100	100	100	100	100	100	100	100	100	100	100
22000	100	100	100	100	100	100	100	100	100	100	99	99	99
23000	100	100	100	100	100	100	99	99	99	99	99	99	99
24000	100	100	100	99	99	99	99	99	99	99	99	98	98
25000	100	100	99	99	99	99	98	98	98	98	98	97	97
26000	99	99	99	99	98	98	98	97	97	96	95	95	94
27000	99	99	98	98	97	97	96	95	94	93	92	91	90
28000	99	98	98	97	96	95	93	92	91	89	87	86	84
29000	99	98	97	96	94	93	90	88	85	82	80	77	74
30000	98	97	96	94	91	89	85	81	78	73	70	65	62
32000	97	95	92	88	82	76	69	62	56	49	44	39	35
34000	95	91	85	77	67	57	48	40	32	27	22	19	16

b) Probability $B > B_{MSY}$.

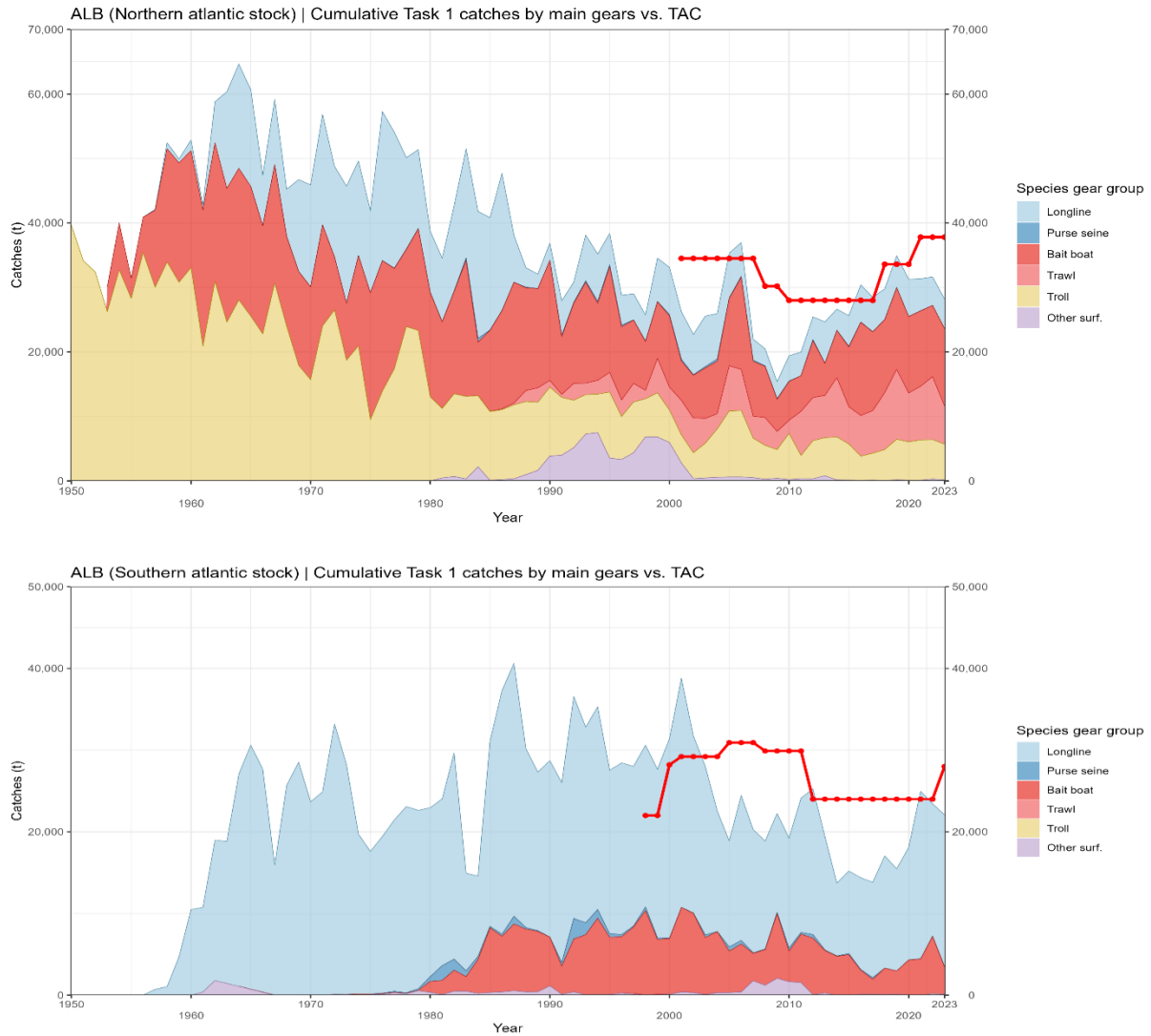
TAC Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
16000	100	100	100	100	100	100	100	100	100	100	100	100	100
18000	100	100	100	100	100	100	100	100	100	100	100	100	100
20000	100	100	100	100	100	100	100	100	100	100	100	100	100
21000	100	100	100	99	99	99	99	99	99	99	99	99	99
22000	100	100	100	99	99	99	99	99	99	99	99	99	99
23000	100	100	100	99	99	99	99	99	99	99	99	99	98
24000	100	99	99	99	99	99	99	99	98	98	98	98	98
25000	100	100	99	99	99	99	98	98	98	98	97	97	97
26000	100	99	99	99	99	99	98	98	97	97	96	95	95
27000	100	99	99	99	98	98	97	97	96	95	94	93	92
28000	100	99	99	99	98	97	96	95	94	93	91	90	88
29000	100	99	99	98	98	97	96	94	92	90	88	85	83
30000	100	99	99	98	97	96	94	92	89	86	83	79	76
32000	100	99	99	98	96	93	89	85	80	74	68	62	56
34000	100	99	98	96	93	89	82	75	66	58	49	42	36

c) Probability of green status ($B > B_{MSY}$ and $F < F_{MSY}$).

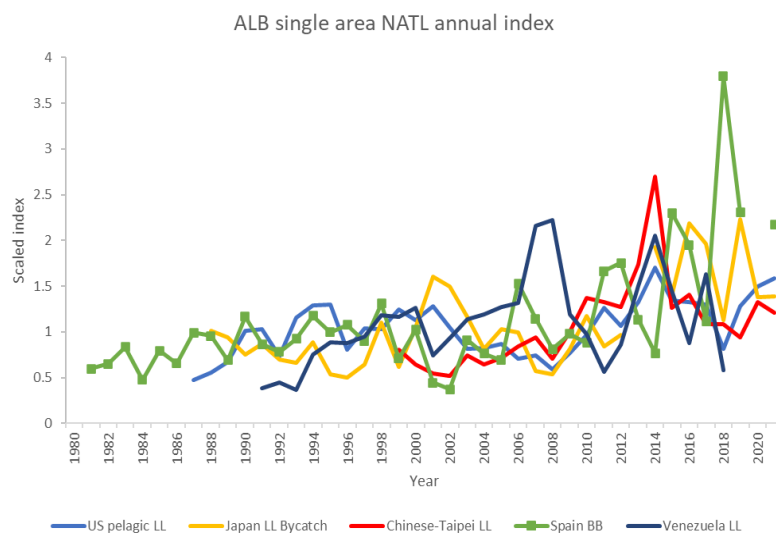
TAC Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
16000	100	100	100	100	100	100	100	100	100	100	100	100	100
18000	100	100	100	100	100	100	100	100	100	100	100	100	100
20000	100	100	100	100	100	100	100	100	100	100	100	100	100
21000	100	100	100	99	99	99	99	99	99	99	99	99	99
22000	100	100	100	99	99	99	99	99	99	99	99	99	99
23000	100	100	99	99	99	99	99	99	99	99	99	98	98
24000	100	99	99	99	99	99	99	98	98	98	98	98	98
25000	100	99	99	99	99	98	98	98	98	97	97	97	96
26000	99	99	99	98	98	98	97	97	96	96	95	94	94
27000	99	99	98	98	97	97	96	95	94	93	92	91	90
28000	99	98	98	97	96	95	93	92	90	89	87	85	83
29000	99	98	97	96	94	93	90	88	85	82	79	77	74
30000	98	97	96	94	91	89	85	81	78	73	69	65	61
32000	97	95	92	88	82	76	69	62	56	49	44	39	35
34000	95	91	85	77	67	57	48	40	32	27	22	19	16



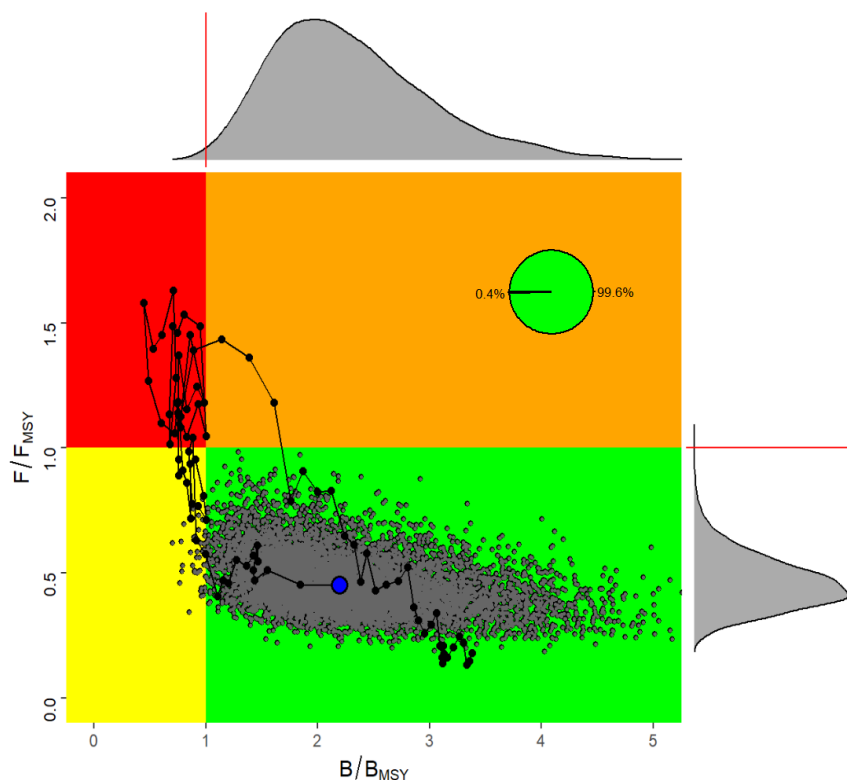
ALB-AT-Figure 1. Geographic distribution of albacore accumulated catch by major gears and decade (1970-2022). Baitboat and troll catches prior to the 1990s, these catches were assigned to only one 5°x5° stratum in the Bay of Biscay. Plots are scaled to the maximum catch observed from 1970 to 2022 (last decade only covers 3 years).



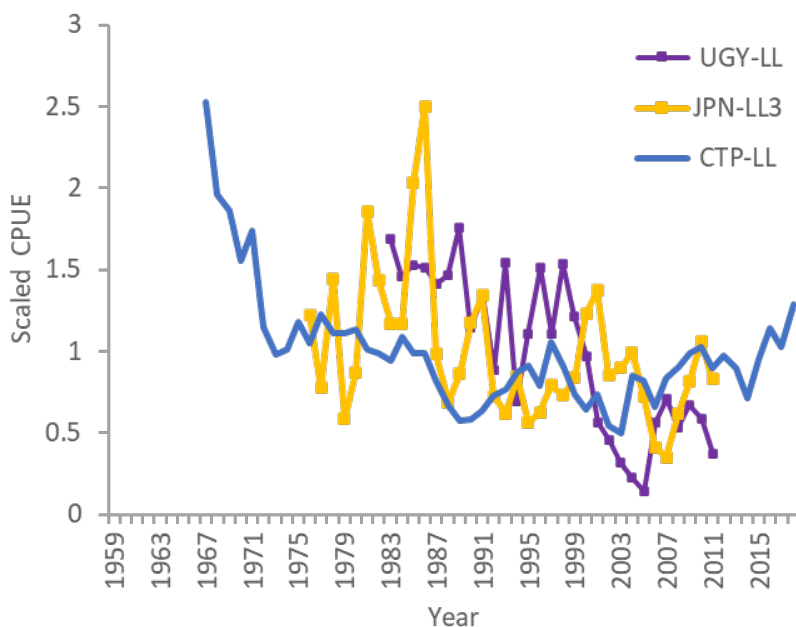
ALB-AT-Figure 2. Total albacore catches reported to ICCAT (Task 1) by gear for the northern (top) and southern (bottom) Atlantic stocks including TAC (red dotted line).



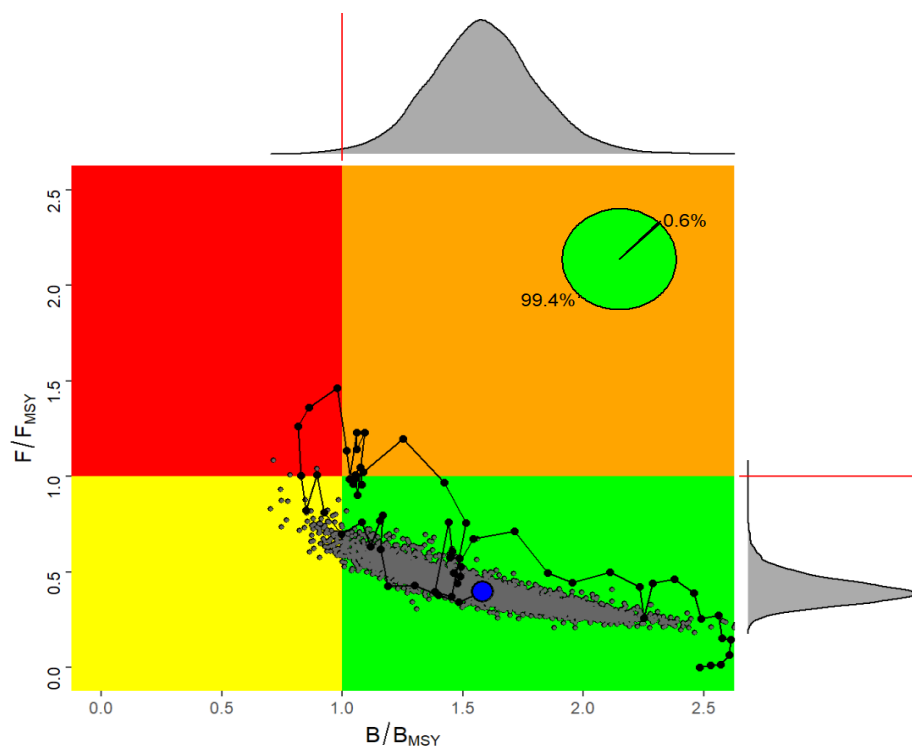
ALB-AT-Figure 3. North Atlantic albacore. Standardized catch rate indices used in the 2023 stock assessment from the surface fishery (baitboat) which take mostly juvenile fish, and from the longline fisheries which take mostly adult fish.



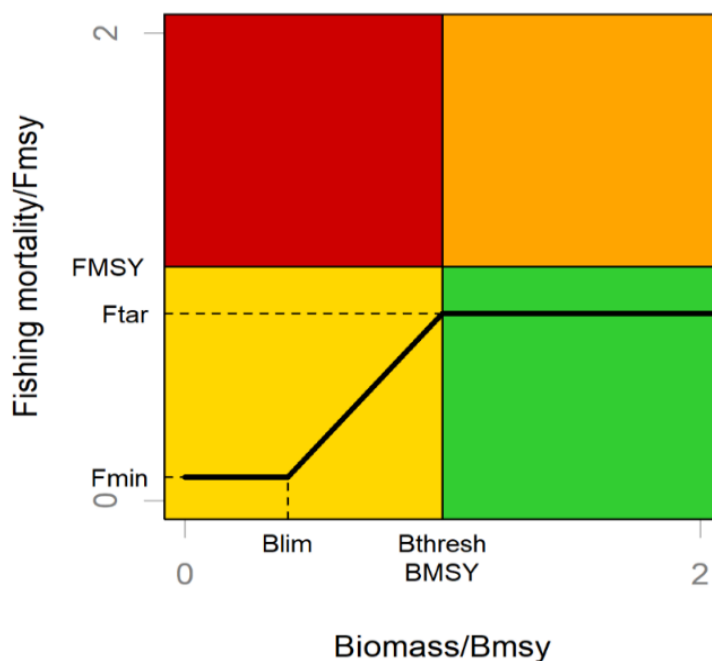
ALB-AT-Figure 4. North Atlantic albacore (Kobe plot). Stock status trajectories of B/B_{MSY} and F/F_{MSY} over time (1930-2021), as well as uncertainty (grey dots) around the current (F_{2021}/F_{MSY} , B_{2021}/B_{MSY}) estimate (blue point) based on Stock Synthesis model with probability of being overfished and overfishing (red, 0%), of being neither overfished nor overfishing (green, 99.6%), and of being overfished (yellow, 0.4%).



ALB-AT-Figure 5. South Atlantic albacore. Standardized catch rates used for the base case of the 2020 stock assessment (ICCAT, 2020b).



ALB-AT-Figure 6. South Atlantic albacore (Kobe plot). Stock status trajectories of B/B_{MSY} and F/F_{MSY} over time (1956-2018), as well as uncertainty (grey dots) around the current (2018) estimate (blue point) based on Bayesian surplus production model with probability of being overfished and overfishing (red, 0%), of being neither overfished nor overfishing (green, 99.4%), and of being overfished (yellow, 0.6%).



ALB-AT-Figure 7. Graphic form of the HCR adopted in [Rec. 17-04](#). B_{LIM} (set at $0.4B_{MSY}$) is the limit biomass reference point, B_{THRESH} (set at B_{MSY}) is the point below which fishing mortality decreases linearly, F_{TAR} (set at $0.8F_{MSY}$) is the target fishing mortality rate to be applied to achieve the management objectives, and F_{MIN} (set at $0.1F_{MSY}$) is the fishing mortality to be applied when $B < B_{LIM}$.