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WCPFC PROJECTS 117, 118 & 126: BIOLOGICAL SAMPLING PLANS FOR TUNA, BILLFISH & SHARKS

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Executive Summary

Biological sampling underpins the stock assessments of tuna and billfish in the Western and Central Pacific Ocean (WCPO), both in informing external estimates of biological parameters that are then used as an input to assessment models, or informing the assessment model directly as data inputs.

In this context, WCPFC SC recommended the development of biological sampling plans for tuna, billfish and shark species to help guide collections. Given the need to continually collect biological samples, and some of the significant gaps across size and spatial strata, such plans will need to be highly collaborative.

The Scientific Services Provider convened an online meeting with interested parties in October 2024 to discuss potential approaches to developing the biological sampling plans. Following discussions at the meeting it was proposed that: the development of the sampling plan should take an iterative approach, starting with a relatively simple power analysis building on the approach used to develop sampling plans for North Pacific billfish; the method be developed initially for two tuna species with differing life history and fisheries characteristics; an initial sampling plan be presented at WCFPC SC21; future work should continue to define priority hypotheses regarding life history parameters.

The power analysis was developed in 2025 and applied to skipjack and bigeye. The power analysis was then used to construct a framework for the design of biological sampling plans that can be applied to selected tuna, billfish and shark species, focussed on the estimation of growth. The power analysis and sampling design framework were reported to WCPFC SC21. In this report, we use the sampling design framework to set target sampling rates for selected tuna, billfish and shark species.

Finally, we note that for billfish and sharks, there will remain challenges in implementing the design given the practical limitations of observer coverage in the face of the encounter rates of what are often bycatch species, and non-retention management interventions for some sharks.

1 Introduction

The Western and Central Pacific Ocean has accounted for over 50% of the global tuna catch in recent years (Williams and Ruaia, 2023), with tuna fisheries in the region making substantial contributions to the economies of Pacific Island countries and territories (Ruaia et al., 2020). WCPFC supports the collection and storage of biological samples through the WCPFC Pacific Marine Specimen Bank (PMSB), which as of 12 December 2025 had samples collected from 238,000+ individuals covering more than 160 species ranging from micronekton through to tuna and billfish (SPC-OFP, 2025). However, there is no formal sampling plan for the PMSB, with samples collected on a more opportunistic basis primarily by observers and port samplers, as well as Pacific Community-led tagging cruises. The collection of representative biological samples underpins the effective management of tuna and tuna-like species in the region.

In this context, WCPFC SC19 and SC20 recommended the development of biological sampling plans for tuna, billfish and shark species. Given the need to continually collect biological samples, and some of the significant gaps across size and spatial strata, such plans will need to be highly collaborative. The Pacific Community held an online meeting in October 2024 with interested parties to discuss the potential approaches that could be taken for developing a biological sampling plan for WCPO tuna, billfish and shark species, and to agree on the necessary specifics and potential priorities. Following the discussions of the online meeting, it was proposed that:

1. Design of biological sampling plans should take an iterative approach, focused initially on relatively simple power analyses building on the approach used for North Pacific billfish species (Kinney et al., 2023) and focussed primarily on estimation of growth curves, with consideration of maturity.

2. The method be developed initially for two tuna species with differing life history and fisheries characteristics, including selectivity shapes for key fisheries.

3. An initial sampling plan be presented at WCFPC SC21.

4. Defining the priority hypotheses regarding life history parameters should be continued over a longer period of time, to inform sampling plans tailored to the specific needs of each species.

Peatman et al. (2025) developed a power analysis which was applied to skipjack and bigeye tuna. The power analysis confirmed that proportional otolith sampling outperformed fixed otolith sampling for both species, with acceptable levels of bias in estimated growth curves with the use of proportional otolith sampling. The results of the power analysis were then used to construct a framework to develop biological sampling plans for both targeted and incidentally caught species. In this report, we apply this framework to define biological sampling plans for the following: albacore tuna (*Thunnus alalunga*, Scombridae) in the southwest Pacific Ocean; bigeye (*Thunnus obesus*, Scombridae), skipjack (*Katsuwonus pelamis*, Scombridae) and yellowfin tuna (*Thunnus albacares*, Scombridae) in the western

and central Pacific Ocean; swordfish (*Xiphias gladius*, Xiphiidae), striped marlin (*Kajikia audax*, Istiophoridae), blue marlin (*Makaira nigricans*, Istiophoridae) and black marlin (*Istiompax indica*, Istiophoridae) in the southwest Pacific Ocean; silky shark (*Carcharhinus falciformis*, Carcharhinidae) and oceanic whitetip (*Carcharhinus longimanus*, Carcharhinidae) in the western and central Pacific Ocean; and, blue shark (*Prionace glauca*, Carcharhinidae) and shortfin mako (*Isurus oxyrinchus*, Lamnidae) in the southwest Pacific Ocean. The biological sampling plans are intended to support independent estimation of growth and maturity parameters, i.e., external to stock assessments. These can then be used to validate estimates from stock assessments, and inform how to most appropriately represent these processes in stock assessment models.

2 Methods

Sampling plans were developed based on the framework outlined by Peatman et al. (2025), which applies proportional otolith sampling, in which samples are drawn from length classes in proportion to their contribution to catches. Proportional otolith sampling has been shown to yield unbiased estimates of growth curves, or acceptable levels of bias, across a range of taxa and simulated applications (e.g., Schemmel et al., 2022). Briefly, a target number of 300 samples was allocated to each sampling region for all species, with the regions aiming to distribute samples across the spatial extent of the population, or the fisheries exploiting the population as a proxy. This level of sampling should provide sufficient information to estimate growth at an ocean basin level, explore spatial variation in growth at a broad-scale, and also collect information that should be helpful to design sampling plans to test more detailed hypotheses in the future. Within each region, the target number of samples was then apportioned among fleets in proportion to their contribution to recent catches (by number), having filtered for fleets contributing a minimum of 7.5% of the total catch for a given species and region combination. For each fleet and region combination, the target samples for that fleet were then distributed amongst length classes, in proportion to the size composition of the catch of the fleet within the sampling region based on recent length frequency data. These target samples per region, fleet and length class are intended for use in estimation of growth.

Fleets were defined on the basis of fishing gear, vessel flag-state, fleet–segment (i.e., distant-water vs offshore fleets, where these are differentiated in available catch and size data), and, for purse-seine, set-type. Fleet identifiers consist of a fishing method prefix (LL = longline, FS = purse-seine effort on free-school sets, ASS = purse-seine effort on associated schools), and the vessel flag and fleet–segment where available (DW = distant-water, OS = off-shore), separated by a hyphen.

Length class intervals were informed by $L_\infty \cdot 30^{-1}$ (Coggins Jr et al., 2013), with a preference for intervals that are multiples of 2, 5 or 10cm. Following Kinney et al. (2023), we supplemented the target samples for growth estimation with additional samples intended specifically for estimation of maturity ogives, with a minimum of 10 samples per length classes for those smaller than $0.66 \cdot L_\infty$ in order to ensure sufficient sampling of length classes with immature fish (Jensen, 1996). These

supplemental samples for estimation of maturity were distributed among sampled fleets in proportion to their contribution to catches per region. Selected length class intervals, and the largest length classes with supplemental sampling for estimation of maturity, are provided in Table 1, along with the estimates of L_∞ used to derive these quantities. The lower limit of supplemental samples for the estimation of maturity was set at the 0.001 quantile from available length-frequency data for each species, calculated over the time window used for estimation of size compositions of catches.

For tuna and billfish species, catch data were taken from aggregate catch and effort data based on vessel logbooks, i.e., the L BEST dataset. For shark species, catch data were based on estimated catch reconstructions generated for assessments, which are available for blue shark (Neubauer et al., 2021), oceanic whitetip shark (Neubauer and Large, 2025), shortfin mako shark (Large et al., 2022) and silky shark (Neubauer et al., 2024). For tuna and billfish species, the last five years of complete catch data were used to calculate the proportional contribution of each fleet to total catch, i.e., 2020–2024. The last five years of estimated catches were also used for shark species, with the time-window varying by species. Purse seine catches of bigeye and yellowfin were converted from metric tonnes to numbers, using estimated length compositions per species and fleet (pooled across years) in combination with species-specific length-weight relationships (Peatman et al., 2026).

For all species, available length frequency data were taken from the LF Master dataset held by the Pacific Community, which includes samples collected by at-sea observers and samplers in port, as well as aggregate data submissions which can include a range of data sources. The units of length used in this report are upper jaw to fork length for tuna species. Lower jaw to fork length was used for billfish species, with the exception of striped marlin which used eye orbital to fork length. Length measurements for shark species were upper jaw to fork length. The last five years of length frequency data were used to inform the size composition of longline catches of tuna and billfish, i.e., 2020–2024. For purse seine length frequencies of tuna, we used data from 2018–2019 and 2023–2024; data from 2020–2022 were excluded due to the impacts of COVID-19 which reduced the observer coverage rate and introduced sampling bias due to variation in the reduction of observer coverage between fleets (Peatman et al., 2022). We used a longer timeseries of length-frequency data for shark species, covering the period 2010–2024, given that length frequency data for these species is typically more limited. Length-frequency data at spatial resolutions coarser than a 5° spatial cell were split to a 5° spatial resolution per fleet and year-quarter, by apportioning the length frequencies amongst 5° cells in proportion to the fleet's catch in that year-quarter, using the approach outlined in Peatman et al. (2026). For example, length frequencies at a 10 x 20° spatial resolution would be split amongst a maximum of eight 5° cells.

Sampling regions were defined based on the assessment regions from the most recent assessment, or that of a proxy species in the case of blue and black marlin. Sampling regions for albacore were taken from the region structure used in 2024 assessment of south Pacific albacore (Teears et al., 2024) (Figure 1). For bigeye, sampling regions were defined on the region structure used in the

2023 assessment (Day et al., 2023), though with region 9 combined with region 5 (Figure 2). The bigeye sampling regions were also used for yellowfin, representing the (sub)region structure used to define extraction fisheries in the 2023 assessment (Magnusson et al., 2023). Sampling regions for swordfish were based on the (sub)region structures used in the 2025 assessment (Day et al., 2025), though with regions 2-A and 3-A combined, and regions 2-B and 3-B combined, due to the limited levels of catch in the southernmost regions (Figure 4). Sampling regions for striped marlin were based on the (sub)region structure used in the 2025 reassessment (Castillo-Jordán et al., 2025). Sampling regions for blue and black marlin were based loosely on the sampling regions for striped marlin, though with: a longitudinal split in the northern region at 170W afforded by the relatively high catches in the equatorial zone for these species; and, the collapsing of the two regions in the southwest given the relatively low levels of catch between 30S and 40S (Figure 6). Sampling regions for sharks were created with the over-riding objective of informing investigation of both latitudinal and longitudinal variation in biological processes, with consideration of the spatial distribution of estimated catches. The sampling regions for silky shark, oceanic whitetip shark, blue shark and shortfin mako shark are provided in Figures 7, 8, 9 & 10.

For all species, it was assumed that there was no sampling from domestic purse seine and longline fisheries in the western sector of the western and central Pacific Ocean, including in the EEZs of Indonesia and the Philippines. There are appreciable numbers of samples from the Soccsksargen region of the Philippines in the Pacific Marine Specimen Bank. However, these are ignored here, given that at-sea observers have been proposed as the sampling platform to implement the biological sampling plans (Peatman et al., 2025).

For bigeye and yellowfin, the proportional contribution of purse seine fleets to total catches (by numbers) in regions 3, 4 and 8 was such that all samples were initially assigned to purse seine fleets, with no sampling of longline fleets. To ensure sampling across the full range of length classes in these regions, we reduced the samples assigned to purse seine fleets to 200 samples per region, and then distributed an additional 200 samples across longline fleets per region (as above), resulting in 400 samples from each region per species.

Target sample sizes were then compared against existing samples in the Pacific Marine Specimen Bank (PMSB) to identify data gaps. PMSB samples were filtered for the period 2020–2024, in order to reflect available samples that could be used to explore spatial variation in growth rates or maturity whilst attempting to control for the effects of potential temporal variation in life-history characteristics. PMSB samples were also filtered for individuals with length measurements in the appropriate length unit, i.e., upper jaw to fork length for tuna and sharks, lower jaw to fork-length for billfish (or eye orbital to fork-length for striped marlin). PMSB samples were filtered for otoliths, spines for billfish, and vertebra for sharks, to reflect samples available for estimation of age and growth, and gonads to reflect samples available for estimation of maturity. The number of sampled individuals was then extracted for each species, region and length class.

3 Results & Discussion

The total target number of individuals to be sampled per fleet is provided in Table 2. Across all species, the target number of samples for longline fleets was 15,540 individuals, with a further 476 supplemental samples for estimation of maturity ogives, spread relatively evenly across tuna, billfish and sharks. For purse seine fleets, the target number of samples was 4,260 individuals, with a further 158 supplemental samples for estimation of maturity ogives, of which ca. 75% were for tuna species, with the remaining 25% for sharks. For context, these target sample numbers compare to ca. 29,000 south Pacific albacore that were sampled in 2025 alone to support close-kin mark recapture experiments (SPC-OFP, 2025).

More detailed breakdowns of target-sample sizes are provided in species-specific appendices (albacore – Appendix A, bigeye tuna – Appendix B, skipjack tuna – Appendix C, yellowfin tuna – Appendix D, swordfish – Appendix E, striped marlin – Appendix F, blue marlin – Appendix G, black marlin – Appendix H, blue shark – Appendix I, silky shark – Appendix J, oceanic whitetip shark – Appendix K, shortfin mako – Appendix L. Each appendix includes: maps of total reported catch, and catches from sampled fleet-region combinations for tuna and billfish species (e.g., Figure A.1 for albacore); a summary of total target samples per fleet, along with the average annual catch, the number of available length samples for estimation of size compositions, and for shark species, the average annual observed catch, per fleet and sampling region (e.g., Table A.1 for albacore); region-specific tables of the target number of samples per fleet and length-class (e.g., Tables A.2–A.7 for albacore); region-specific figures of the estimated size composition of catches per fleet (e.g., Figures A.2–A.7 for albacore); and, comparisons of target samples with data holdings in the Pacific Marine Specimen Bank per region (e.g., Table A.8 for albacore). Additionally, for the tuna species, there are also more maps of available otoliths in the Pacific Marine Specimen Bank (PMSB) (e.g., Figure A.8 for albacore), and, comparisons of target samples against available samples in the PMSB by region and length class (e.g., Table A.9 for albacore), for regions with sufficient samples in the PMSB to support these comparisons.

Available samples in the Pacific Marine Specimen Bank were similar for both otoliths & fin spines, for estimation of growth, and gonads for estimation of maturity. As such, whist we focus here on reporting on coverage of available samples for estimation of growth, the commentary applies equally to availability of gonads for estimation of maturity. Flag states with the greatest contribution to the filtered PMSB samples included the Solomon Islands (29% of total samples), Papua New Guinea (25%), the Philippines (20%) and New Caledonia (11%). The number of available samples for shark species and billfish species was very limited, both in total, and when compared against target sample sizes per sample region (Tables E.6, F.6, G.6 & H.6 for billfish, and Tables I.8, J.7, K.7 & L.6 for sharks). For albacore, the number of available samples exceeded the target sample sizes in regions 2-B and 2-C, with very limited samples from elsewhere (Table A.8 and Figure A.8). For tropical tuna, the number of available samples typically exceeded the target number of samples in the equatorial regions, and regions in the south Pacific, though with limited availability of samples north of 10N (Table B.13

and Figure B.13 for bigeye, Table C.8 and Figure C.8 for skipjack, and Table D.13 and Figure D.13 for yellowfin). However, there were numerous instances of insufficient samples for specific length-classes, e.g., Table B.14.

Despite the availability existing samples in the Pacific Marine Specimen Bank for the species of interest, we recommend that the target samples should be collected in full with the implementation of the biological sampling programme, i.e., ignoring samples that are already available . Sampling locations for some samples in the PMSB are approximate, reflecting the mid-point of a trip in cases where the sample could not be linked to a specific fishing event. Secondly, the combination of samples collected in different locations across different time-periods raises the potential for introduction in bias, e.g., confounding of spatial and temporal variation.

We recommend that a variety of sample types should be collected from each sampled individual, following those routinely collected for the Pacific Marine Specimen Bank (SPC-OFP, 2025). For tuna, sample types should include otoliths for age and growth estimation, gonads for maturity, and muscle tissue (or fin clips) for genetics and tissue biopsies. For billfish, dorsal fin spines should also be collected for estimation of age and growth. For sharks, sample types should include pre-caudal vertebrae, claspers (males) or ovaries & uteri (females) and muscle tissue. The collection of all sample types from all sampled individuals provides the most statistically powerful dataset, in enabling multi-variate analyses using paired observations from the same individuals, and also represents the most efficient use of sampling effort (Kinney et al., 2023).

As noted in Peatman et al. (2025), it is proposed that at-sea observers collect the samples, in order to ensure that the fish are in optimum condition at the point of sampling. However, the proposed number of sampled individuals for billfish and shark species typically represents a substantial proportion of average annual observed catches, and in many cases exceeds the average annual observed catch, e.g., see Table H.1 & L.1 for black marlin and shortfin mako respectively. As such, it is reasonable to expect that the target sampling rates set out in this report would require sampling effort across a number of years. There are also fleets that have been selected for sampling with limited at-sea observer coverage due to a shift towards electronic monitoring approaches. As such, it may be necessary to consider alternative sampling approaches in some cases, e.g. port-sampling. Achieving the target sampling rates for shark species is likely to be problematic, particularly for those species with non-retention policies in place through either regional or national-level management in particular (e.g., WCPFC CMM 2025-06 and it's predecessors).

There is no explicit time-frame specified for the collection of the biological samples. We recommend that sampling should be undertaken over the shortest practical period of time for a given species, to allow collection of the target samples of that species across all sampling regions. A consistent time-period of sampling across regions would control for potential temporal variation in biological processes that might otherwise result in bias due to confounding between spatial and temporal variation. As outlined in Peatman et al. (2025), the proposed biological sampling plan is iterative. The target sampling rates

outlined in this report represent an initial phase, with continued biological sampling through time to allow monitoring of temporal variation in life history characteristics, as well as refinements to the sampling plan to target priority hypotheses to be tested on a species-by-species basis.

Following Kinney et al. (2023), sampled individuals for a given species, sampling region and length class combination should include both males and females, absent sexual dimorphism that may result in limited numbers of either sex at the largest size classes, in order to support sex-specific estimation of life-history characteristics. For length classes with a target sample size of one, we recommend that this be randomly assigned to either sex.

It is envisaged that analyses of spatial variation in life-history characteristics should use all available biological samples from each region, with the exception of the supplemental samples for estimation of maturity, which should only be used for estimation of maturity and not estimation of other life-history characteristics, e.g., growth. However, estimation of life-history characteristics of each species in the western & central Pacific Ocean, or southwestern Pacific Ocean, would require sub-sampling from the full dataset to ensure a representative sample at an ocean-basin level.

For albacore, the estimated proportion of individuals in catches that are likely to be juveniles is low (Figures A.2–A.7). Supplemental samples for estimation of maturity were calculated and included in the target samples per region, fleet, length class (Tables A.2–A.7). However, it appears unlikely that sufficient immature fish would be sampled to allow estimation of maturity ogives for albacore with the sampling design developed here. A sampling programme designed specifically for estimation of maturity of albacore would be more a more practical way forward, e.g., with targeted sampling from temperate troll fisheries with a greater proportion of juvenile albacore in catches.

The approach used to identify fleets for sampling results in relatively few fleets being sampled in each region per species. This is helpful in facilitating the application of proportional otolith sampling, in that it ensures sufficient samples per fleet to allow sampling in proportion to the size composition of catches. However, across all species there are still 39 fleets targeted for sampling, which will require close collaboration between members if the target sampling rates are to be realised.

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Declaration of generative AI and AI-assisted technologies in the SC paper preparation process

No AI technologies were used in the preparation of this paper.

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Tables

Table 1: Estimates of L_∞ (and source) by species, along with the derived length class interval ($L_\infty \cdot 30^{-1}$) and lower limit of the largest size class with supplemental samples for estimation of maturity ($0.66 \cdot L_\infty$).

Species	L_∞	Source	Length class int. (cm)	Length class mat. (cm)
Albacore	140	Teears et al. (2024)	2	72
Bigeye tuna	155	Day et al. (2023)	5	100
Skipjack tuna	80	Teears et al. (2025)	2	52
Yellowfin tuna	150	Farley et al. (2020)	5	95
Swordfish	260	L_∞ for females from Day et al. (2025)	10	170
Striped marlin	215	Estimate from Castillo-Jordán et al. (2025)	5	140
Blue marlin	297	L_2 for females from Chang et al. (2025) converted to LF (LF = 1.11 · EOL)	10	190
Black marlin	397	L_∞ for females from Sun et al. (2015)	10	260
Blue shark	267	L_∞ for females from Manning (2005)	10	170
Silky shark	214	Oshitani et al. (2003)	10	140
Oceanic whitetip shark	310	Joung et al. (2016)	10	200
Shortfin mako	395	L_∞ for males & females combined from Large et al. (2022)	10	260

Table 2: Total biological samples (Bio), and supplementary samples for maturity estimation (Mat), per fleet and species-type (tuna, billfish and shark). LL prefixes in fleet identifiers denote longline, FS refers to purse seine fishing on free-schools, and ASS refers to purse seine fishing on associated schools (see Section 2). For tuna and billfish, target samples are provided separately for Chinese Taipei's offshore (LL-TWOS) and distant water (LL-TWDW) longline fleets, whereas for sharks, target samples are provided for both the offshore and distant-water fleets combined (LL-TW).

Fleet	Tuna		Billfish		Shark		Total	
	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
LL-CN	1651	48	1194	41	669	22	3514	111
LL-KR	711	13	227	8	504	17	1442	38
LL-TW	0	0	0	0	1398	47	1398	47
LL-JP	993	29	71	2	259	8	1323	39
LL-AU	164	5	756	26	217	8	1136	39
LL-FJ	325	11	329	11	372	12	1025	34
LL-TWOS	629	17	270	8	0	0	899	25
LL-SB	428	7	166	5	105	4	699	16
LL-ES	0	0	643	21	0	0	643	21
LL-PF	94	3	414	13	104	3	612	19
LL-TWDW	169	5	314	10	0	0	483	15
LL-NZ	0	0	0	0	414	13	414	13
LL-NC	27	1	112	4	199	7	338	12
LL-VU	102	3	97	3	139	4	338	10
LL-US	0	0	0	0	334	11	334	11
LL-KI	93	1	145	5	56	2	295	8
LL-USHW	245	9	0	0	0	0	245	9
LL-FM	68	0	30	1	60	2	157	3
LL-PW	0	0	0	0	144	5	144	5
LL-PG	45	0	0	0	0	0	45	0
LL-TO	0	0	29	1	0	0	29	1
LL-MH	26	0	0	0	0	0	26	0
ASS-JP	330	12	0	0	191	6	521	18
ASS-TW	250	11	0	0	76	3	326	14
ASS-KI	317	14	0	0	0	0	317	14
ASS-FM	193	8	0	0	60	2	253	10
ASS-SB	26	1	0	0	189	6	215	7
ASS-US	154	7	0	0	44	1	198	8
ASS-PG	131	6	0	0	48	2	179	8
ASS-KR	129	5	0	0	0	0	129	5
ASS-ES	59	3	0	0	39	1	97	4
ASS-MH	97	4	0	0	0	0	97	4
ASS-PH	0	0	0	0	45	1	45	1
ASS-NR	25	1	0	0	0	0	25	1
FS-JP	892	30	0	0	145	5	1037	35
FS-PG	370	15	0	0	192	6	562	21
FS-KR	161	5	0	0	0	0	161	5
FS-TW	53	2	0	0	0	0	53	2
FS-FM	44	1	0	0	0	0	44	1

Figures

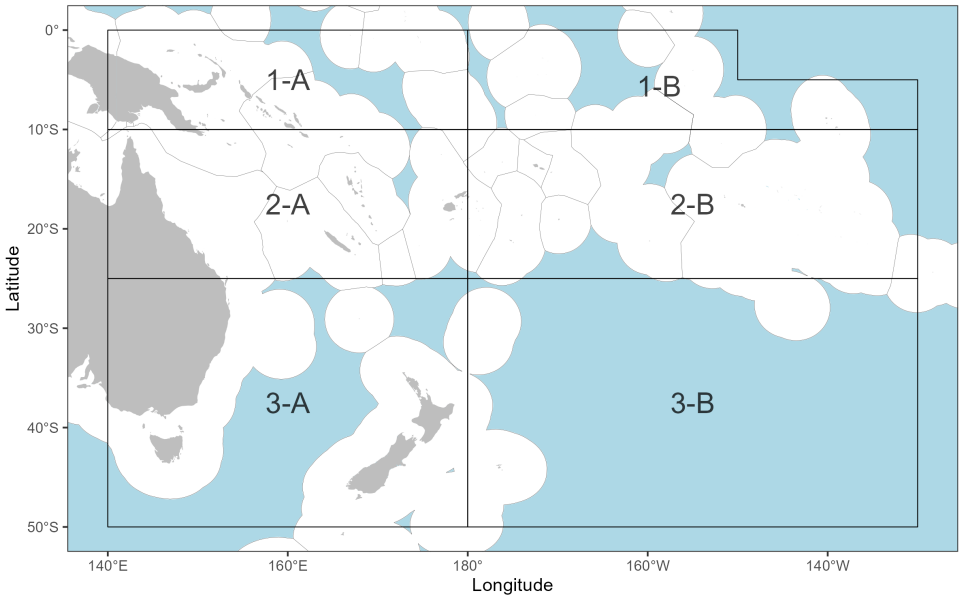


Figure 1: The sampling regions used to create the biological sampling plans for albacore tuna in the southwest Pacific Ocean. The information provided in this map is for general informational purposes only. Exclusive Economic Zone (EEZ) boundaries are subject to international agreements, disputes, and interpretations, which may not be fully captured here.

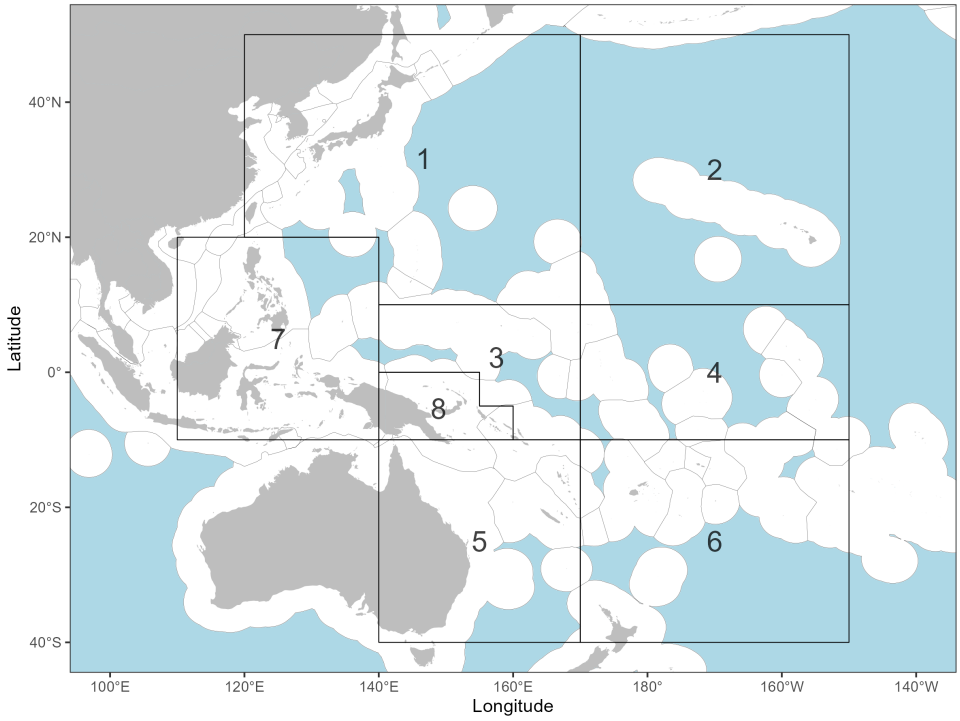


Figure 2: The sampling regions used to create the biological sampling plans for bigeye & yellowfin tuna in the western and central Pacific Ocean. The information provided in this map is for general informational purposes only. Exclusive Economic Zone (EEZ) boundaries are subject to international agreements, disputes, and interpretations, which may not be fully captured here.

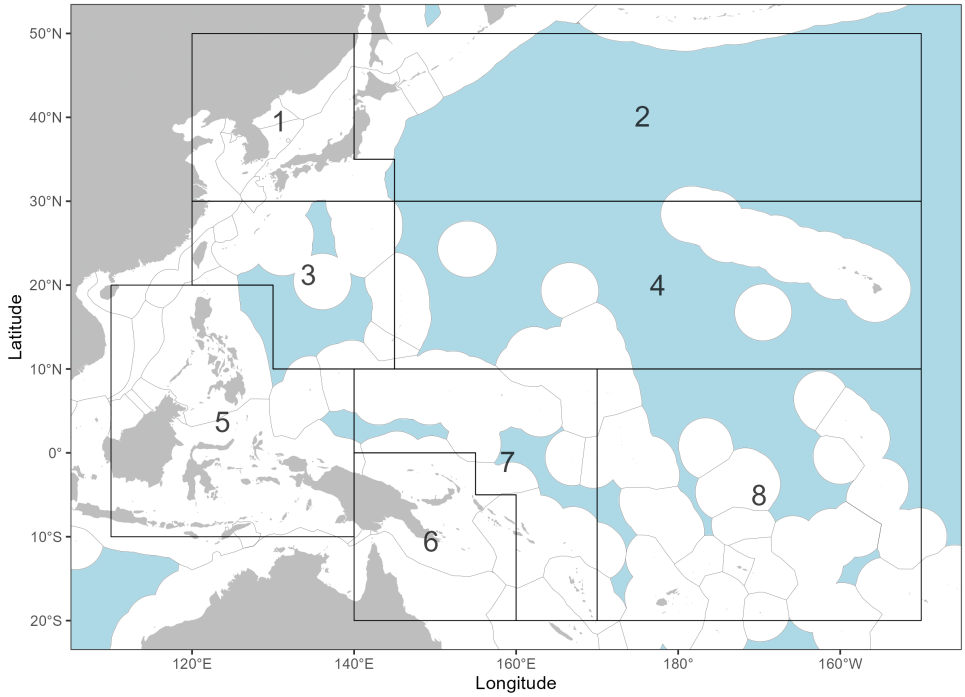


Figure 3: The sampling regions used to create the biological sampling plans for skipjack tuna in the western and central Pacific Ocean. The information provided in this map is for general informational purposes only. Exclusive Economic Zone (EEZ) boundaries are subject to international agreements, disputes, and interpretations, which may not be fully captured here.

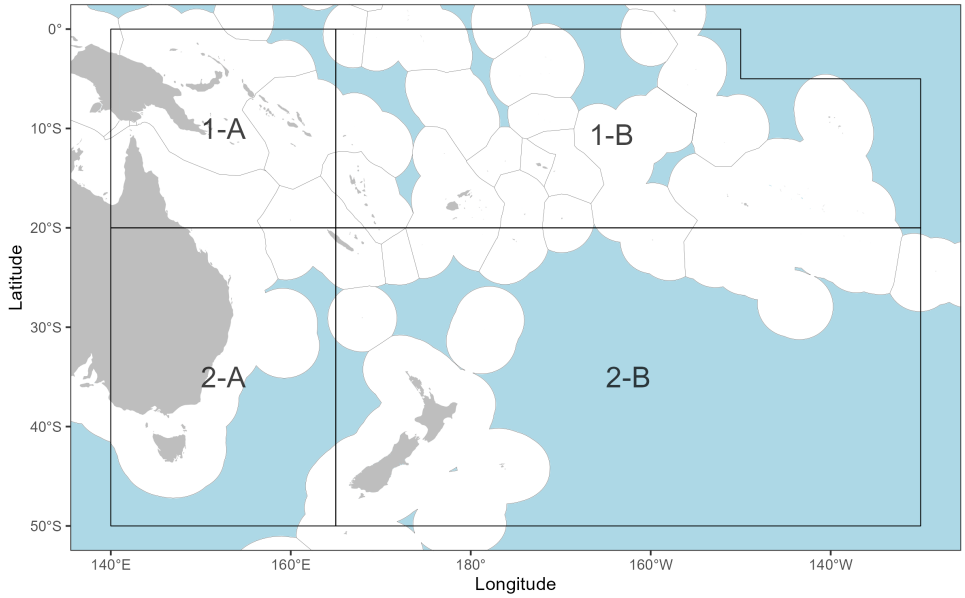


Figure 4: The sampling regions used to create the biological sampling plans for swordfish in the southwest Pacific Ocean. The information provided in this map is for general informational purposes only. Exclusive Economic Zone (EEZ) boundaries are subject to international agreements, disputes, and interpretations, which may not be fully captured here.

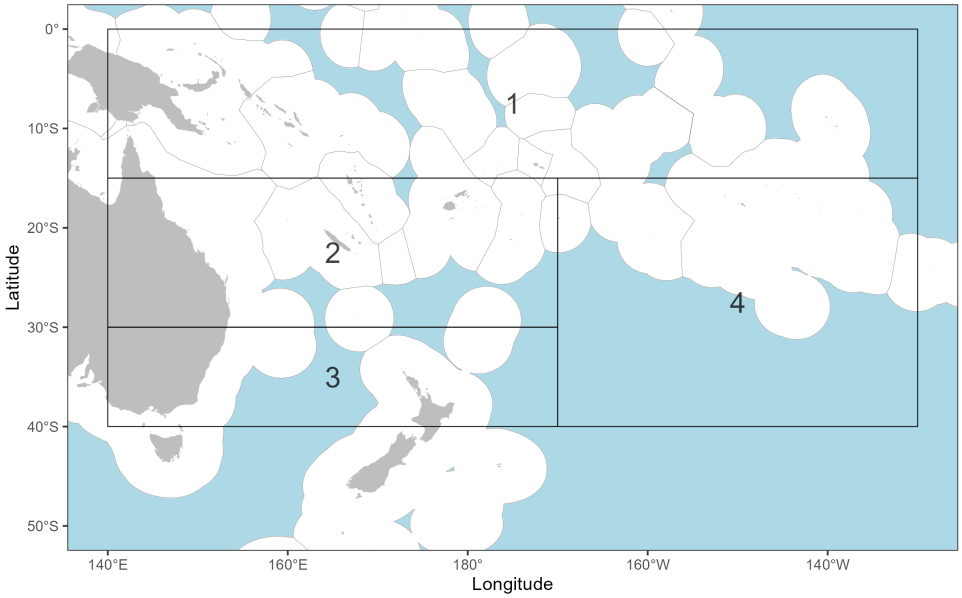


Figure 5: The sampling regions used to create the biological sampling plans for striped marlin in the southwest Pacific Ocean. The information provided in this map is for general informational purposes only. Exclusive Economic Zone (EEZ) boundaries are subject to international agreements, disputes, and interpretations, which may not be fully captured here.

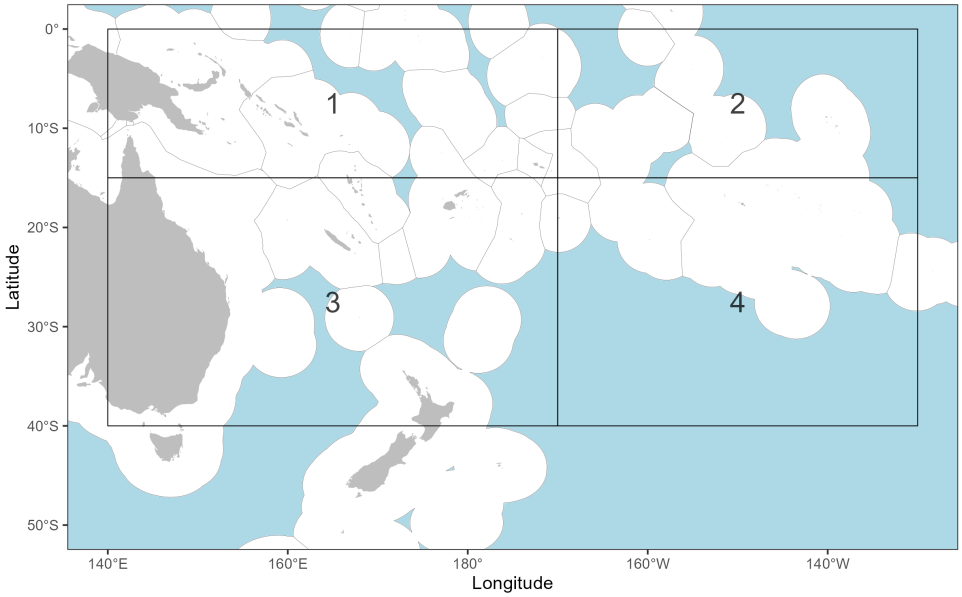


Figure 6: The sampling regions used to create the biological sampling plans for blue & black marlin in the southwest Pacific Ocean. The information provided in this map is for general informational purposes only. Exclusive Economic Zone (EEZ) boundaries are subject to international agreements, disputes, and interpretations, which may not be fully captured here.

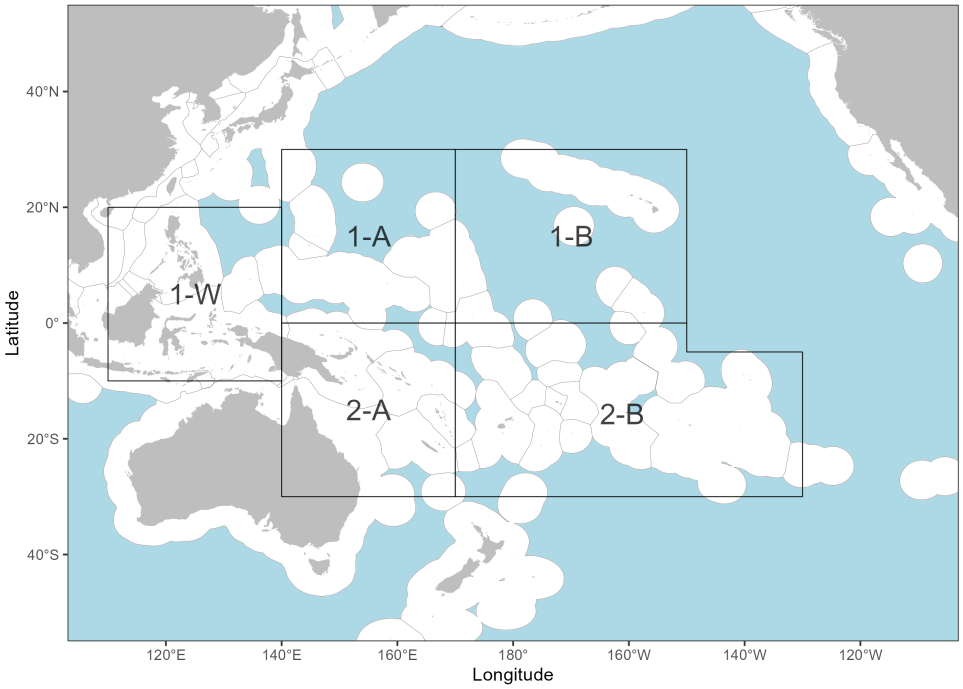


Figure 7: The sampling regions used to create the biological sampling plans for silky shark in the western and central Pacific Ocean. The information provided in this map is for general informational purposes only. Exclusive Economic Zone (EEZ) boundaries are subject to international agreements, disputes, and interpretations, which may not be fully captured here.

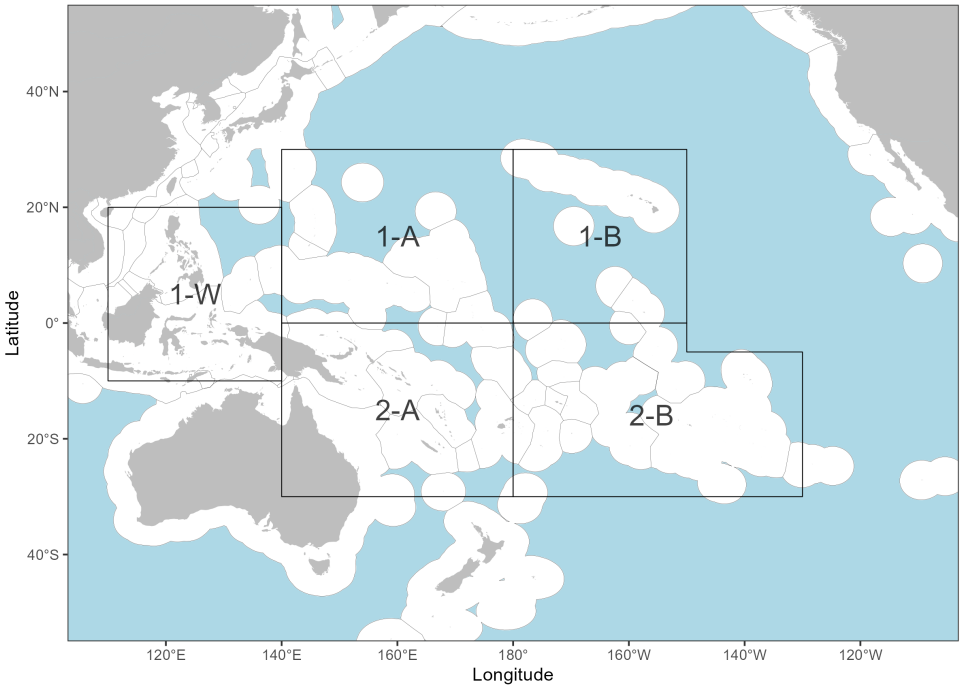


Figure 8: The sampling regions used to create the biological sampling plans for oceanic whitetip shark in the western and central Pacific Ocean. The information provided in this map is for general informational purposes only. Exclusive Economic Zone (EEZ) boundaries are subject to international agreements, disputes, and interpretations, which may not be fully captured here.

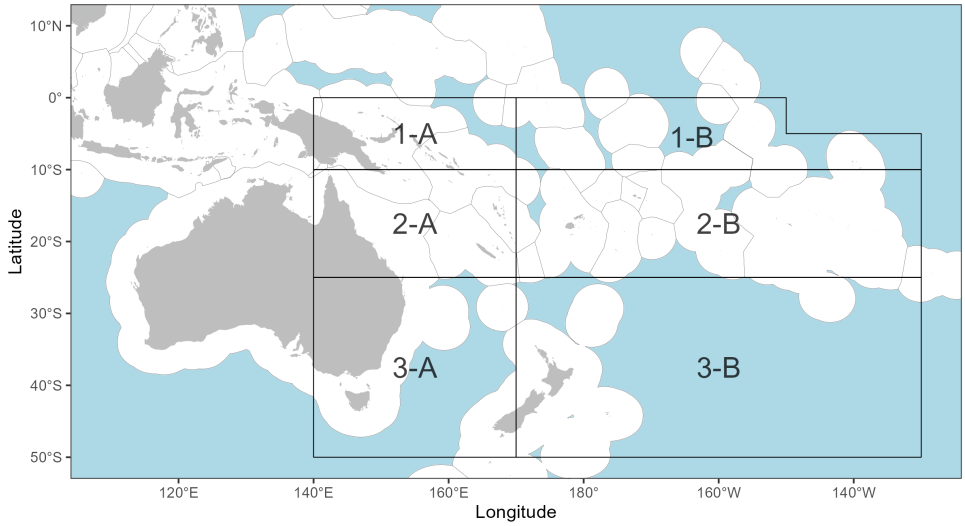


Figure 9: The sampling regions used to create the biological sampling plans for blue shark in the southwest Pacific Ocean. The information provided in this map is for general informational purposes only. Exclusive Economic Zone (EEZ) boundaries are subject to international agreements, disputes, and interpretations, which may not be fully captured here.

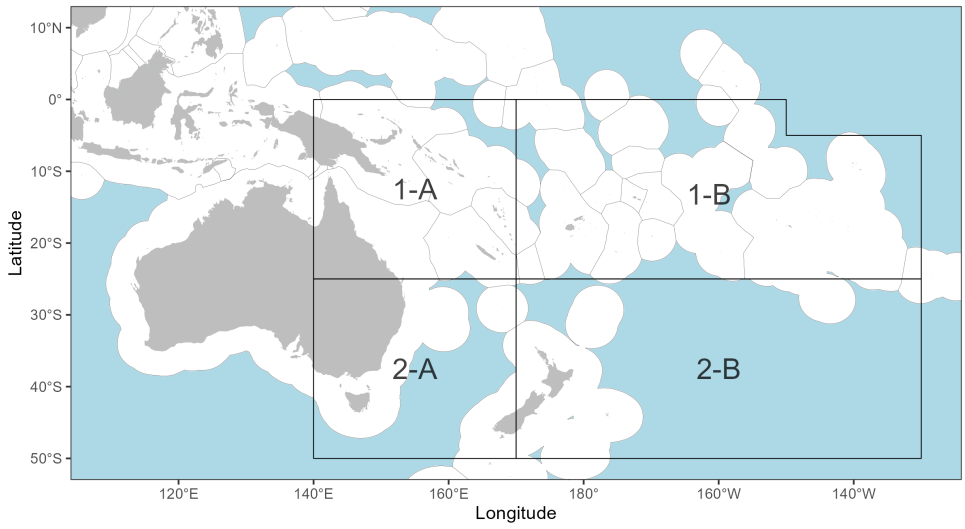
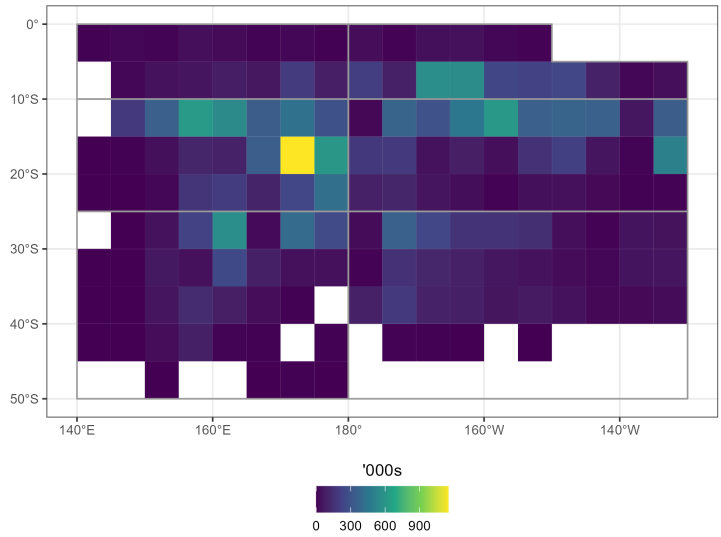


Figure 10: The sampling regions used to create the biological sampling plans for shortfin mako shark in the southwest Pacific Ocean. The information provided in this map is for general informational purposes only. Exclusive Economic Zone (EEZ) boundaries are subject to international agreements, disputes, and interpretations, which may not be fully captured here.

Appendices

A Albacore

(a) Total reported catch



(b) Catch from sampled fleet-region combinations

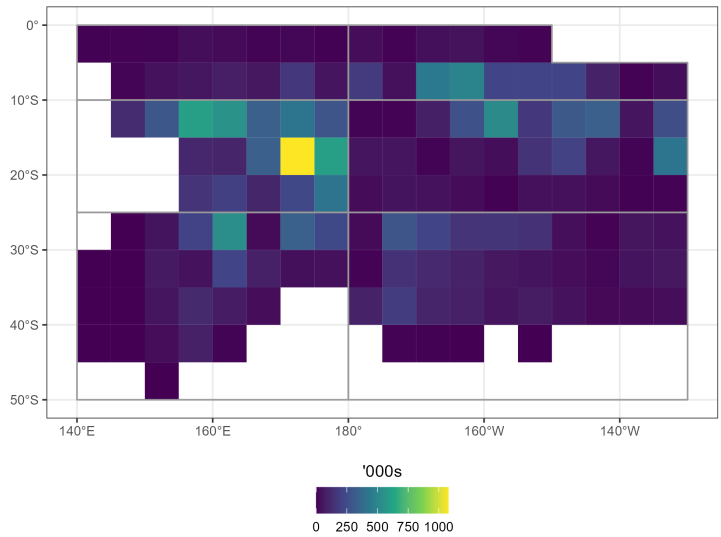


Figure A.1: Albacore: Spatial distributions of a) total reported catches and b) reported catch from sampled fleet-region combinations from 2020–2024, with sampling as per the developed biological sampling plan.

Table A.1: Albacore: average annual catch (thousands), available length samples for estimation of length frequencies (LF samples, individuals), target biological sampling rate (Bio. samples, individuals), and maximum supplemental samples for estimation of maturity per length class (Mat. samples, individuals), per region (Reg.) and fleet (LL prefix denotes longline, see Section 2).

Reg.	Fleet	Catch ('000s)	LF samples (n)	Bio. samples (n)	Mat. samples (n)
1-A	LL-CN	61.5	17310	177	6
1-A	LL-SB	22.8	4083	66	2
1-A	LL-KR	19.7	1708	57	2
1-B	LL-CN	202.4	28131	150	5
1-B	LL-TWOS	113.8	31574	84	3
1-B	LL-KI	49.7	12344	37	1
1-B	LL-KR	39.3	2897	29	1
2-A	LL-CN	662.6	127042	168	6
2-A	LL-FJ	298.2	168942	76	3
2-A	LL-SB	115.0	4083	29	1
2-A	LL-NC	105.9	46436	27	1
2-B	LL-CN	274.7	62159	128	4
2-B	LL-PF	201.2	77810	94	3
2-B	LL-TWOS	166.0	219550	78	3
3-A	LL-CN	157.2	26533	106	4
3-A	LL-TWDW	103.8	36813	70	2
3-A	LL-JP	71.6	24813	48	2
3-A	LL-AU	61.9	0	42	1
3-A	LL-FJ	49.4	4868	33	1
3-B	LL-VU	159.9	14809	102	3
3-B	LL-TWDW	154.9	42133	99	3
3-B	LL-CN	92.3	37127	59	2
3-B	LL-TWOS	63.7	27944	41	1

Table A.2: Albacore - region 1-A: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-CN		LL-SB		LL-KR	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
1-A	54	0	6	0	2	1	1
1-A	56	0	6	0	2	1	1
1-A	58	0	6	0	2	1	1
1-A	60	0	6	0	2	1	1
1-A	62	0	6	0	2	0	2
1-A	64	0	6	0	2	0	2
1-A	66	0	6	0	2	0	2
1-A	68	0	6	0	2	0	2
1-A	70	0	6	0	2	0	2
1-A	72	0	6	0	2	0	2
1-A	74	0	0	0	0	0	0
1-A	76	1	0	0	0	0	0
1-A	78	9	0	0	0	0	0
1-A	80	10	0	1	0	2	0
1-A	82	15	0	2	0	3	0
1-A	84	14	0	5	0	6	0
1-A	86	18	0	8	0	4	0
1-A	88	18	0	11	0	7	0
1-A	90	25	0	12	0	9	0
1-A	92	18	0	8	0	7	0
1-A	94	13	0	6	0	5	0
1-A	96	14	0	7	0	2	0
1-A	98	8	0	3	0	2	0
1-A	100	5	0	1	0	2	0
1-A	102	4	0	1	0	1	0
1-A	104	2	0	0	0	1	0
1-A	106	1	0	0	0	0	0
1-A	108	1	0	0	0	0	0
1-A	110	0	0	0	0	0	0
1-A	112	0	0	0	0	0	0
1-A	114	0	0	0	0	0	0
1-A	116	0	0	0	0	0	0

Table A.3: Albacore - region 1-B: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-CN		LL-TWOS		LL-KI		LL-KR	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
1-B	54	0	5	0	3	0	1	0	1
1-B	56	0	5	0	3	0	1	0	1
1-B	58	0	5	0	3	0	1	0	1
1-B	60	0	5	0	3	0	1	0	1
1-B	62	0	5	0	3	0	1	0	1
1-B	64	0	5	0	3	0	1	0	1
1-B	66	0	5	0	3	0	1	0	1
1-B	68	0	5	0	3	0	1	0	1
1-B	70	0	5	0	3	0	1	0	1
1-B	72	0	5	0	3	0	1	0	1
1-B	74	0	0	0	0	0	0	0	0
1-B	76	0	0	0	0	0	0	0	0
1-B	78	0	0	0	0	0	0	0	0
1-B	80	0	0	0	0	0	0	0	0
1-B	82	1	0	0	0	0	0	0	0
1-B	84	1	0	1	0	0	0	0	0
1-B	86	2	0	3	0	1	0	0	0
1-B	88	4	0	5	0	1	0	1	0
1-B	90	11	0	9	0	3	0	2	0
1-B	92	20	0	14	0	3	0	3	0
1-B	94	37	0	16	0	4	0	4	0
1-B	96	27	0	13	0	6	0	3	0
1-B	98	17	0	9	0	6	0	3	0
1-B	100	11	0	5	0	3	0	2	0
1-B	102	8	0	3	0	3	0	2	0
1-B	104	5	0	2	0	3	0	2	0
1-B	106	2	0	1	0	1	0	1	0
1-B	108	1	0	0	0	1	0	1	0
1-B	110	1	0	0	0	0	0	0	0
1-B	112	0	0	0	0	0	0	0	0
1-B	114	0	0	0	0	0	0	0	0
1-B	116	0	0	0	0	0	0	0	0
1-B	118	0	0	0	0	0	0	0	0
1-B	120	0	0	0	0	0	0	0	0
1-B	122	0	0	0	0	0	0	0	0
1-B	124	0	0	0	0	0	0	0	0
1-B	126	0	0	0	0	0	0	0	0
1-B	128	0	0	0	0	0	0	0	0
1-B	130	0	0	0	0	0	0	0	0

Table A.4: Albacore - region 2-A: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-CN		LL-FJ		LL-SB		LL-NC	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
2-A	54	0	6	0	3	0	1	0	1
2-A	56	0	6	0	3	0	1	0	1
2-A	58	0	6	0	3	0	1	0	1
2-A	60	0	6	0	3	0	1	0	1
2-A	62	0	6	0	3	0	1	0	1
2-A	64	0	6	0	3	0	1	0	1
2-A	66	0	6	0	3	0	1	0	1
2-A	68	0	6	0	3	0	1	0	1
2-A	70	0	6	0	3	0	1	0	1
2-A	72	0	6	0	3	0	1	0	1
2-A	74	0	0	0	0	0	0	0	0
2-A	76	0	0	0	0	0	0	0	0
2-A	78	1	0	0	0	0	0	0	0
2-A	80	2	0	1	0	0	0	0	0
2-A	82	5	0	1	0	0	0	0	0
2-A	84	8	0	3	0	1	0	1	0
2-A	86	12	0	5	0	3	0	1	0
2-A	88	16	0	7	0	4	0	2	0
2-A	90	22	0	11	0	4	0	3	0
2-A	92	23	0	12	0	5	0	3	0
2-A	94	23	0	12	0	4	0	4	0
2-A	96	19	0	10	0	4	0	4	0
2-A	98	14	0	7	0	2	0	3	0
2-A	100	9	0	4	0	1	0	3	0
2-A	102	5	0	2	0	0	0	2	0
2-A	104	3	0	1	0	0	0	1	0
2-A	106	2	0	0	0	0	0	0	0
2-A	108	1	0	0	0	0	0	0	0
2-A	110	1	0	0	0	0	0	0	0
2-A	112	0	0	0	0	0	0	0	0
2-A	114	0	0	0	0	0	0	0	0
2-A	116	0	0	0	0	0	0	0	0
2-A	118	0	0	0	0	0	0	0	0
2-A	120	0	0	0	0	0	0	0	0
2-A	122	0	0	0	0	0	0	0	0
2-A	124	0	0	0	0	0	0	0	0
2-A	126	0	0	0	0	0	0	0	0
2-A	128	0	0	0	0	0	0	0	0
2-A	130	0	0	0	0	0	0	0	0

Table A.5: Albacore - region 2-B: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-CN		LL-PF		LL-TWOS	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
2-B	54	0	4	0	3	0	3
2-B	56	0	4	0	3	0	3
2-B	58	0	4	0	3	0	3
2-B	60	0	4	0	3	0	3
2-B	62	0	4	0	3	0	3
2-B	64	0	4	0	3	0	3
2-B	66	0	4	0	3	0	3
2-B	68	0	4	0	3	0	3
2-B	70	0	4	0	3	0	3
2-B	72	0	4	0	3	0	3
2-B	74	0	0	0	0	0	0
2-B	76	0	0	0	0	0	0
2-B	78	0	0	0	0	0	0
2-B	80	1	0	0	0	0	0
2-B	82	1	0	0	0	0	0
2-B	84	1	0	0	0	1	0
2-B	86	2	0	1	0	1	0
2-B	88	4	0	2	0	3	0
2-B	90	7	0	6	0	5	0
2-B	92	12	0	8	0	7	0
2-B	94	17	0	10	0	12	0
2-B	96	18	0	15	0	13	0
2-B	98	18	0	19	0	11	0
2-B	100	16	0	14	0	12	0
2-B	102	12	0	9	0	7	0
2-B	104	8	0	4	0	3	0
2-B	106	5	0	2	0	1	0
2-B	108	3	0	1	0	0	0
2-B	110	2	0	0	0	0	0
2-B	112	1	0	0	0	0	0
2-B	114	0	0	0	0	0	0
2-B	116	0	0	0	0	0	0
2-B	118	0	0	0	0	0	0
2-B	120	0	0	0	0	0	0
2-B	122	0	0	0	0	0	0
2-B	124	0	0	0	0	0	0
2-B	126	0	0	0	0	0	0
2-B	128	0	0	0	0	0	0
2-B	130	0	0	0	0	0	0

Table A.6: Albacore - region 3-A: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-CN		LL-TWDW		LL-JP		LL-AU		LL-FJ	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
3-A	54	0	4	0	2	0	2	0	1	0	1
3-A	56	0	4	0	2	0	2	0	1	0	1
3-A	58	0	4	0	2	0	2	0	1	0	1
3-A	60	0	4	0	2	0	2	0	1	0	1
3-A	62	0	4	0	2	0	2	0	1	0	1
3-A	64	0	4	0	2	0	2	0	1	0	1
3-A	66	0	4	1	1	1	1	0	1	0	1
3-A	68	1	3	3	0	1	1	1	0	0	1
3-A	70	1	3	3	0	1	1	1	0	0	1
3-A	72	1	3	4	0	3	0	2	0	1	0
3-A	74	1	0	9	0	4	0	3	0	2	0
3-A	76	1	0	11	0	3	0	4	0	4	0
3-A	78	2	0	8	0	3	0	3	0	6	0
3-A	80	5	0	7	0	2	0	3	0	6	0
3-A	82	4	0	5	0	2	0	2	0	4	0
3-A	84	6	0	4	0	2	0	2	0	2	0
3-A	86	7	0	4	0	3	0	3	0	2	0
3-A	88	7	0	3	0	3	0	2	0	1	0
3-A	90	19	0	3	0	4	0	4	0	2	0
3-A	92	16	0	3	0	5	0	4	0	2	0
3-A	94	16	0	2	0	4	0	3	0	1	0
3-A	96	12	0	1	0	4	0	2	0	1	0
3-A	98	5	0	1	0	2	0	1	0	0	0
3-A	100	1	0	0	0	1	0	0	0	0	0
3-A	102	1	0	0	0	0	0	0	0	0	0
3-A	104	0	0	0	0	0	0	0	0	0	0
3-A	106	0	0	0	0	0	0	0	0	0	0
3-A	108	0	0	0	0	0	0	0	0	0	0
3-A	110	0	0	0	0	0	0	0	0	0	0
3-A	112	0	0	0	0	0	0	0	0	0	0
3-A	114	0	0	0	0	0	0	0	0	0	0
3-A	116	0	0	0	0	0	0	0	0	0	0
3-A	118	0	0	0	0	0	0	0	0	0	0
3-A	120	0	0	0	0	0	0	0	0	0	0
3-A	122	0	0	0	0	0	0	0	0	0	0
3-A	124	0	0	0	0	0	0	0	0	0	0

Table A.7: Albacore - region 3-B: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-VU		LL-TWDW		LL-CN		LL-TWOS	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
3-B	54	0	3	0	3	0	2	0	1
3-B	56	0	3	0	3	0	2	0	1
3-B	58	0	3	0	3	0	2	0	1
3-B	60	0	3	0	3	0	2	0	1
3-B	62	0	3	1	2	0	2	0	1
3-B	64	0	3	3	0	0	2	0	1
3-B	66	0	3	5	0	0	2	0	1
3-B	68	0	3	5	0	0	2	0	1
3-B	70	1	2	4	0	0	2	0	1
3-B	72	1	2	4	0	0	2	1	0
3-B	74	2	0	5	0	0	0	0	0
3-B	76	2	0	6	0	0	0	1	0
3-B	78	3	0	6	0	0	0	1	0
3-B	80	3	0	5	0	1	0	2	0
3-B	82	4	0	4	0	1	0	2	0
3-B	84	6	0	3	0	1	0	2	0
3-B	86	6	0	4	0	2	0	2	0
3-B	88	6	0	3	0	2	0	1	0
3-B	90	7	0	5	0	4	0	1	0
3-B	92	11	0	7	0	5	0	2	0
3-B	94	11	0	8	0	7	0	3	0
3-B	96	11	0	6	0	8	0	3	0
3-B	98	9	0	5	0	9	0	4	0
3-B	100	5	0	3	0	6	0	5	0
3-B	102	4	0	3	0	5	0	4	0
3-B	104	3	0	2	0	3	0	3	0
3-B	106	2	0	1	0	1	0	2	0
3-B	108	1	0	0	0	1	0	1	0
3-B	110	1	0	0	0	1	0	1	0
3-B	112	1	0	0	0	0	0	0	0
3-B	114	0	0	0	0	0	0	0	0
3-B	116	0	0	0	0	0	0	0	0
3-B	118	0	0	0	0	0	0	0	0
3-B	120	0	0	0	0	0	0	0	0
3-B	122	0	0	0	0	0	0	0	0
3-B	124	0	0	0	0	0	0	0	0
3-B	126	0	0	0	0	0	0	0	0
3-B	128	0	0	0	0	0	0	0	0
3-B	130	0	0	0	0	0	0	0	0

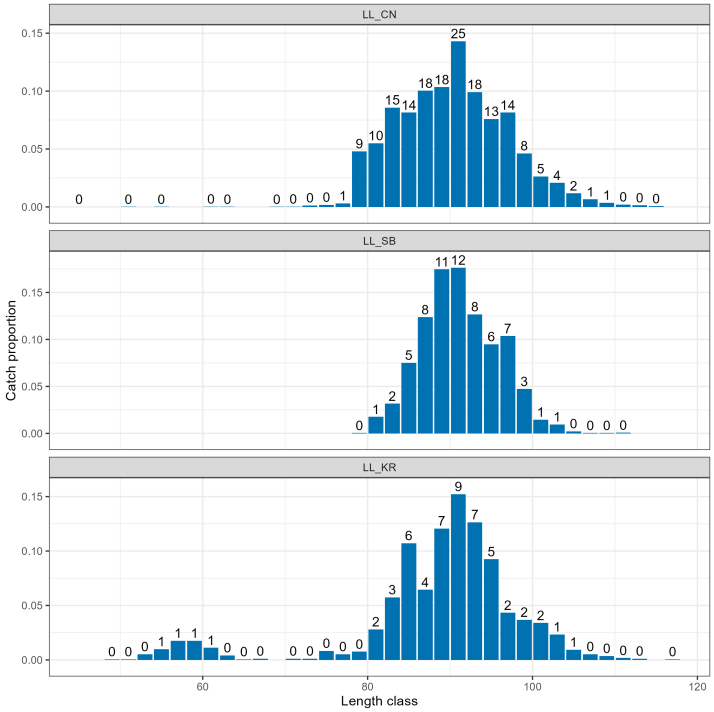


Figure A.2: The estimated length composition of albacore catches in region 1-A per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

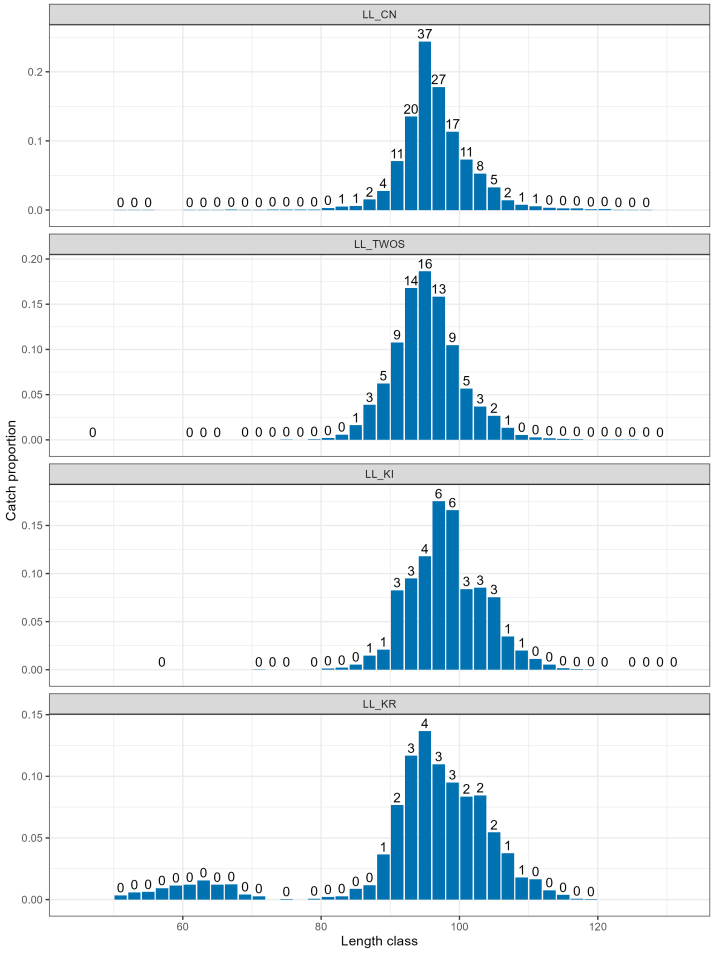


Figure A.3: The estimated length composition of albacore catches in region 1-B per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

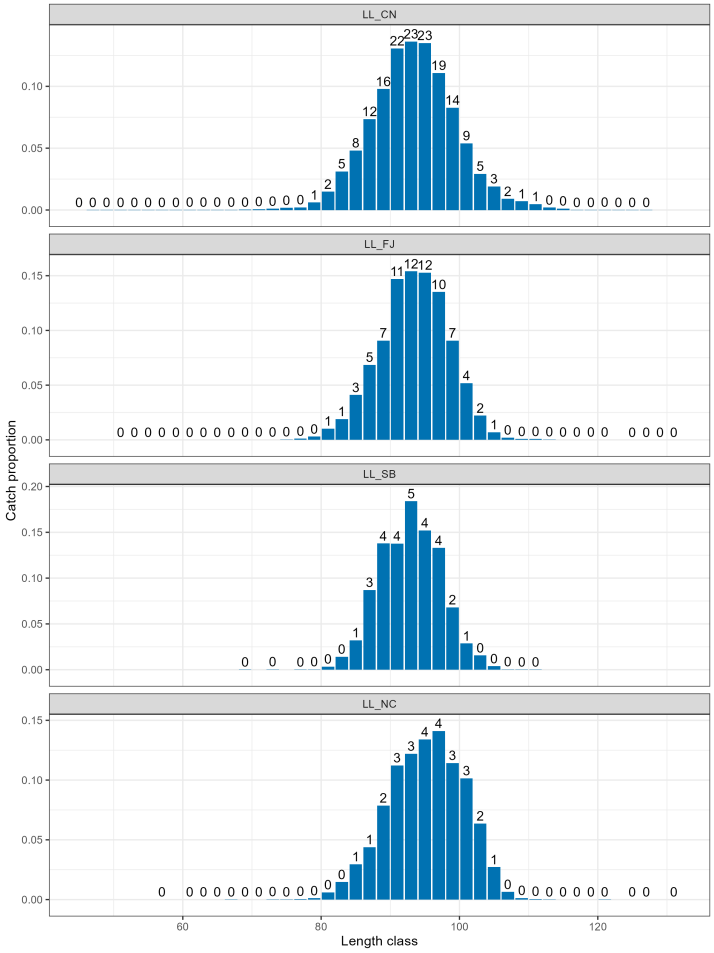


Figure A.4: The estimated length composition of albacore catches in region 2-A per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

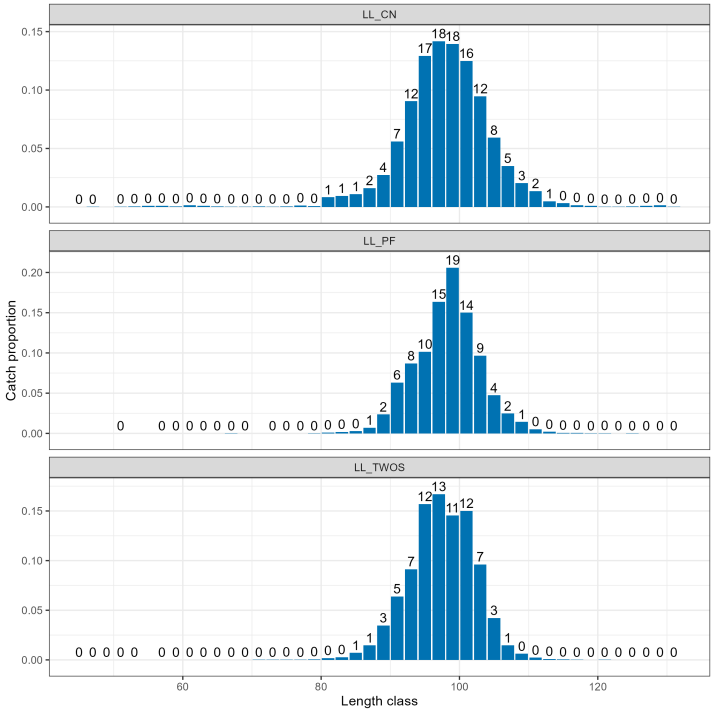


Figure A.5: The estimated length composition of albacore catches in region 2-B per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

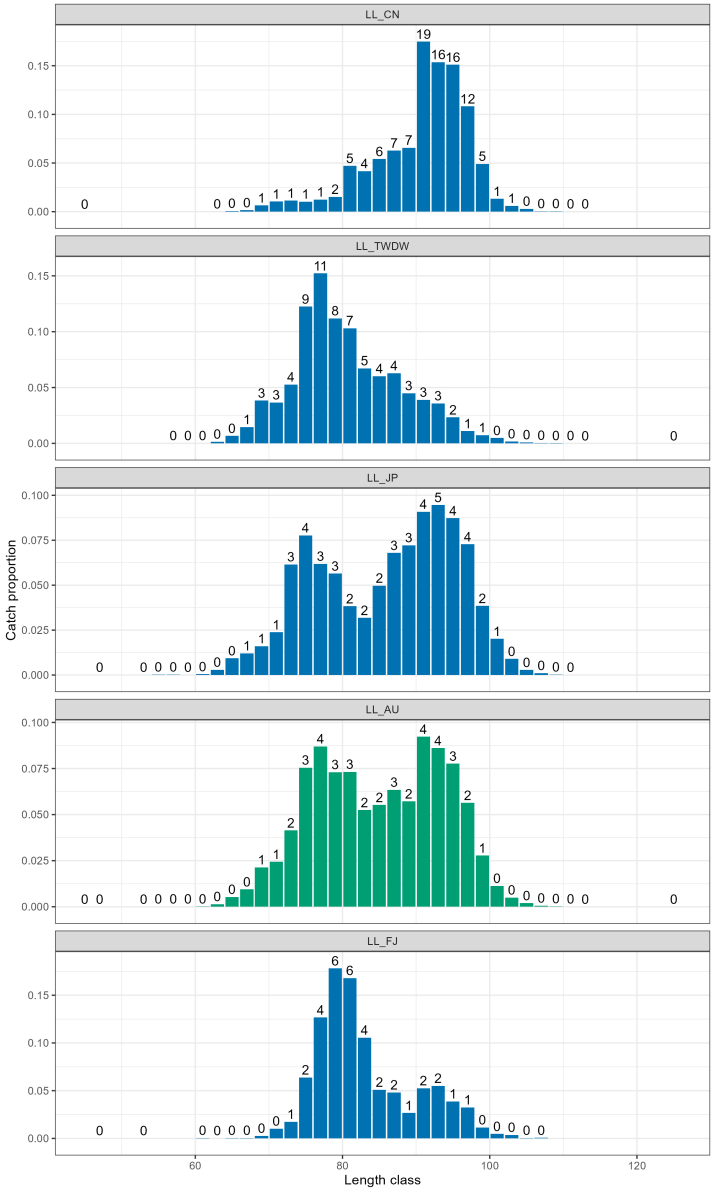


Figure A.6: The estimated length composition of albacore catches in region 3-A per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

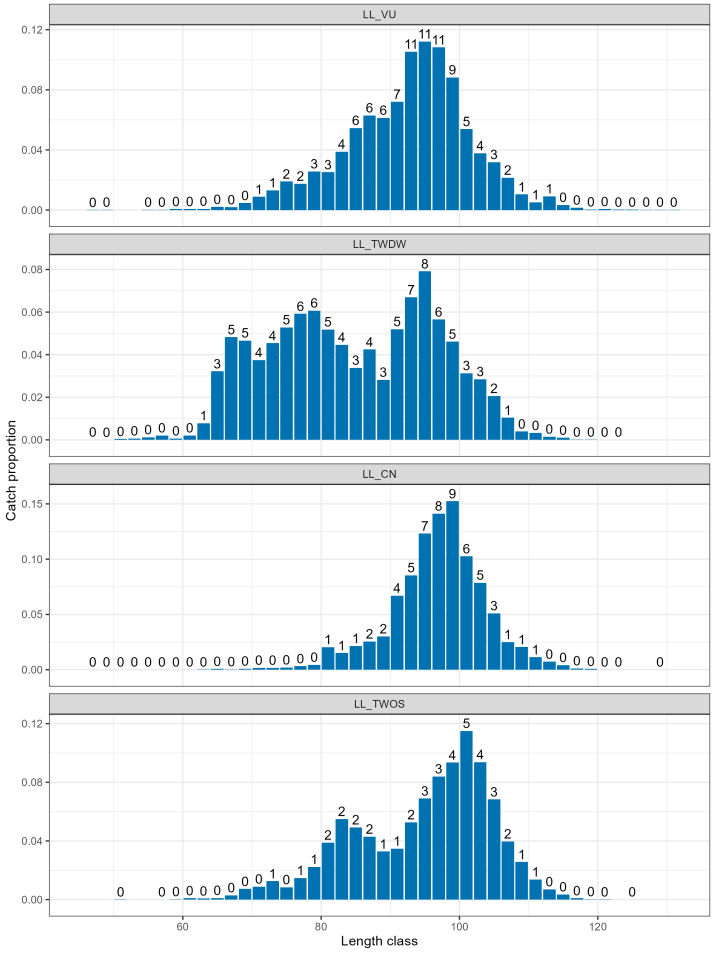


Figure A.7: The estimated length composition of albacore catches in region 3-B per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

Table A.8: Albacore: comparisons of target sample sizes for estimation of growth (Tar. growth, n) and maturity (Tar., mat., n) against available samples in the Pacific Marine Specimen Bank (PMSB growth and PMSB mat.), per region (Reg.).

Reg.	Tar. growth (n)	PMSB growth (n)	Tar. mat. (n)	PMSB mat. (n)
1-A	296	1	392	1
1-B	288	0	388	9
2-A	297	1150	407	1496
2-B	295	136	395	162
3-A	300	0	381	0
3-B	296	0	367	0

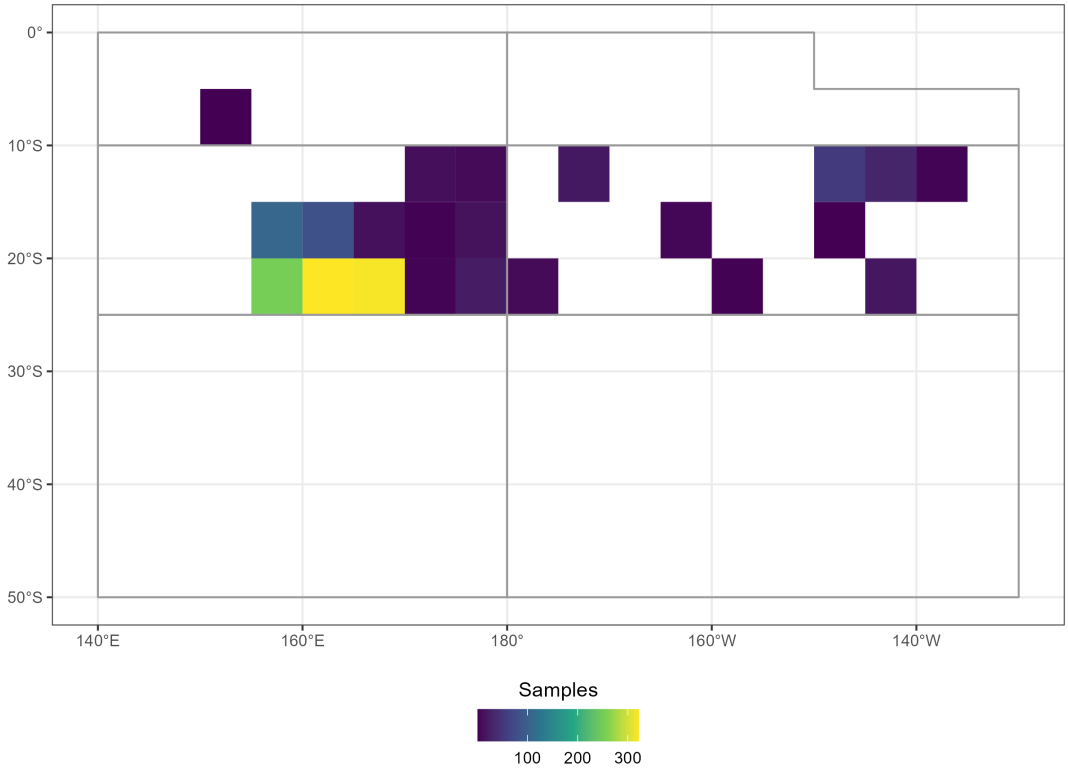


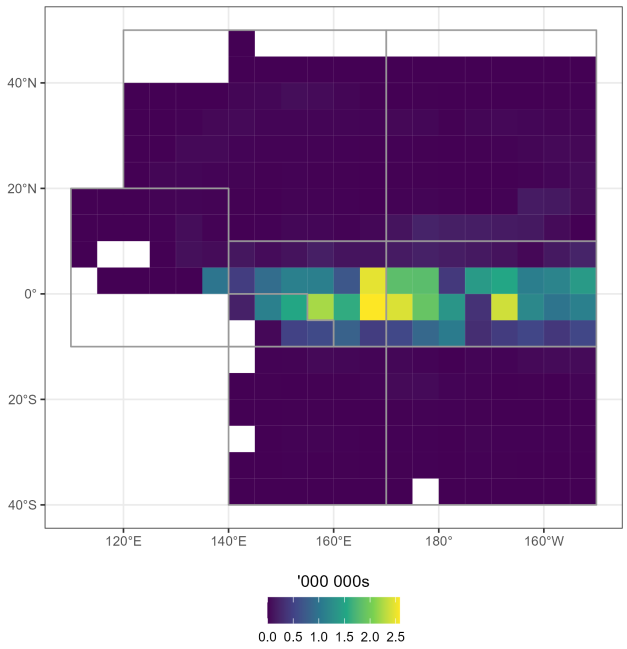
Figure A.8: Albacore: Spatial distributions of available otoliths in the Pacific Marine Specimen Bank for estimation of age and growth for the period 2020–2024.

Table A.9: Albacore: comparisons of target sample sizes for estimation of growth (Tar, n) against available samples in the Pacific Marine Specimen Bank (PMSB, n) by length class (Len., cm) for selected regions (2-A, 2-B).

Len. (cm)	2-A		2-B	
	Tar.	PMSB	Tar.	PMSB
54	0	0	0	0
56	0	0	0	0
58	0	1	0	0
60	0	0	0	0
62	0	0	0	0
64	0	1	0	0
66	0	0	0	0
68	0	1	0	0
70	0	0	0	0
72	0	0	0	0
74	0	1	0	0
76	0	5	0	0
78	1	9	0	2
80	3	19	1	0
82	6	13	1	2
84	13	42	2	8
86	21	35	4	4
88	29	52	9	22
90	40	125	18	22
92	43	158	27	11
94	43	161	39	14
96	37	179	46	9
98	26	140	48	12
100	17	101	42	8
102	9	58	28	8
104	5	32	15	12
106	2	7	8	1
108	1	2	4	1
110	1	2	2	0
112	0	0	1	0
114	0	2	0	0
116	0	0	0	0
118	0	0	0	0
120	0	4	0	0
122	0	0	0	0
124	0	0	0	0
126	0	0	0	0
128	0	0	0	0
130	0	0	0	0

B Bigeye tuna

(a) Total reported catch



(b) Catch from sampled fleet-region combinations

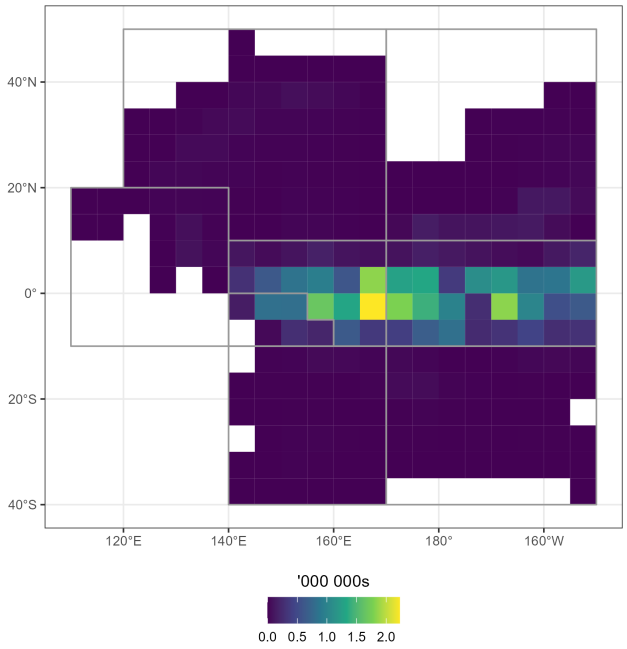


Figure B.1: Bigeye tuna: Spatial distributions of a) total reported catches and b) reported catch from sampled fleet-region combinations from 2020–2024, with sampling as per the developed biological sampling plan.

Table B.1: Bigeye tuna: average annual catch (thousands), available length samples for estimation of length frequencies (LF samples, individuals), target biological sampling rate (Bio. samples, individuals), and maximum supplemental samples for estimation of maturity per length class (Mat. samples, individuals), per region (Reg.) and fleet (LL prefix denotes longline, FS prefix denotes purse seine fishing on free-schools, ASS prefix denotes purse seine fishing on associated schools, see Section 2).

Reg.	Fleet	Catch ('000s)	LF samples (n)	Bio. samples (n)	Mat. samples (n)
1	LL-JP	123	8861	274	9
1	LL-TWOS	12	2210	26	1
2	LL-KR	110	36877	160	5
2	LL-USHW	96	46591	140	5
3	ASS-TW	650	6269	59	3
3	ASS-FM	448	6085	40	2
3	ASS-KI	384	3933	35	2
3	ASS-NR	275	4380	25	1
3	ASS-JP	235	2649	21	1
3	ASS-KR	226	1862	20	1
3	LL-JP	34	3952	42	0
3	LL-FM	34	24773	42	0
3	LL-TWOS	32	8604	39	0
3	LL-KR	27	12984	33	0
3	LL-MH	21	61253	26	0
3	LL-SB	16	169	19	0
4	ASS-KI	1165	17250	61	3
4	ASS-US	1152	19270	60	3
4	ASS-ES	646	2130	34	2
4	ASS-KR	482	8715	25	1
4	ASS-MH	399	4577	21	1
4	LL-KR	216	64777	129	0
4	LL-CN	62	9509	37	0
4	LL-KI	57	17136	34	0
5	LL-CN	16	4887	125	4
5	LL-AU	9	0	72	2
5	LL-SB	9	100	69	2
5	LL-JP	4	535	33	1
6	LL-CN	41	4806	209	7
6	LL-FJ	18	18051	91	3
7	LL-JP	31	4246	205	7
7	LL-TWOS	10	1163	64	2
7	ASS-JP	5	31	31	1
8	FS-PG	153	3923	70	3
8	ASS-PG	119	3477	54	3
8	ASS-TW	86	683	39	2
8	ASS-JP	82	362	37	2
8	LL-SB	7	56	76	0
8	LL-CN	6	2601	63	0
8	LL-JP	4	375	40	0
8	LL-PG	2	0	21	0

Table B.2: Bigeye tuna - region 1: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-JP		LL-TWOS	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)
1	15	0	9	0	1
1	20	0	9	0	1
1	25	0	9	0	1
1	30	0	9	0	1
1	35	0	9	0	1
1	40	0	9	0	1
1	45	0	9	0	1
1	50	0	9	0	1
1	55	0	9	0	1
1	60	2	7	0	1
1	65	4	5	0	1
1	70	3	6	0	1
1	75	2	7	0	1
1	80	2	7	1	0
1	85	3	6	1	0
1	90	6	3	4	0
1	95	9	0	3	0
1	100	8	1	3	0
1	105	8	0	3	0
1	110	16	0	2	0
1	115	34	0	2	0
1	120	35	0	2	0
1	125	16	0	1	0
1	130	14	0	1	0
1	135	25	0	1	0
1	140	27	0	0	0
1	145	19	0	0	0
1	150	15	0	0	0
1	155	11	0	0	0
1	160	8	0	0	0
1	165	5	0	0	0
1	170	2	0	0	0
1	175	1	0	0	0
1	180	0	0	0	0
1	185	0	0	0	0
1	190	0	0	0	0

Table B.3: Bigeye tuna - region 2: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-KR		LL-USHW	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)
2	15	0	5	0	5
2	20	0	5	0	5
2	25	0	5	0	5
2	30	0	5	0	5
2	35	0	5	0	5
2	40	0	5	0	5
2	45	0	5	0	5
2	50	0	5	0	5
2	55	0	5	1	4
2	60	0	5	2	3
2	65	0	5	3	2
2	70	0	5	3	2
2	75	0	5	3	2
2	80	0	5	4	1
2	85	1	4	4	1
2	90	1	4	8	0
2	95	2	3	9	0
2	100	4	1	10	0
2	105	6	0	10	0
2	110	10	0	10	0
2	115	12	0	11	0
2	120	14	0	12	0
2	125	13	0	14	0
2	130	16	0	12	0
2	135	17	0	9	0
2	140	16	0	6	0
2	145	13	0	4	0
2	150	11	0	2	0
2	155	8	0	1	0
2	160	6	0	1	0
2	165	4	0	0	0
2	170	3	0	0	0
2	175	2	0	0	0
2	180	1	0	0	0
2	185	1	0	0	0
2	190	0	0	0	0
2	195	0	0	0	0
2	200	0	0	0	0
2	205	0	0	0	0
2	210	0	0	0	0

Table B.4: Bigeye tuna - region 3: target biological samples and supplemental samples for maturity estimation, per purse seine fleet (ASS prefix denotes associated schools, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	ASS-TW		ASS-FM		ASS-KI		ASS-NR		ASS-JP		ASS-KR	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
3	15	0	3	0	2	0	2	0	1	0	1	0	1
3	20	0	3	0	2	0	2	0	1	0	1	0	1
3	25	0	3	0	2	0	2	0	1	0	1	0	1
3	30	2	1	0	2	1	1	0	1	0	1	0	1
3	35	3	0	1	1	1	1	1	0	0	1	1	0
3	40	4	0	2	0	3	0	1	0	1	0	2	0
3	45	8	0	4	0	6	0	3	0	2	0	3	0
3	50	8	0	6	0	6	0	2	0	3	0	3	0
3	55	8	0	7	0	5	0	2	0	3	0	3	0
3	60	6	0	6	0	4	0	2	0	3	0	2	0
3	65	6	0	4	0	3	0	2	0	3	0	1	0
3	70	3	0	2	0	2	0	1	0	2	0	1	0
3	75	3	0	2	0	1	1	2	0	2	0	1	0
3	80	3	0	2	0	1	1	2	0	1	0	1	0
3	85	2	1	2	0	1	1	2	0	1	0	1	0
3	90	1	2	1	1	0	2	1	0	0	1	0	1
3	95	1	2	1	1	0	2	1	0	0	1	0	1
3	100	1	2	0	2	0	2	1	0	0	1	0	1
3	105	0	0	0	0	0	0	0	0	0	0	0	0
3	110	0	0	0	0	0	0	0	0	0	0	0	0
3	115	0	0	0	0	0	0	0	0	0	0	0	0
3	120	0	0	0	0	0	0	0	0	0	0	0	0
3	125	0	0	0	0	0	0	0	0	0	0	0	0
3	130	0	0	0	0	0	0	0	0	0	0	0	0
3	135	0	0	0	0	0	0	0	0	0	0	0	0
3	140	0	0	0	0	0	0	0	0	0	0	0	0
3	145	0	0	0	0	0	0	0	0	0	0	0	0
3	150	0	0	0	0	0	0	0	0	0	0	0	0
3	155	0	0	0	0	0	0	0	0	0	0	0	0
3	160	0	0	0	0	0	0	0	0	0	0	0	0
3	165	0	0	0	0	0	0	0	0	0	0	0	0
3	170	0	0	0	0	0	0	0	0	0	0	0	0
3	175	0	0	0	0	0	0	0	0	0	0	0	0
3	180	0	0	0	0	0	0	0	0	0	0	0	0
3	185	0	0	0	0	0	0	0	0	0	0	0	0
3	190	0	0	0	0	0	0	0	0	0	0	0	0
3	195	0	0	0	0	0	0	0	0	0	0	0	0

Table B.5: Bigeye tuna - region 3: target biological samples and supplemental samples for maturity estimation, per longline fleet and length class (Len., cm).

Reg.	Len. (cm)	LL-JP		LL-FM		LL-TWOS		LL-KR		LL-MH		LL-SB	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
3	15	0	0	0	0	0	0	0	0	0	0	0	0
3	20	0	0	0	0	0	0	0	0	0	0	0	0
3	25	0	0	0	0	0	0	0	0	0	0	0	0
3	30	0	0	0	0	0	0	0	0	0	0	0	0
3	35	0	0	0	0	0	0	0	0	0	0	0	0
3	40	0	0	0	0	0	0	0	0	0	0	0	0
3	45	0	0	0	0	0	0	0	0	0	0	0	0
3	50	0	0	0	0	0	0	0	0	0	0	0	0
3	55	0	0	0	0	0	0	0	0	0	0	0	0
3	60	0	0	0	0	0	0	0	0	0	0	0	0
3	65	0	0	0	0	0	0	0	0	0	0	0	0
3	70	0	0	0	0	0	0	0	0	0	0	0	0
3	75	0	0	0	0	0	0	0	0	0	0	0	0
3	80	0	0	0	0	1	0	0	0	0	0	0	0
3	85	0	0	1	0	1	0	0	0	0	0	0	0
3	90	1	0	1	0	2	0	1	0	1	0	0	0
3	95	2	0	1	0	2	0	1	0	1	0	1	0
3	100	2	0	2	0	2	0	1	0	1	0	1	0
3	105	3	0	4	0	2	0	2	0	2	0	2	0
3	110	6	0	5	0	3	0	2	0	3	0	2	0
3	115	6	0	5	0	4	0	2	0	3	0	2	0
3	120	6	0	7	0	4	0	3	0	4	0	3	0
3	125	5	0	5	0	5	0	4	0	3	0	2	0
3	130	4	0	5	0	5	0	4	0	4	0	3	0
3	135	3	0	3	0	3	0	4	0	2	0	2	0
3	140	2	0	2	0	2	0	4	0	1	0	1	0
3	145	0	0	0	0	1	0	2	0	0	0	0	0
3	150	0	0	0	0	1	0	1	0	0	0	0	0
3	155	0	0	0	0	0	0	0	0	0	0	0	0
3	160	0	0	0	0	0	0	0	0	0	0	0	0
3	165	0	0	0	0	0	0	0	0	0	0	0	0
3	170	0	0	0	0	0	0	0	0	0	0	0	0
3	175	0	0	0	0	0	0	0	0	0	0	0	0
3	180	0	0	0	0	0	0	0	0	0	0	0	0
3	185	0	0	0	0	0	0	0	0	0	0	0	0
3	190	0	0	0	0	0	0	0	0	0	0	0	0

Table B.6: Bigeye tuna - region 4: target biological samples and supplemental samples for maturity estimation, per purse seine fleet (ASS prefix denotes associated schools, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	ASS-KI		ASS-US		ASS-ES		ASS-KR		ASS-MH	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
4	15	0	3	0	3	0	2	0	1	0	1
4	20	0	3	0	3	0	2	0	1	0	1
4	25	0	3	0	3	0	2	0	1	0	1
4	30	1	2	0	3	0	2	1	0	1	0
4	35	2	1	2	1	3	0	2	0	1	0
4	40	6	0	5	0	7	0	3	0	2	0
4	45	11	0	11	0	8	0	5	0	4	0
4	50	10	0	10	0	4	0	5	0	3	0
4	55	10	0	8	0	3	0	4	0	3	0
4	60	6	0	5	0	2	0	2	0	2	0
4	65	5	0	5	0	2	0	1	0	2	0
4	70	3	0	3	0	2	0	0	1	1	0
4	75	2	1	3	0	1	1	1	0	0	1
4	80	1	2	2	1	0	2	0	1	0	1
4	85	1	2	1	2	0	2	0	1	0	1
4	90	1	2	1	2	0	2	0	1	0	1
4	95	0	3	0	3	0	2	0	1	0	1
4	100	0	3	0	3	0	2	0	1	0	1
4	105	0	0	0	0	0	0	0	0	0	0
4	110	0	0	0	0	0	0	0	0	0	0
4	115	0	0	0	0	0	0	0	0	0	0
4	120	0	0	0	0	0	0	0	0	0	0
4	125	0	0	0	0	0	0	0	0	0	0
4	130	0	0	0	0	0	0	0	0	0	0
4	135	0	0	0	0	0	0	0	0	0	0
4	140	0	0	0	0	0	0	0	0	0	0
4	145	0	0	0	0	0	0	0	0	0	0
4	150	0	0	0	0	0	0	0	0	0	0
4	155	0	0	0	0	0	0	0	0	0	0
4	160	0	0	0	0	0	0	0	0	0	0
4	165	0	0	0	0	0	0	0	0	0	0
4	170	0	0	0	0	0	0	0	0	0	0
4	175	0	0	0	0	0	0	0	0	0	0
4	180	0	0	0	0	0	0	0	0	0	0

Table B.7: Bigeye tuna - region 4: target biological samples and supplemental samples for maturity estimation, per longline fleet and length class (Len., cm).

Reg.	Len. (cm)	LL-KR		LL-CN		LL-KI	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
4	15	0	0	0	0	0	0
4	20	0	0	0	0	0	0
4	25	0	0	0	0	0	0
4	30	0	0	0	0	0	0
4	35	0	0	0	0	0	0
4	40	0	0	0	0	0	0
4	45	0	0	0	0	0	0
4	50	0	0	0	0	0	0
4	55	0	0	0	0	0	0
4	60	0	0	0	0	0	0
4	65	0	0	0	0	0	0
4	70	1	0	1	0	0	0
4	75	1	0	1	0	0	0
4	80	1	0	1	0	0	0
4	85	1	0	1	0	0	0
4	90	1	0	2	0	1	0
4	95	1	0	3	0	1	0
4	100	2	0	4	0	1	0
4	105	3	0	4	0	2	0
4	110	5	0	4	0	2	0
4	115	6	0	4	0	2	0
4	120	9	0	4	0	4	0
4	125	11	0	2	0	3	0
4	130	15	0	2	0	4	0
4	135	17	0	1	0	3	0
4	140	17	0	1	0	4	0
4	145	13	0	1	0	2	0
4	150	9	0	1	0	1	0
4	155	5	0	0	0	1	0
4	160	3	0	0	0	0	0
4	165	2	0	0	0	0	0
4	170	2	0	0	0	0	0
4	175	1	0	0	0	0	0
4	180	1	0	0	0	0	0
4	185	0	0	0	0	0	0
4	190	0	0	0	0	0	0
4	195	0	0	0	0	0	0
4	200	0	0	0	0	0	0
4	205	0	0	0	0	0	0
4	210	0	0	0	0	0	0

Table B.8: Bigeye tuna - region 5: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-CN		LL-AU		LL-SB		LL-JP	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
5	15	0	4	0	2	0	2	0	1
5	20	0	4	0	2	0	2	0	1
5	25	0	4	0	2	0	2	0	1
5	30	0	4	0	2	0	2	0	1
5	35	0	4	0	2	0	2	0	1
5	40	0	4	0	2	0	2	0	1
5	45	0	4	0	2	0	2	0	1
5	50	1	3	0	2	0	2	0	1
5	55	1	3	1	1	0	2	0	1
5	60	2	2	1	1	1	1	1	0
5	65	3	1	2	0	2	0	1	0
5	70	6	0	4	0	4	0	2	0
5	75	6	0	3	0	3	0	2	0
5	80	6	0	3	0	3	0	2	0
5	85	9	0	5	0	5	0	2	0
5	90	9	0	5	0	5	0	2	0
5	95	8	0	5	0	5	0	2	0
5	100	9	0	5	0	5	0	2	0
5	105	9	0	5	0	5	0	2	0
5	110	10	0	6	0	5	0	3	0
5	115	10	0	5	0	5	0	2	0
5	120	8	0	5	0	4	0	2	0
5	125	7	0	4	0	4	0	2	0
5	130	5	0	3	0	3	0	1	0
5	135	4	0	2	0	2	0	1	0
5	140	4	0	2	0	2	0	1	0
5	145	2	0	1	0	1	0	1	0
5	150	1	0	1	0	1	0	0	0
5	155	1	0	1	0	1	0	0	0
5	160	1	0	1	0	1	0	0	0
5	165	1	0	1	0	1	0	0	0
5	170	0	0	0	0	0	0	0	0
5	175	0	0	0	0	0	0	0	0
5	180	0	0	0	0	0	0	0	0
5	185	0	0	0	0	0	0	0	0
5	190	0	0	0	0	0	0	0	0
5	195	0	0	0	0	0	0	0	0
5	200	0	0	0	0	0	0	0	0
5	205	0	0	0	0	0	0	0	0

Table B.9: Bigeye tuna - region 6: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-CN		LL-FJ	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)
6	15	0	7	0	3
6	20	0	7	0	3
6	25	0	7	0	3
6	30	0	7	0	3
6	35	0	7	0	3
6	40	1	6	0	3
6	45	1	6	0	3
6	50	2	5	0	3
6	55	2	5	1	2
6	60	6	1	1	2
6	65	10	0	1	2
6	70	11	0	2	1
6	75	13	0	2	1
6	80	19	0	4	0
6	85	18	0	9	0
6	90	22	0	11	0
6	95	18	0	10	0
6	100	16	0	9	0
6	105	12	0	9	0
6	110	10	0	7	0
6	115	10	0	6	0
6	120	10	0	5	0
6	125	7	0	4	0
6	130	6	0	3	0
6	135	4	0	2	0
6	140	4	0	2	0
6	145	3	0	1	0
6	150	2	0	0	0
6	155	1	0	0	0
6	160	1	0	0	0
6	165	1	0	0	0
6	170	0	0	0	0
6	175	0	0	0	0
6	180	0	0	0	0
6	185	0	0	0	0
6	190	0	0	0	0
6	195	0	0	0	0

Table B.10: Bigeye tuna - region 7: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, ASS prefix denotes purse seine fishing on associated schools, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-JP		LL-TWOS		ASS-JP	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
7	15	0	7	0	2	0	1
7	20	0	7	0	2	0	1
7	25	0	7	0	2	1	0
7	30	0	7	0	2	2	0
7	35	0	7	0	2	4	0
7	40	0	7	0	2	4	0
7	45	0	7	0	2	4	0
7	50	1	6	0	2	4	0
7	55	1	6	0	2	3	0
7	60	1	6	0	2	3	0
7	65	1	6	0	2	2	0
7	70	3	4	0	2	1	0
7	75	4	3	0	2	1	0
7	80	3	4	1	1	0	1
7	85	4	3	1	1	0	1
7	90	5	2	1	1	0	1
7	95	11	0	1	1	0	1
7	100	20	0	2	0	0	1
7	105	15	0	3	0	0	0
7	110	14	0	5	0	0	0
7	115	20	0	7	0	0	0
7	120	26	0	7	0	0	0
7	125	22	0	8	0	0	0
7	130	18	0	8	0	0	0
7	135	13	0	7	0	0	0
7	140	10	0	7	0	0	0
7	145	8	0	4	0	0	0
7	150	3	0	1	0	0	0
7	155	2	0	0	0	0	0
7	160	0	0	0	0	0	0
7	165	0	0	0	0	0	0
7	170	0	0	0	0	0	0
7	175	0	0	0	0	0	0
7	180	0	0	0	0	0	0
7	185	0	0	0	0	0	0

Table B.11: Bigeye tuna - region 8: target biological samples and supplemental samples for maturity estimation, per purse seine fleet (FS prefix denotes free-schools, ASS prefix denotes associated schools, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	FS-PG		ASS-PG		ASS-TW		ASS-JP	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
8	15	0	3	0	3	0	2	0	2
8	20	0	3	0	3	0	2	0	2
8	25	0	3	0	3	0	2	0	2
8	30	0	3	0	3	0	2	0	2
8	35	1	2	1	2	1	1	1	1
8	40	2	1	3	0	2	0	2	0
8	45	6	0	6	0	4	0	4	0
8	50	11	0	7	0	5	0	5	0
8	55	11	0	8	0	6	0	6	0
8	60	7	0	8	0	6	0	5	0
8	65	6	0	6	0	4	0	4	0
8	70	5	0	3	0	2	0	2	0
8	75	4	0	3	0	2	0	2	0
8	80	4	0	3	0	2	0	2	0
8	85	4	0	2	1	1	1	1	1
8	90	2	1	1	2	1	1	1	1
8	95	2	1	1	2	1	1	1	1
8	100	2	1	1	2	1	1	1	1
8	105	1	0	0	0	0	0	0	0
8	110	0	0	0	0	0	0	0	0
8	115	0	0	0	0	0	0	0	0
8	120	0	0	0	0	0	0	0	0
8	125	0	0	0	0	0	0	0	0
8	130	0	0	0	0	0	0	0	0
8	135	0	0	0	0	0	0	0	0
8	140	0	0	0	0	0	0	0	0
8	145	0	0	0	0	0	0	0	0
8	150	0	0	0	0	0	0	0	0
8	155	0	0	0	0	0	0	0	0
8	160	0	0	0	0	0	0	0	0
8	165	0	0	0	0	0	0	0	0
8	170	0	0	0	0	0	0	0	0
8	175	0	0	0	0	0	0	0	0
8	180	0	0	0	0	0	0	0	0
8	185	0	0	0	0	0	0	0	0

Table B.12: Bigeye tuna - region 8: target biological samples and supplemental samples for maturity estimation, per longline fleet and length class (Len., cm).

Reg.	Len. (cm)	LL-SB		LL-CN		LL-JP		LL-PG	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
8	15	0	0	0	0	0	0	0	0
8	20	0	0	0	0	0	0	0	0
8	25	0	0	0	0	0	0	0	0
8	30	0	0	0	0	0	0	0	0
8	35	0	0	0	0	0	0	0	0
8	40	0	0	0	0	0	0	0	0
8	45	0	0	0	0	0	0	0	0
8	50	0	0	0	0	0	0	0	0
8	55	0	0	0	0	0	0	0	0
8	60	0	0	0	0	0	0	0	0
8	65	0	0	0	0	0	0	0	0
8	70	0	0	0	0	0	0	0	0
8	75	0	0	0	0	0	0	0	0
8	80	0	0	0	0	0	0	0	0
8	85	1	0	1	0	1	0	0	0
8	90	2	0	1	0	1	0	0	0
8	95	3	0	2	0	1	0	1	0
8	100	6	0	4	0	3	0	2	0
8	105	5	0	4	0	3	0	1	0
8	110	6	0	5	0	3	0	2	0
8	115	9	0	7	0	5	0	2	0
8	120	9	0	8	0	5	0	3	0
8	125	8	0	6	0	4	0	2	0
8	130	7	0	7	0	4	0	2	0
8	135	5	0	5	0	3	0	2	0
8	140	4	0	4	0	2	0	1	0
8	145	2	0	2	0	1	0	1	0
8	150	2	0	2	0	1	0	1	0
8	155	2	0	2	0	1	0	1	0
8	160	1	0	1	0	1	0	0	0
8	165	1	0	1	0	1	0	0	0
8	170	1	0	1	0	0	0	0	0
8	175	0	0	0	0	0	0	0	0
8	180	0	0	0	0	0	0	0	0
8	185	0	0	0	0	0	0	0	0
8	190	0	0	0	0	0	0	0	0
8	195	0	0	0	0	0	0	0	0
8	200	0	0	0	0	0	0	0	0
8	205	0	0	0	0	0	0	0	0

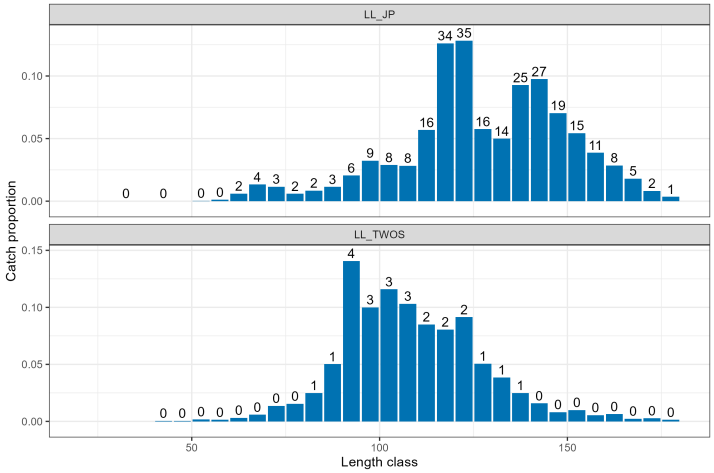


Figure B.2: The estimated length composition of bigeye tuna catches in region 1 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

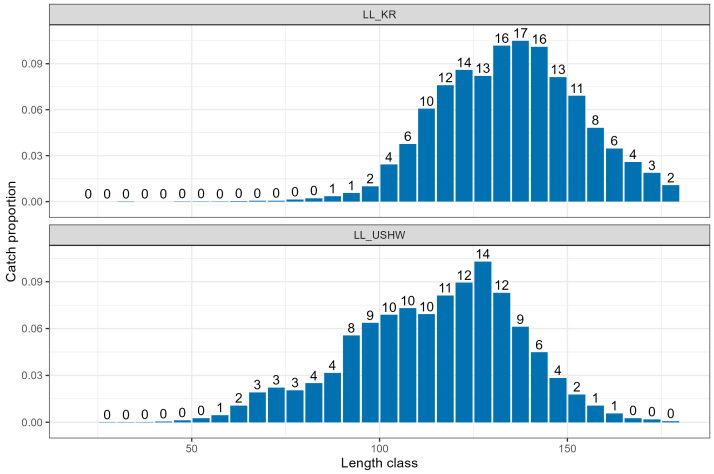


Figure B.3: The estimated length composition of bigeye tuna catches in region 2 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

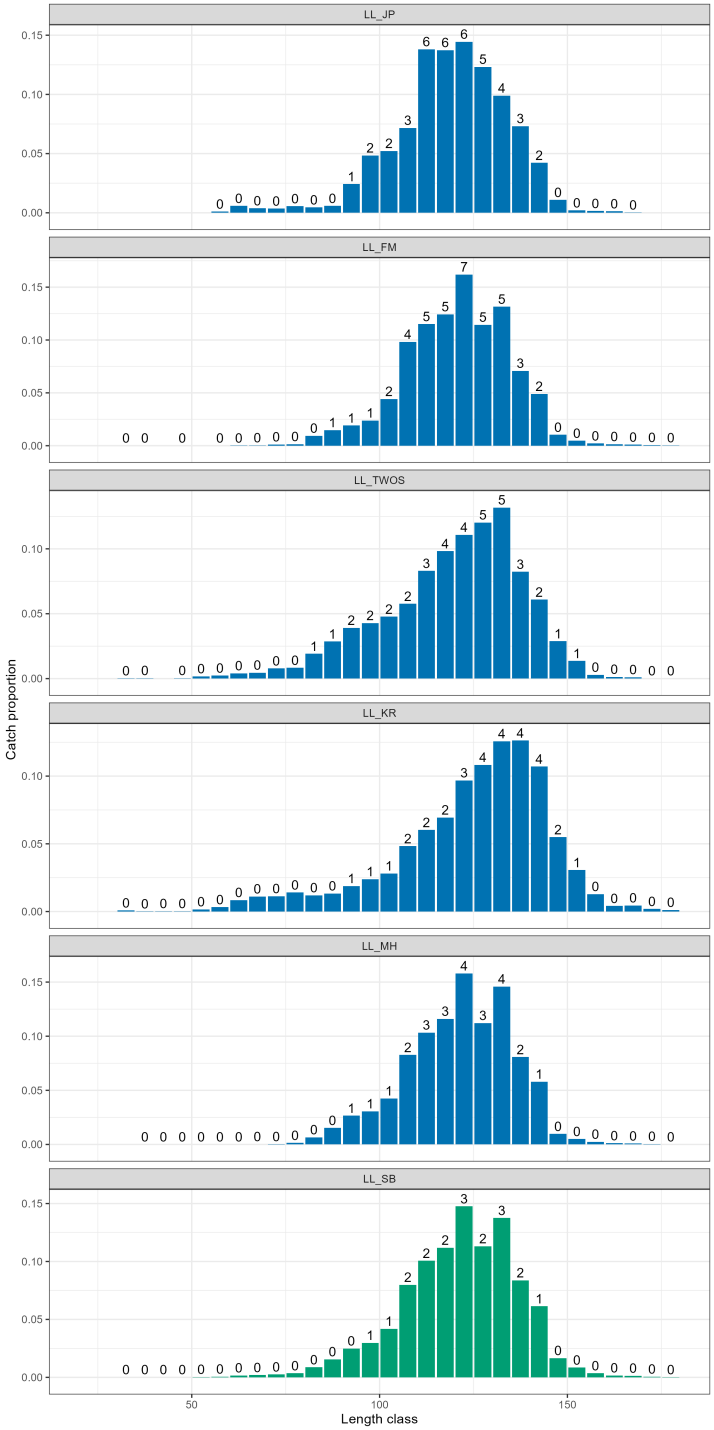


Figure B.4: The estimated length composition of bigeye tuna catches in region 3 per longline sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

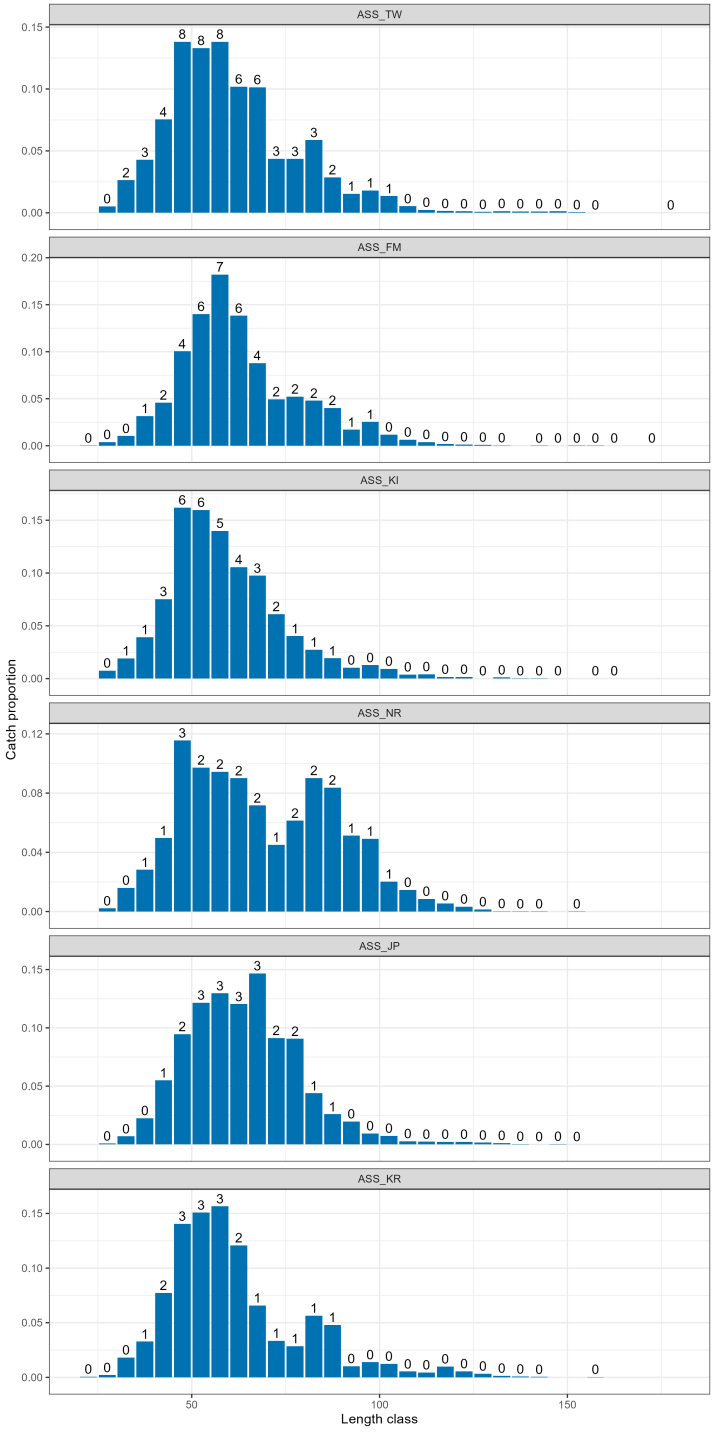


Figure B.5: The estimated length composition of bigeye tuna catches in region 3 per purse seine sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

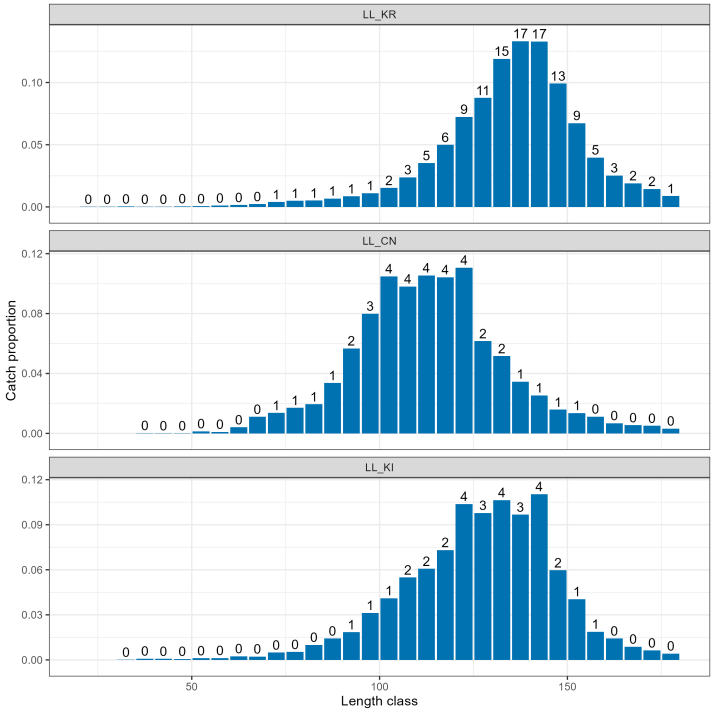


Figure B.6: The estimated length composition of bigeye tuna catches in region 4 per longline sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

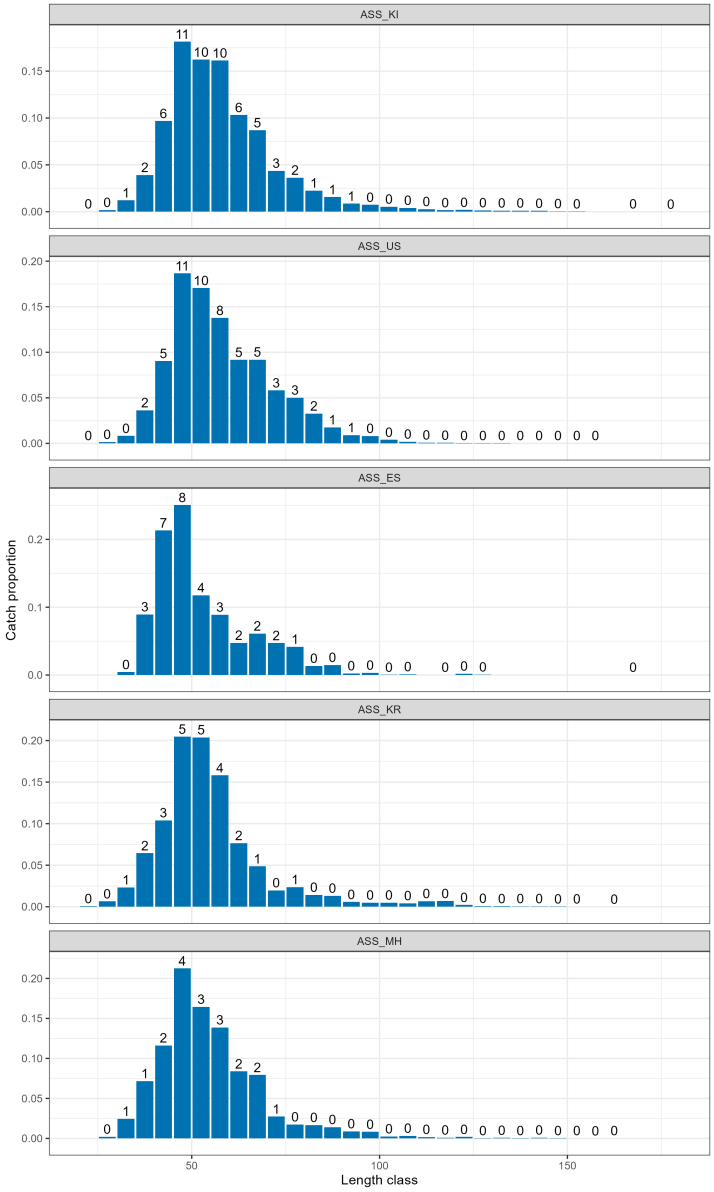


Figure B.7: The estimated length composition of bigeye tuna catches in region 4 per purse seine sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

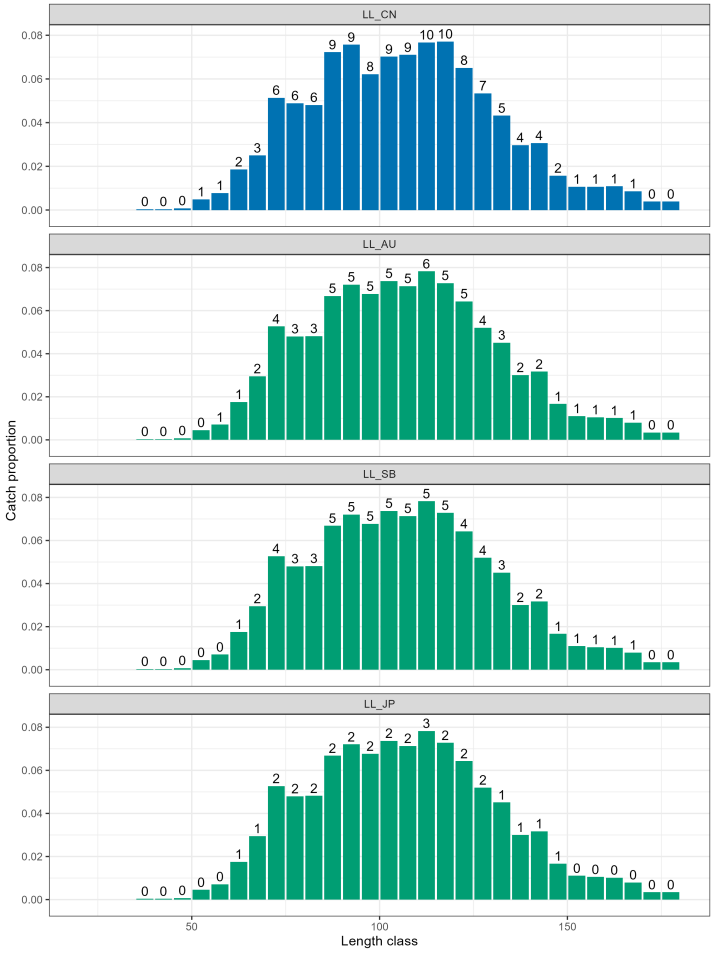


Figure B.8: The estimated length composition of bigeye tuna catches in region 5 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

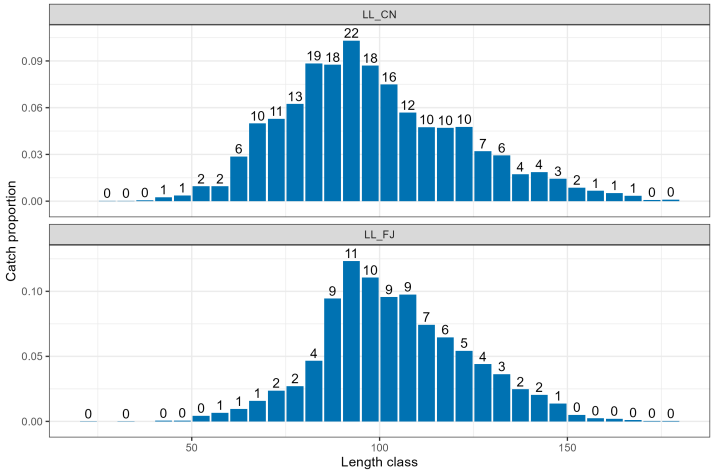


Figure B.9: The estimated length composition of bigeye tuna catches in region 6 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

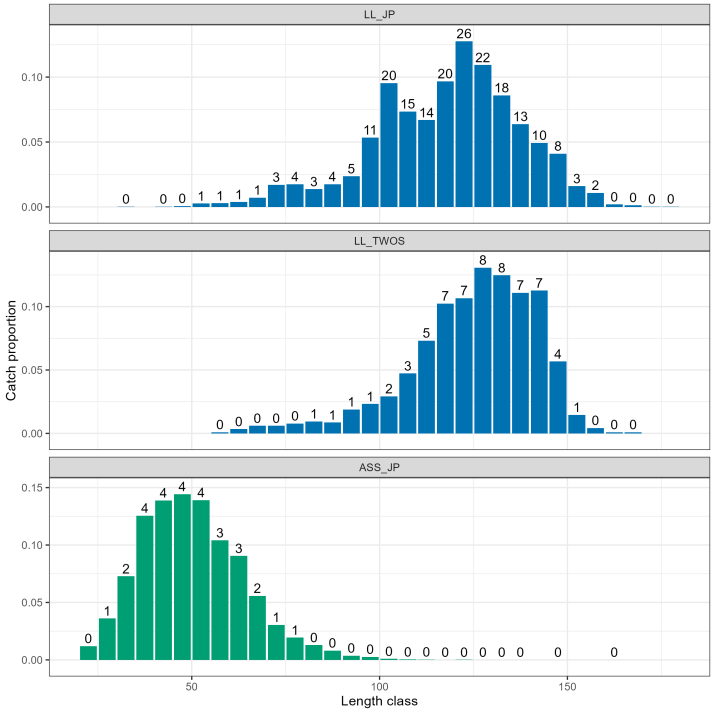


Figure B.10: The estimated length composition of bigeye tuna catches in region 7 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

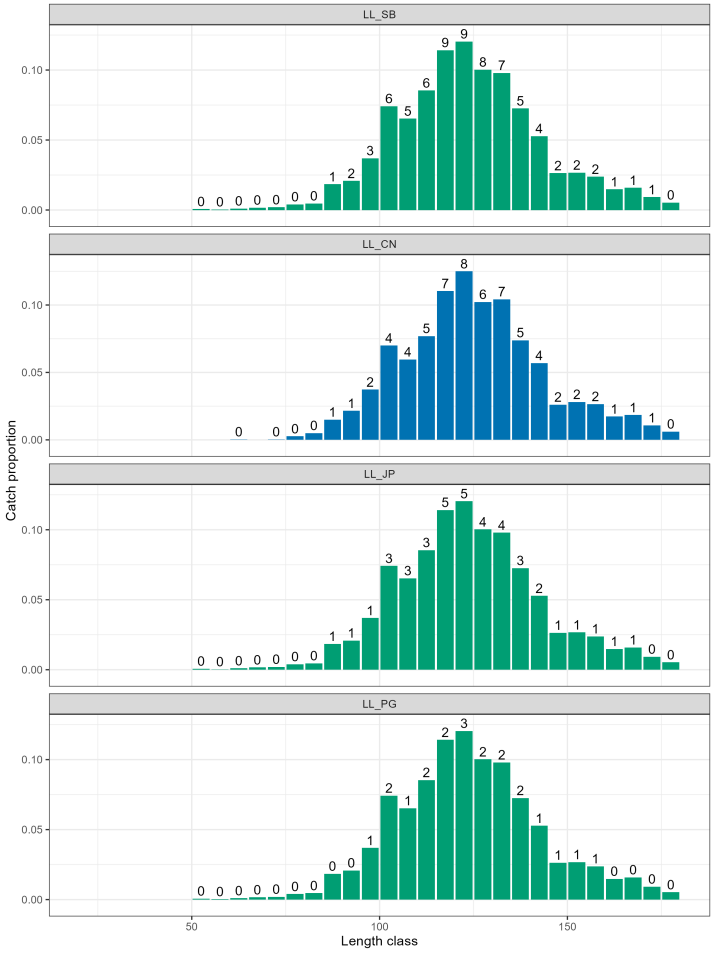


Figure B.11: The estimated length composition of bigeye tuna catches in region 8 per longline sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

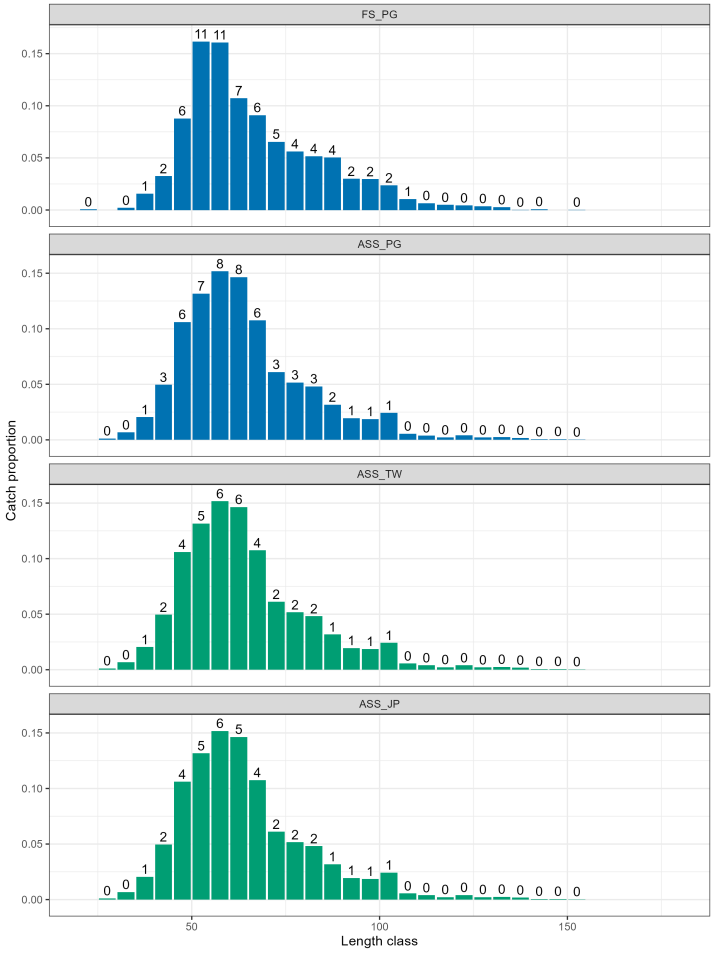


Figure B.12: The estimated length composition of bigeye tuna catches in region 8 per purse seine sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

Table B.13: Bigeye tuna: comparisons of target sample sizes for estimation of growth (Tar. growth, n) and maturity (Tar., mat., n) against available samples in the Pacific Marine Specimen Bank (PMSB growth and PMSB mat.), per region (Reg.).

Reg.	Tar. growth (n)	PMSB growth (n)	Tar. mat. (n)	PMSB mat. (n)
1	299	1	435	1
2	300	27	437	30
3	390	56	456	45
4	385	475	471	471
5	293	145	376	147
6	299	67	389	67
7	297	604	423	392
8	394	121	459	119

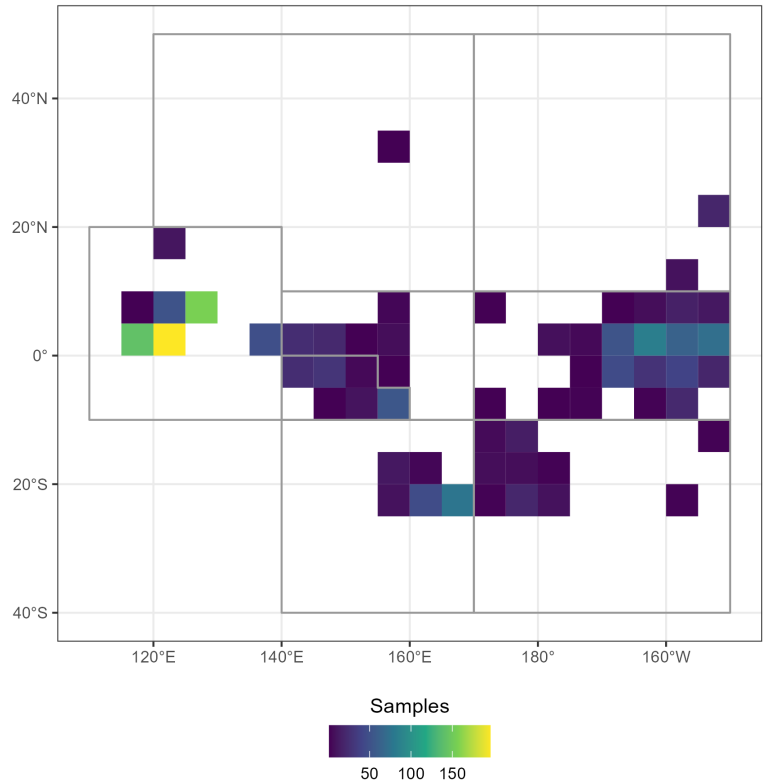


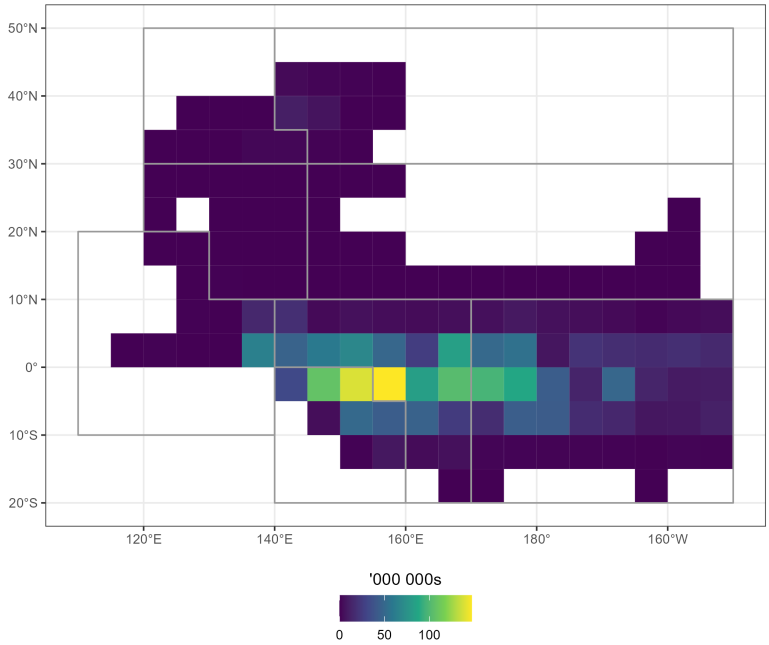
Figure B.13: Bigeye tuna: Spatial distributions of available otoliths in the Pacific Marine Specimen Bank for estimation of age and growth for the period 2020–2024.

Table B.14: Bigeye tuna: comparisons of target sample sizes for estimation of growth (Tar, n) against available samples in the Pacific Marine Specimen Bank (PMSB, n) by length class (Len., cm) for selected regions (4, 5, 7, 8).

Len. (cm)	4		5		7		8	
	Tar.	PMSB	Tar.	PMSB	Tar.	PMSB	Tar.	PMSB
15	0	0	0	0	0	12	0	0
20	0	0	0	0	0	209	0	0
25	0	1	0	0	1	172	0	0
30	3	22	0	0	2	32	0	0
35	10	35	0	0	4	13	4	15
40	23	30	0	0	4	28	9	27
45	39	38	0	0	4	24	20	17
50	32	58	1	0	5	11	28	12
55	28	55	2	0	4	4	31	24
60	17	51	5	0	4	2	26	10
65	15	43	8	0	3	1	20	6
70	11	19	16	0	4	0	12	5
75	9	10	14	0	5	1	11	4
80	5	6	14	0	4	2	11	0
85	4	17	21	1	5	1	11	0
90	6	33	21	0	6	2	9	0
95	5	16	20	3	12	2	12	0
100	7	12	21	2	22	2	20	0
105	9	17	21	20	18	6	14	1
110	11	5	24	15	19	7	16	0
115	12	1	22	17	27	19	23	0
120	17	1	19	11	33	6	25	0
125	16	1	17	19	30	8	20	0
130	21	1	12	16	26	8	20	0
135	21	1	9	11	20	9	15	0
140	22	0	9	12	17	2	11	0
145	16	2	5	10	12	0	6	0
150	11	0	3	3	4	1	6	0
155	6	0	3	1	2	0	6	0
160	3	0	3	2	0	1	3	0
165	2	0	3	0	0	0	3	0
170	2	0	0	1	0	1	2	0
175	1	0	0	1	0	0	0	0
180	1	0	0	0	0	1	0	0
185	0	0	0	0	0	1	0	0
190	0	0	0	0	0	0	0	0
195	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0
205	0	0	0	0	0	0	0	0
210	0	0	0	0	0	0	0	0

C Skipjack tuna

(a) Total reported catch



(b) Catch from sampled fleet-region combinations

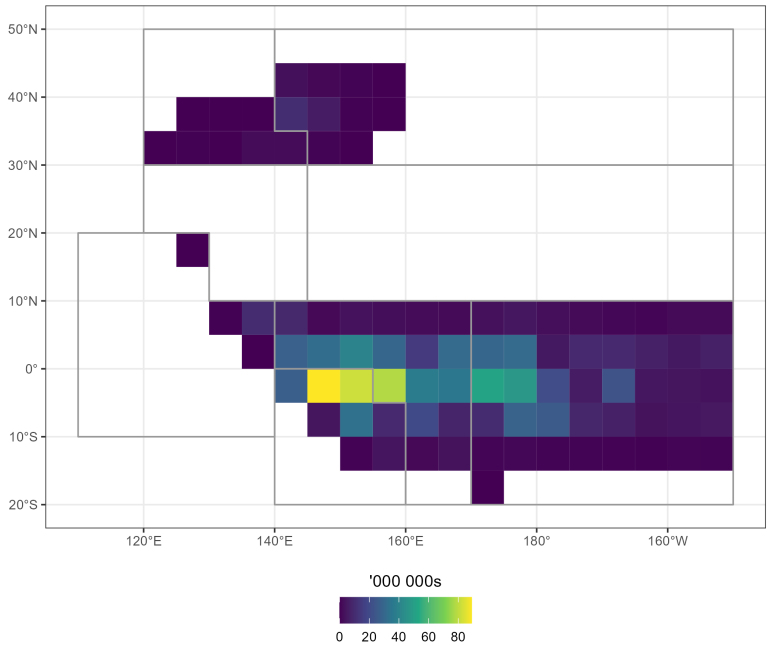


Figure C.1: Skipjack tuna: Spatial distributions of a) total reported catches and b) reported catch from sampled fleet-region combinations from 2020–2024, with sampling as per the developed biological sampling plan.

Table C.1: Skipjack tuna: average annual catch (thousands), available length samples for estimation of length frequencies (LF samples, individuals), target biological sampling rate (Bio. samples, individuals), and maximum supplemental samples for estimation of maturity per length class (Mat. samples, individuals), per region (Reg.) and fleet (FS prefix denotes purse seine fishing on free-schools, ASS prefix denotes purse seine fishing on associated schools, see Section 2).

Reg.	Fleet	Catch ('000s)	LF samples (n)	Bio. samples (n)	Mat. samples (n)
1	FS-JP	767	0	300	10
2	FS-JP	4251	0	300	10
5	FS-JP	953	0	144	5
5	ASS-JP	740	0	112	4
5	FS-FM	294	0	44	1
6	FS-PG	27230	0	164	5
6	FS-JP	8660	0	52	2
6	FS-KR	7410	0	45	1
6	ASS-PG	6434	0	39	1
7	FS-KR	16996	0	68	2
7	ASS-TW	16507	0	66	2
7	FS-JP	14530	0	58	2
7	ASS-FM	13954	0	56	2
7	FS-TW	13250	0	53	2
8	ASS-KI	35141	0	141	5
8	ASS-KR	14106	0	57	2
8	ASS-US	13715	0	55	2
8	ASS-MH	11677	0	47	2

Table C.2: Skipjack tuna - region 1: Target biological samples and supplemental samples for maturity estimation, per fleet (FS prefix denotes purse seine fishing on free-schools, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	FS-JP	
		Bio (n)	Mat (n)
1	16	0	10
1	18	0	10
1	20	0	10
1	22	0	10
1	24	0	10
1	26	0	10
1	28	0	10
1	30	0	10
1	32	0	10
1	34	1	9
1	36	2	8
1	38	2	8
1	40	3	7
1	42	25	0
1	44	44	0
1	46	54	0
1	48	43	0
1	50	26	0
1	52	19	0
1	54	19	0
1	56	18	0
1	58	12	0
1	60	8	0
1	62	4	0
1	64	3	0
1	66	2	0
1	68	2	0
1	70	2	0
1	72	1	0
1	74	2	0
1	76	3	0
1	78	3	0
1	80	2	0
1	82	1	0
1	84	0	0
1	86	0	0
1	88	0	0

Table C.3: Skipjack tuna - region 2: Target biological samples and supplemental samples for maturity estimation, per fleet (FS prefix denotes purse seine fishing on free-schools, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	FS-JP	
		Bio (n)	Mat (n)
2	16	0	10
2	18	0	10
2	20	0	10
2	22	0	10
2	24	0	10
2	26	0	10
2	28	0	10
2	30	0	10
2	32	0	10
2	34	1	9
2	36	1	9
2	38	2	8
2	40	5	5
2	42	12	0
2	44	20	0
2	46	28	0
2	48	41	0
2	50	52	0
2	52	51	0
2	54	39	0
2	56	26	0
2	58	11	0
2	60	6	0
2	62	3	0
2	64	1	0
2	66	1	0
2	68	1	0
2	70	1	0
2	72	0	0
2	74	0	0
2	76	0	0
2	78	0	0

Table C.4: Skipjack tuna - region 5: Target biological samples and supplemental samples for maturity estimation, per fleet (FS prefix denotes purse seine fishing on free-schools, ASS prefix denotes purse seine fishing on associated schools, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	FS-JP		ASS-JP		FS-FM	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
5	16	0	5	0	4	0	1
5	18	0	5	0	4	0	1
5	20	0	5	0	4	0	1
5	22	0	5	0	4	0	1
5	24	0	5	0	4	0	1
5	26	0	5	0	4	0	1
5	28	0	5	0	4	0	1
5	30	0	5	1	3	0	1
5	32	0	5	2	2	0	1
5	34	0	5	3	1	0	1
5	36	0	5	3	1	0	1
5	38	1	4	5	0	0	1
5	40	1	4	4	0	0	1
5	42	2	3	5	0	1	0
5	44	2	3	4	0	1	0
5	46	6	0	10	0	2	0
5	48	12	0	15	0	4	0
5	50	17	0	15	0	7	0
5	52	23	0	15	0	8	0
5	54	21	0	10	0	6	0
5	56	12	0	7	0	4	0
5	58	10	0	5	0	5	0
5	60	10	0	3	0	3	0
5	62	10	0	2	0	2	0
5	64	9	0	1	0	2	0
5	66	5	0	0	0	1	0
5	68	2	0	0	0	0	0
5	70	1	0	0	0	0	0
5	72	0	0	0	0	0	0
5	74	0	0	0	0	0	0
5	76	0	0	0	0	0	0
5	78	0	0	0	0	0	0
5	80	0	0	0	0	0	0
5	82	0	0	0	0	0	0
5	84	0	0	0	0	0	0
5	86	0	0	0	0	0	0

Table C.5: Skipjack tuna - region 6: Target biological samples and supplemental samples for maturity estimation, per fleet (FS prefix denotes purse seine fishing on free-schools, ASS prefix denotes purse seine fishing on associated schools, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	FS-PG		FS-JP		FS-KR		ASS-PG	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
6	16	0	5	0	2	0	1	0	1
6	18	0	5	0	2	0	1	0	1
6	20	0	5	0	2	0	1	0	1
6	22	0	5	0	2	0	1	0	1
6	24	0	5	0	2	0	1	0	1
6	26	0	5	0	2	0	1	0	1
6	28	0	5	0	2	0	1	0	1
6	30	0	5	0	2	0	1	0	1
6	32	1	4	0	2	0	1	0	1
6	34	1	4	0	2	0	1	1	0
6	36	2	3	0	2	0	1	1	0
6	38	3	2	1	1	0	1	2	0
6	40	5	0	1	1	1	0	3	0
6	42	7	0	2	0	1	0	3	0
6	44	10	0	3	0	2	0	4	0
6	46	16	0	5	0	2	0	5	0
6	48	21	0	7	0	4	0	6	0
6	50	19	0	6	0	5	0	4	0
6	52	17	0	6	0	5	0	3	0
6	54	15	0	6	0	6	0	2	0
6	56	13	0	5	0	5	0	2	0
6	58	11	0	4	0	4	0	1	0
6	60	8	0	3	0	3	0	1	0
6	62	6	0	2	0	2	0	0	0
6	64	4	0	1	0	2	0	0	0
6	66	3	0	0	0	1	0	0	0
6	68	2	0	0	0	1	0	0	0
6	70	1	0	0	0	0	0	0	0
6	72	1	0	0	0	0	0	0	0
6	74	0	0	0	0	0	0	0	0
6	76	0	0	0	0	0	0	0	0
6	78	0	0	0	0	0	0	0	0
6	80	0	0	0	0	0	0	0	0
6	82	0	0	0	0	0	0	0	0
6	84	0	0	0	0	0	0	0	0
6	86	0	0	0	0	0	0	0	0
6	88	0	0	0	0	0	0	0	0
6	90	0	0	0	0	0	0	0	0
6	92	0	0	0	0	0	0	0	0
6	94	0	0	0	0	0	0	0	0
6	96	0	0	0	0	0	0	0	0
6	98	0	0	0	0	0	0	0	0
6	100	0	0	0	0	0	0	0	0
6	102	0	0	0	0	0	0	0	0
6	104	0	0	0	0	0	0	0	0
6	106	0	0	0	0	0	0	0	0
6	108	0	0	0	0	0	0	0	0
6	110	0	0	0	0	0	0	0	0

Table C.6: Skipjack tuna - region 7: Target biological samples and supplemental samples for maturity estimation, per fleet (FS prefix denotes purse seine fishing on free-schools, ASS prefix denotes purse seine fishing on associated schools, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	FS-KR		ASS-TW		FS-JP		ASS-FM		FS-TW	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
7	16	0	2	0	2	0	2	0	2	0	2
7	18	0	2	0	2	0	2	0	2	0	2
7	20	0	2	0	2	0	2	0	2	0	2
7	22	0	2	0	2	0	2	0	2	0	2
7	24	0	2	0	2	0	2	0	2	0	2
7	26	0	2	0	2	0	2	0	2	0	2
7	28	0	2	0	2	0	2	0	2	0	2
7	30	0	2	0	2	0	2	0	2	0	2
7	32	0	2	1	1	0	2	1	1	0	2
7	34	0	2	1	1	0	2	1	1	0	2
7	36	0	2	1	1	0	2	1	1	0	2
7	38	0	2	2	0	1	1	2	0	0	2
7	40	1	1	4	0	1	1	3	0	1	1
7	42	1	1	4	0	1	1	4	0	1	1
7	44	2	0	5	0	2	0	4	0	1	1
7	46	2	0	6	0	3	0	5	0	2	0
7	48	3	0	7	0	5	0	6	0	3	0
7	50	5	0	7	0	6	0	5	0	4	0
7	52	6	0	6	0	8	0	5	0	5	0
7	54	9	0	6	0	8	0	5	0	7	0
7	56	9	0	5	0	7	0	4	0	7	0
7	58	9	0	4	0	5	0	3	0	7	0
7	60	7	0	3	0	4	0	2	0	5	0
7	62	6	0	2	0	3	0	1	0	4	0
7	64	4	0	1	0	2	0	1	0	3	0
7	66	2	0	1	0	1	0	0	0	1	0
7	68	1	0	0	0	0	0	0	0	1	0
7	70	0	0	0	0	0	0	0	0	0	0
7	72	0	0	0	0	0	0	0	0	0	0
7	74	0	0	0	0	0	0	0	0	0	0
7	76	0	0	0	0	0	0	0	0	0	0
7	78	0	0	0	0	0	0	0	0	0	0
7	80	0	0	0	0	0	0	0	0	0	0
7	82	0	0	0	0	0	0	0	0	0	0
7	84	0	0	0	0	0	0	0	0	0	0
7	86	0	0	0	0	0	0	0	0	0	0
7	88	0	0	0	0	0	0	0	0	0	0
7	90	0	0	0	0	0	0	0	0	0	0
7	92	0	0	0	0	0	0	0	0	0	0
7	94	0	0	0	0	0	0	0	0	0	0
7	96	0	0	0	0	0	0	0	0	0	0
7	98	0	0	0	0	0	0	0	0	0	0
7	100	0	0	0	0	0	0	0	0	0	0
7	102	0	0	0	0	0	0	0	0	0	0
7	104	0	0	0	0	0	0	0	0	0	0
7	106	0	0	0	0	0	0	0	0	0	0
7	108	0	0	0	0	0	0	0	0	0	0

Table C.7: Skipjack tuna - region 8: Target biological samples and supplemental samples for maturity estimation, per fleet (ASS prefix denotes purse seine fishing on associated schools, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	ASS-KI		ASS-KR		ASS-US		ASS-MH	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
8	16	0	5	0	2	0	2	0	2
8	18	0	5	0	2	0	2	0	2
8	20	0	5	0	2	0	2	0	2
8	22	0	5	0	2	0	2	0	2
8	24	0	5	0	2	0	2	0	2
8	26	0	5	0	2	0	2	0	2
8	28	0	5	0	2	0	2	0	2
8	30	1	4	0	2	0	2	0	2
8	32	1	4	1	1	0	2	1	1
8	34	2	3	1	1	1	1	1	1
8	36	3	2	2	0	1	1	2	0
8	38	5	0	2	0	2	0	3	0
8	40	8	0	3	0	4	0	4	0
8	42	10	0	3	0	4	0	4	0
8	44	13	0	4	0	5	0	4	0
8	46	15	0	5	0	6	0	5	0
8	48	16	0	6	0	6	0	5	0
8	50	13	0	6	0	5	0	4	0
8	52	12	0	5	0	4	0	3	0
8	54	10	0	5	0	4	0	3	0
8	56	9	0	4	0	4	0	2	0
8	58	7	0	3	0	3	0	2	0
8	60	5	0	2	0	2	0	2	0
8	62	4	0	2	0	2	0	1	0
8	64	3	0	1	0	1	0	1	0
8	66	2	0	1	0	1	0	0	0
8	68	1	0	0	0	0	0	0	0
8	70	1	0	0	0	0	0	0	0
8	72	0	0	0	0	0	0	0	0
8	74	0	0	0	0	0	0	0	0
8	76	0	0	0	0	0	0	0	0
8	78	0	0	0	0	0	0	0	0
8	80	0	0	0	0	0	0	0	0
8	82	0	0	0	0	0	0	0	0
8	84	0	0	0	0	0	0	0	0
8	86	0	0	0	0	0	0	0	0
8	88	0	0	0	0	0	0	0	0
8	90	0	0	0	0	0	0	0	0
8	92	0	0	0	0	0	0	0	0
8	94	0	0	0	0	0	0	0	0
8	96	0	0	0	0	0	0	0	0
8	98	0	0	0	0	0	0	0	0
8	100	0	0	0	0	0	0	0	0
8	102	0	0	0	0	0	0	0	0
8	104	0	0	0	0	0	0	0	0
8	106	0	0	0	0	0	0	0	0
8	108	0	0	0	0	0	0	0	0

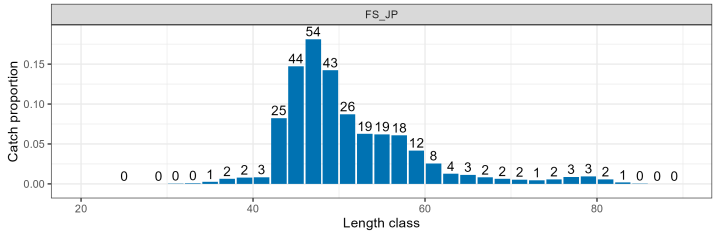


Figure C.2: The estimated length composition of skipjack tuna catches in region 1 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

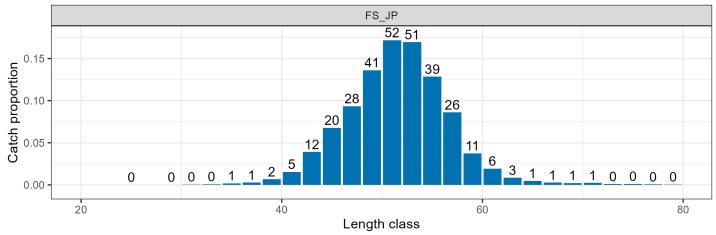


Figure C.3: The estimated length composition of skipjack tuna catches in region 2 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

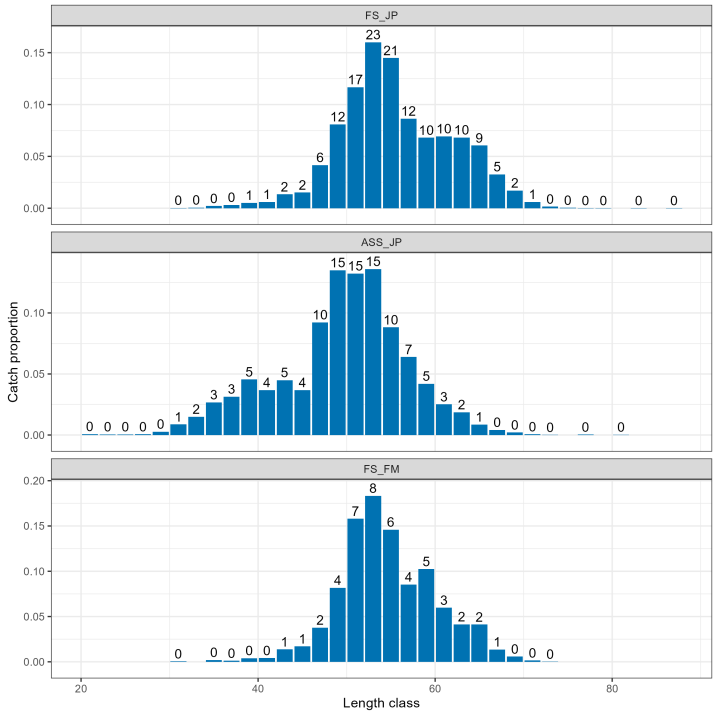


Figure C.4: The estimated length composition of skipjack tuna catches in region 5 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

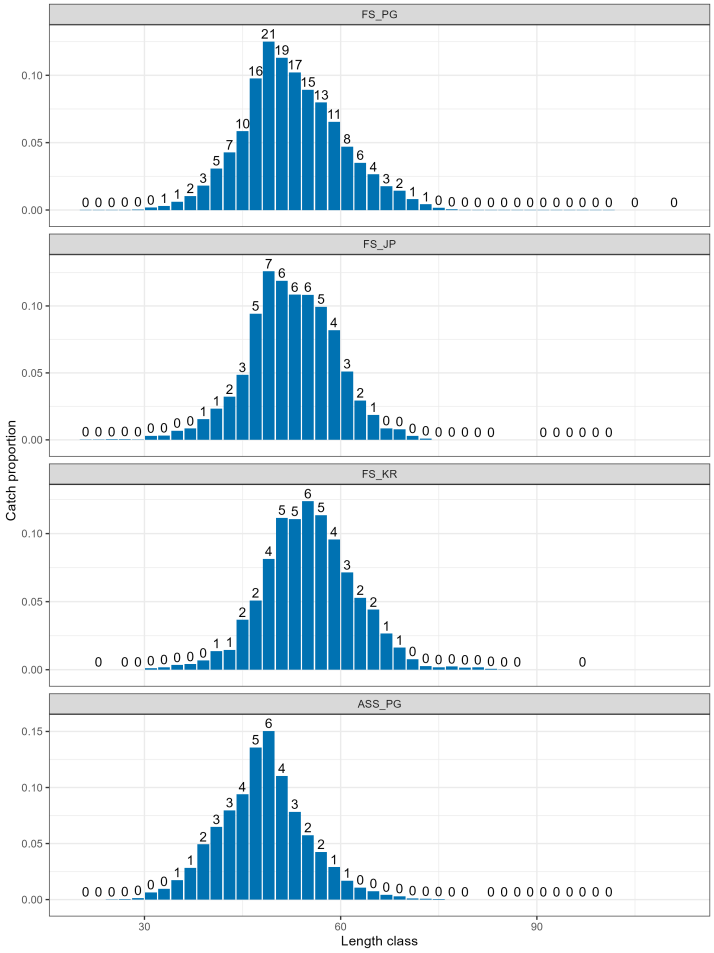


Figure C.5: The estimated length composition of skipjack tuna catches in region 6 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

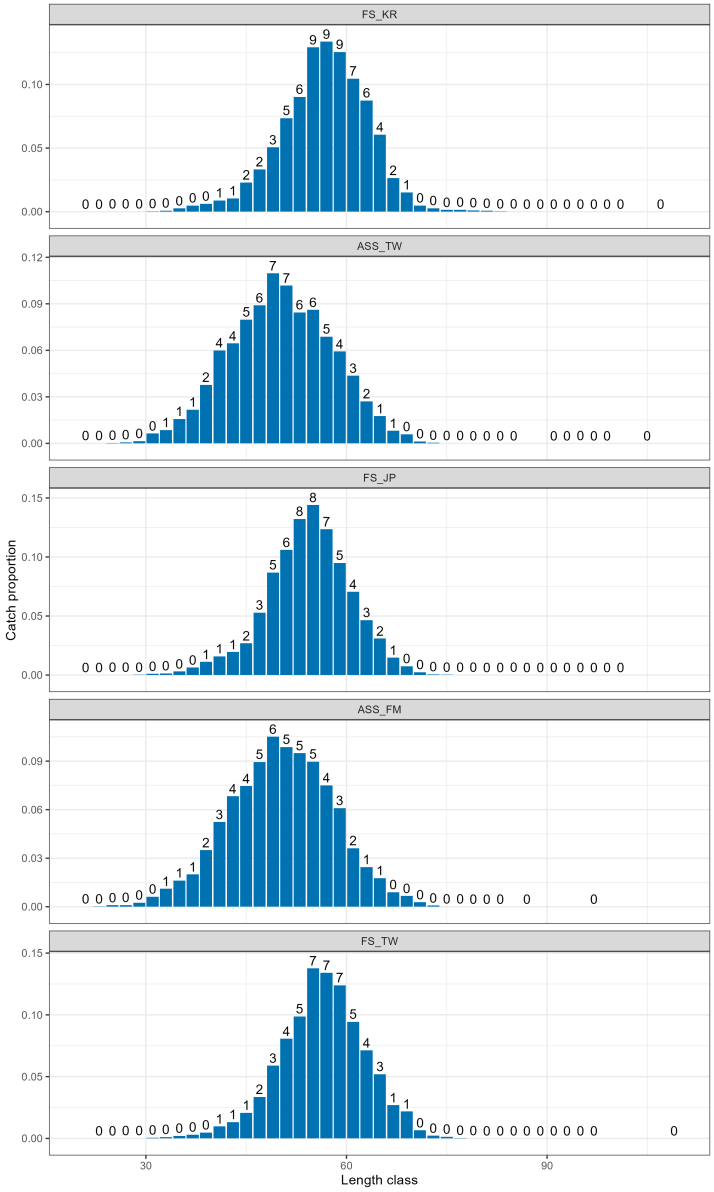


Figure C.6: The estimated length composition of skipjack tuna catches in region 7 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

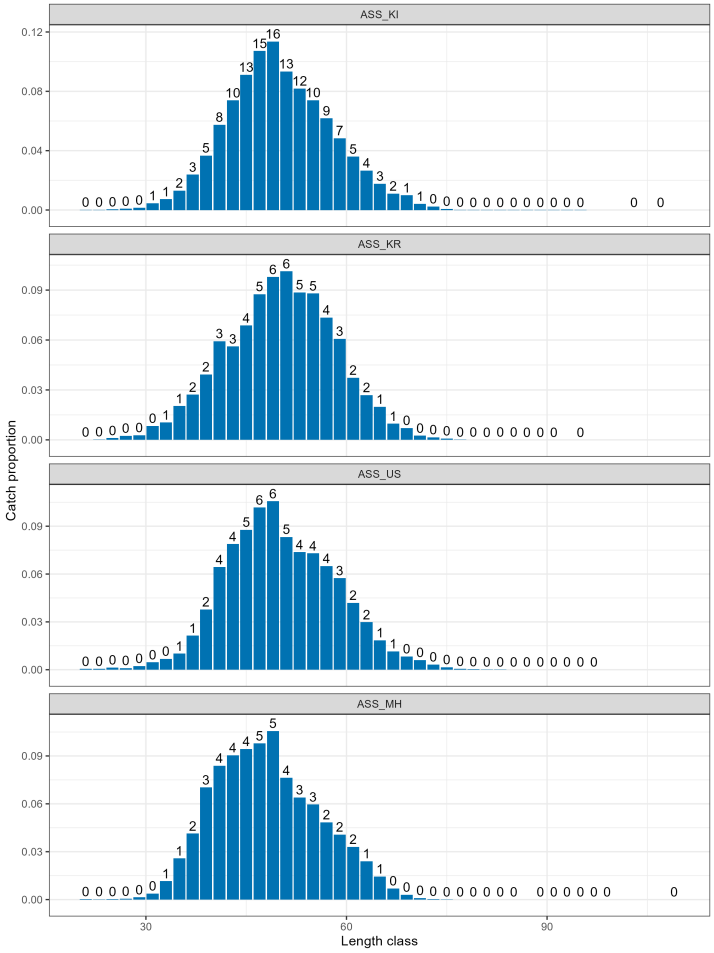


Figure C.7: The estimated length composition of skipjack tuna catches in region 8 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

Table C.8: Skipjack tuna: comparisons of target sample sizes for estimation of growth (Tar. growth, n) and maturity (Tar., mat., n) against available samples in the Pacific Marine Specimen Bank (PMSB growth and PMSB mat.), per region (Reg.).

Reg.	Tar. growth (n)	PMSB growth (n)	Tar. mat. (n)	PMSB mat. (n)
1	301	0	423	0
2	302	0	423	0
5	300	1027	417	722
6	300	7798	398	7775
7	295	1091	411	1029
8	299	419	403	455

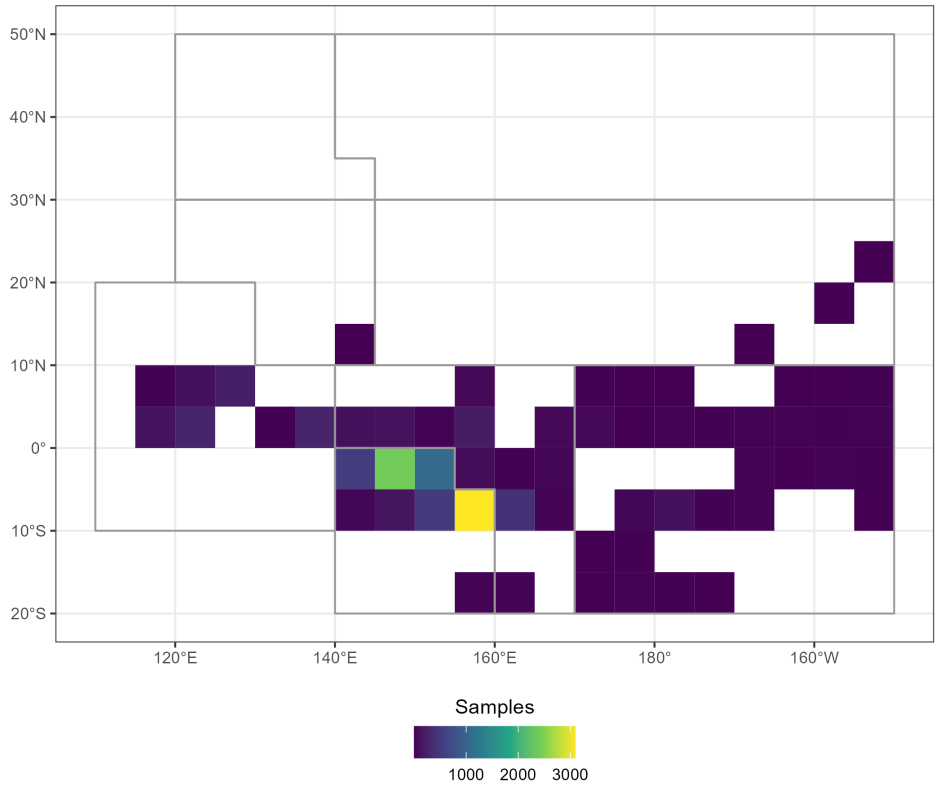


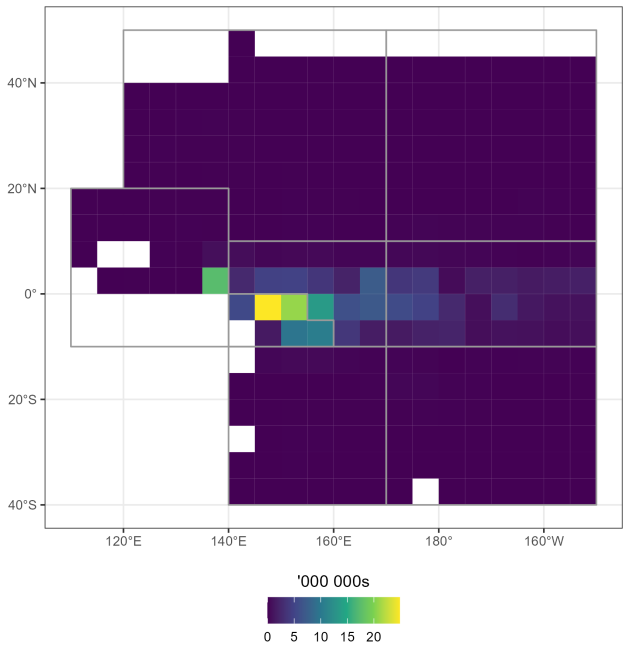
Figure C.8: Skipjack tuna: Spatial distributions of available otoliths in the Pacific Marine Specimen Bank for estimation of age and growth for the period 2020–2024.

Table C.9: Skipjack tuna: comparisons of target sample sizes for estimation of growth (Tar, n) against available samples in the Pacific Marine Specimen Bank (PMSB, n) by length class (Len., cm) for selected regions (5, 6, 7, 8).

Len. (cm)	5		6		7		8	
	Tar.	PMSB	Tar.	PMSB	Tar.	PMSB	Tar.	PMSB
16	0	84	0	0	0	0	0	0
18	0	326	0	0	0	0	0	0
20	0	34	0	0	0	0	0	0
22	0	8	0	0	0	0	0	0
24	0	11	0	0	0	0	0	0
26	0	2	0	0	0	0	0	0
28	0	2	0	1	0	0	0	0
30	1	5	0	4	0	1	1	0
32	2	7	1	9	2	2	3	0
34	3	8	2	23	2	3	5	4
36	3	24	3	31	2	4	8	5
38	6	32	6	41	5	4	12	6
40	5	38	10	88	10	14	19	7
42	8	64	13	205	11	28	21	8
44	7	69	19	540	14	74	26	17
46	18	67	28	1064	18	149	31	19
48	31	80	38	1395	24	196	33	28
50	39	54	34	1184	27	199	28	34
52	46	54	31	939	30	131	24	35
54	37	31	29	697	35	95	22	45
56	23	7	25	499	32	37	19	32
58	20	6	20	443	28	43	15	34
60	16	4	15	282	21	29	11	24
62	14	2	10	151	16	18	9	13
64	12	3	7	93	11	25	6	16
66	6	2	4	34	5	17	4	14
68	2	1	3	21	2	7	1	19
70	1	0	1	24	0	1	1	23
72	0	0	1	11	0	2	0	13
74	0	0	0	10	0	2	0	8
76	0	0	0	4	0	6	0	9
78	0	0	0	3	0	3	0	3
80	0	0	0	1	0	1	0	1
82	0	0	0	0	0	0	0	0
84	0	0	0	0	0	0	0	0
86	0	0	0	0	0	0	0	0
88	0	0	0	1	0	0	0	0
90	0	0	0	0	0	0	0	2
92	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
102	0	0	0	0	0	0	0	0
104	0	0	0	0	0	0	0	0
106	0	0	0	0	0	0	0	0
108	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0

D Yellowfin tuna

(a) Total reported catch



(b) Catch from sampled fleet-region combinations

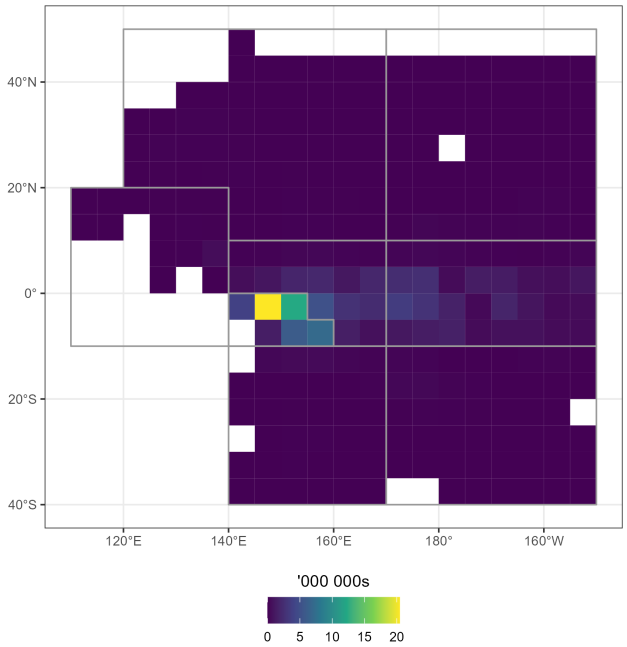


Figure D.1: Yellowfin tuna: Spatial distributions of a) total reported catches and b) reported catch from sampled fleet-region combinations from 2020–2024, with sampling as per the developed biological sampling plan.

Table D.1: Yellowfin tuna: average annual catch (thousands), available length samples for estimation of length frequencies (LF samples, individuals), target biological sampling rate (Bio. samples, individuals), and maximum supplemental samples for estimation of maturity per length class (Mat. samples, individuals), per region (Reg.) and fleet (LL prefix denotes longline, FS prefix denotes purse seine fishing on free-schools, ASS prefix denotes purse seine fishing on associated schools, see Section 2).

Reg.	Fleet	Catch ('000s)	LF samples (n)	Bio. samples (n)	Mat. samples (n)
1	LL-JP	124	1625	211	7
1	LL-TWOS	52	11582	89	3
2	LL-KR	101	17161	152	5
2	LL-USHW	70	27159	105	4
2	LL-TWOS	29	7152	43	1
3	ASS-TW	1650	21976	87	4
3	ASS-FM	1218	21013	64	3
3	FS-KR	926	23292	49	2
3	LL-TWOS	114	34925	49	0
3	LL-SB	89	799	38	0
3	LL-KR	86	25235	37	0
3	LL-CN	69	13499	30	0
3	LL-FM	61	26683	26	0
3	LL-JP	47	2777	20	0
4	ASS-KI	2075	34295	80	4
4	ASS-US	997	18303	38	2
4	ASS-MH	765	14619	30	1
4	ASS-KR	689	13301	27	1
4	ASS-ES	657	2097	25	1
4	LL-KR	393	64954	114	0
4	LL-CN	122	19687	35	0
4	LL-TWOS	96	26567	28	0
4	LL-KI	76	27373	22	0
5	LL-CN	176	24555	156	5
5	LL-AU	57	0	50	2
5	LL-SB	56	211	49	2
5	LL-JP	51	5372	45	2
6	LL-CN	147	23049	144	5
6	LL-FJ	127	127258	125	4
6	LL-TWOS	31	40694	31	1
7	ASS-JP	65	454	130	4
7	LL-TWOS	29	2436	58	2
7	LL-JP	21	1981	42	1
7	FS-JP	19	1886	38	1
7	ASS-FM	16	160	33	1
8	FS-PG	6806	218726	136	7
8	ASS-PG	1909	55089	38	2
8	ASS-SB	1303	57044	26	1
8	LL-SB	76	1338	82	0
8	LL-CN	59	12672	63	0
8	LL-JP	29	2035	32	0
8	LL-PG	22	105	23	0

Table D.2: Yellowfin tuna - region 1: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-JP		LL-TWOS	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)
1	15	0	7	0	3
1	20	0	7	0	3
1	25	0	7	0	3
1	30	0	7	0	3
1	35	0	7	0	3
1	40	0	7	0	3
1	45	0	7	0	3
1	50	0	7	0	3
1	55	0	7	0	3
1	60	1	6	0	3
1	65	2	5	0	3
1	70	4	3	1	2
1	75	5	2	1	2
1	80	4	3	1	2
1	85	5	2	2	1
1	90	6	1	8	0
1	95	7	0	11	0
1	100	13	0	12	0
1	105	21	0	11	0
1	110	20	0	10	0
1	115	36	0	10	0
1	120	40	0	9	0
1	125	19	0	8	0
1	130	12	0	3	0
1	135	8	0	1	0
1	140	4	0	0	0
1	145	3	0	0	0
1	150	2	0	0	0
1	155	0	0	0	0
1	160	0	0	0	0

Table D.3: Yellowfin tuna - region 2: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-KR		LL-USHW		LL-TWOS	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
2	15	0	5	0	4	0	1
2	20	0	5	0	4	0	1
2	25	0	5	0	4	0	1
2	30	0	5	0	4	0	1
2	35	0	5	0	4	0	1
2	40	0	5	0	4	0	1
2	45	0	5	0	4	0	1
2	50	0	5	0	4	0	1
2	55	0	5	1	3	0	1
2	60	0	5	2	2	0	1
2	65	0	5	2	2	0	1
2	70	1	4	3	1	0	1
2	75	2	3	3	1	0	1
2	80	3	2	3	1	1	0
2	85	4	1	3	1	1	0
2	90	4	1	3	1	1	0
2	95	5	0	4	0	2	0
2	100	6	0	5	0	3	0
2	105	9	0	7	0	3	0
2	110	11	0	8	0	5	0
2	115	12	0	11	0	7	0
2	120	17	0	13	0	8	0
2	125	23	0	13	0	6	0
2	130	23	0	9	0	3	0
2	135	15	0	7	0	1	0
2	140	8	0	4	0	0	0
2	145	5	0	2	0	0	0
2	150	2	0	1	0	0	0
2	155	1	0	0	0	0	0
2	160	0	0	0	0	0	0
2	165	0	0	0	0	0	0
2	170	0	0	0	0	0	0
2	175	0	0	0	0	0	0
2	180	0	0	0	0	0	0
2	185	0	0	0	0	0	0
2	190	0	0	0	0	0	0
2	195	0	0	0	0	0	0
2	200	0	0	0	0	0	0
2	205	0	0	0	0	0	0

Table D.4: Yellowfin tuna - region 3: target biological samples and supplemental samples for maturity estimation, per purse seine fleet (FS prefix denotes free-schools, ASS prefix denotes associated schools, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	ASS-TW		ASS-FM		FS-KR	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
3	15	0	4	0	3	0	2
3	20	0	4	0	3	0	2
3	25	0	4	0	3	0	2
3	30	1	3	1	2	0	2
3	35	3	1	2	1	0	2
3	40	6	0	4	0	0	2
3	45	14	0	9	0	1	1
3	50	13	0	8	0	2	0
3	55	11	0	9	0	3	0
3	60	7	0	7	0	4	0
3	65	7	0	5	0	4	0
3	70	4	0	3	0	3	0
3	75	4	0	3	0	3	0
3	80	3	1	2	1	2	0
3	85	3	1	2	1	3	0
3	90	2	2	2	1	3	0
3	95	3	1	2	1	3	0
3	100	3	0	2	0	3	0
3	105	1	0	1	0	3	0
3	110	1	0	1	0	3	0
3	115	0	0	0	0	2	0
3	120	0	0	0	0	2	0
3	125	0	0	0	0	2	0
3	130	0	0	0	0	1	0
3	135	0	0	0	0	1	0
3	140	0	0	0	0	0	0
3	145	0	0	0	0	0	0
3	150	0	0	0	0	0	0
3	155	0	0	0	0	0	0
3	160	0	0	0	0	0	0
3	165	0	0	0	0	0	0
3	170	0	0	0	0	0	0
3	175	0	0	0	0	0	0
3	180	0	0	0	0	0	0
3	185	0	0	0	0	0	0

Table D.5: Yellowfin tuna - region 3: target biological samples and supplemental samples for maturity estimation, per longline fleet and length class (Len., cm).

Reg.	Len. (cm)	LL-TWOS		LL-SB		LL-KR		LL-CN		LL-FM		LL-JP	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
3	15	0	0	0	0	0	0	0	0	0	0	0	0
3	20	0	0	0	0	0	0	0	0	0	0	0	0
3	25	0	0	0	0	0	0	0	0	0	0	0	0
3	30	0	0	0	0	0	0	0	0	0	0	0	0
3	35	0	0	0	0	0	0	0	0	0	0	0	0
3	40	0	0	0	0	0	0	0	0	0	0	0	0
3	45	0	0	0	0	0	0	0	0	0	0	0	0
3	50	0	0	0	0	0	0	0	0	0	0	0	0
3	55	0	0	0	0	0	0	0	0	0	0	0	0
3	60	0	0	0	0	0	0	0	0	0	0	0	0
3	65	0	0	0	0	0	0	0	0	0	0	0	0
3	70	0	0	0	0	0	0	0	0	0	0	1	0
3	75	1	0	0	0	0	0	0	0	0	0	1	0
3	80	1	0	1	0	1	0	0	0	0	0	0	0
3	85	2	0	1	0	1	0	1	0	0	0	0	0
3	90	3	0	2	0	2	0	1	0	0	0	1	0
3	95	3	0	2	0	2	0	2	0	1	0	1	0
3	100	4	0	4	0	4	0	5	0	3	0	2	0
3	105	5	0	5	0	5	0	5	0	4	0	3	0
3	110	7	0	5	0	4	0	3	0	5	0	3	0
3	115	7	0	5	0	3	0	4	0	4	0	3	0
3	120	6	0	5	0	4	0	3	0	4	0	2	0
3	125	4	0	3	0	3	0	2	0	2	0	1	0
3	130	2	0	2	0	3	0	1	0	1	0	0	0
3	135	1	0	1	0	2	0	1	0	1	0	0	0
3	140	1	0	1	0	1	0	0	0	0	0	0	0
3	145	0	0	0	0	1	0	0	0	0	0	0	0
3	150	0	0	0	0	0	0	0	0	0	0	0	0
3	155	0	0	0	0	0	0	0	0	0	0	0	0
3	160	0	0	0	0	0	0	0	0	0	0	0	0
3	165	0	0	0	0	0	0	0	0	0	0	0	0
3	170	0	0	0	0	0	0	0	0	0	0	0	0
3	175	0	0	0	0	0	0	0	0	0	0	0	0
3	180	0	0	0	0	0	0	0	0	0	0	0	0
3	185	0	0	0	0	0	0	0	0	0	0	0	0
3	190	0	0	0	0	0	0	0	0	0	0	0	0
3	195	0	0	0	0	0	0	0	0	0	0	0	0
3	200	0	0	0	0	0	0	0	0	0	0	0	0
3	205	0	0	0	0	0	0	0	0	0	0	0	0
3	210	0	0	0	0	0	0	0	0	0	0	0	0

Table D.6: Yellowfin tuna - region 4: target biological samples and supplemental samples for maturity estimation, per purse seine fleet (ASS prefix denotes associated schools, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	ASS-KI		ASS-US		ASS-MH		ASS-KR		ASS-ES	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
4	15	0	4	0	2	0	1	0	1	0	1
4	20	0	4	0	2	0	1	0	1	0	1
4	25	0	4	0	2	0	1	0	1	0	1
4	30	1	3	1	1	1	0	1	0	0	1
4	35	4	0	2	0	2	0	2	0	2	0
4	40	7	0	4	0	3	0	2	0	4	0
4	45	14	0	8	0	6	0	5	0	8	0
4	50	13	0	6	0	4	0	5	0	3	0
4	55	11	0	4	0	4	0	4	0	3	0
4	60	7	0	3	0	2	0	2	0	1	0
4	65	5	0	2	0	2	0	2	0	1	0
4	70	3	1	2	0	1	0	1	0	0	1
4	75	3	1	1	1	1	0	1	0	0	1
4	80	2	2	1	1	1	0	1	0	0	1
4	85	2	2	1	1	1	0	1	0	0	1
4	90	2	2	1	1	0	1	0	1	0	1
4	95	2	2	1	1	1	0	0	1	0	1
4	100	2	0	1	0	0	0	1	0	0	0
4	105	1	0	1	0	0	0	0	0	0	0
4	110	1	0	0	0	0	0	0	0	0	0
4	115	1	0	0	0	0	0	0	0	0	0
4	120	1	0	0	0	0	0	0	0	0	0
4	125	0	0	0	0	0	0	0	0	0	0
4	130	0	0	0	0	0	0	0	0	0	0
4	135	0	0	0	0	0	0	0	0	0	0
4	140	0	0	0	0	0	0	0	0	0	0
4	145	0	0	0	0	0	0	0	0	0	0
4	150	0	0	0	0	0	0	0	0	0	0
4	155	0	0	0	0	0	0	0	0	0	0
4	160	0	0	0	0	0	0	0	0	0	0
4	165	0	0	0	0	0	0	0	0	0	0
4	170	0	0	0	0	0	0	0	0	0	0
4	175	0	0	0	0	0	0	0	0	0	0
4	180	0	0	0	0	0	0	0	0	0	0

Table D.7: Yellowfin tuna - region 4: target biological samples and supplemental samples for maturity estimation, per longline fleet and length class (Len., cm).

Reg.	Len. (cm)	LL-KR		LL-CN		LL-TWOS		LL-KI	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
4	15	0	0	0	0	0	0	0	0
4	20	0	0	0	0	0	0	0	0
4	25	0	0	0	0	0	0	0	0
4	30	0	0	0	0	0	0	0	0
4	35	0	0	0	0	0	0	0	0
4	40	0	0	0	0	0	0	0	0
4	45	0	0	0	0	0	0	0	0
4	50	0	0	0	0	0	0	0	0
4	55	0	0	0	0	0	0	0	0
4	60	0	0	0	0	0	0	0	0
4	65	0	0	1	0	0	0	0	0
4	70	0	0	1	0	0	0	0	0
4	75	0	0	1	0	0	0	0	0
4	80	2	0	1	0	0	0	0	0
4	85	3	0	1	0	0	0	0	0
4	90	5	0	3	0	1	0	1	0
4	95	4	0	3	0	1	0	1	0
4	100	5	0	4	0	1	0	1	0
4	105	6	0	3	0	2	0	1	0
4	110	7	0	3	0	2	0	1	0
4	115	9	0	4	0	3	0	2	0
4	120	13	0	3	0	4	0	3	0
4	125	16	0	2	0	5	0	3	0
4	130	17	0	2	0	4	0	3	0
4	135	12	0	2	0	2	0	2	0
4	140	8	0	1	0	1	0	1	0
4	145	4	0	1	0	0	0	1	0
4	150	2	0	0	0	0	0	0	0
4	155	1	0	0	0	0	0	0	0
4	160	0	0	0	0	0	0	0	0
4	165	0	0	0	0	0	0	0	0
4	170	0	0	0	0	0	0	0	0
4	175	0	0	0	0	0	0	0	0
4	180	0	0	0	0	0	0	0	0
4	185	0	0	0	0	0	0	0	0
4	190	0	0	0	0	0	0	0	0
4	195	0	0	0	0	0	0	0	0
4	200	0	0	0	0	0	0	0	0
4	205	0	0	0	0	0	0	0	0

Table D.8: Yellowfin tuna - region 5: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-CN		LL-AU		LL-SB		LL-JP	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
5	15	0	5	0	2	0	2	0	2
5	20	0	5	0	2	0	2	0	2
5	25	0	5	0	2	0	2	0	2
5	30	0	5	0	2	0	2	0	2
5	35	0	5	0	2	0	2	0	2
5	40	0	5	0	2	0	2	0	2
5	45	0	5	0	2	0	2	0	2
5	50	0	5	0	2	0	2	0	2
5	55	0	5	0	2	0	2	0	2
5	60	1	4	0	2	0	2	0	2
5	65	3	2	1	1	1	1	1	1
5	70	4	1	1	1	1	1	1	1
5	75	4	1	1	1	1	1	1	1
5	80	6	0	2	0	2	0	1	1
5	85	10	0	3	0	3	0	3	0
5	90	13	0	4	0	4	0	3	0
5	95	12	0	3	0	3	0	3	0
5	100	14	0	4	0	4	0	4	0
5	105	16	0	5	0	5	0	5	0
5	110	17	0	5	0	5	0	5	0
5	115	14	0	6	0	5	0	5	0
5	120	12	0	5	0	5	0	4	0
5	125	9	0	3	0	3	0	3	0
5	130	7	0	3	0	2	0	2	0
5	135	5	0	2	0	2	0	2	0
5	140	3	0	1	0	1	0	1	0
5	145	2	0	1	0	1	0	1	0
5	150	1	0	0	0	0	0	0	0
5	155	0	0	0	0	0	0	0	0
5	160	0	0	0	0	0	0	0	0
5	165	0	0	0	0	0	0	0	0
5	170	0	0	0	0	0	0	0	0
5	175	0	0	0	0	0	0	0	0
5	180	0	0	0	0	0	0	0	0

Table D.9: Yellowfin tuna - region 6: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-CN		LL-FJ		LL-TWOS	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
6	15	0	5	0	4	0	1
6	20	0	5	0	4	0	1
6	25	0	5	0	4	0	1
6	30	1	4	0	4	0	1
6	35	0	5	0	4	0	1
6	40	1	4	0	4	0	1
6	45	1	4	0	4	0	1
6	50	1	4	0	4	0	1
6	55	1	4	0	4	0	1
6	60	3	2	1	3	0	1
6	65	6	0	1	3	1	0
6	70	4	1	2	2	1	0
6	75	5	0	3	1	1	0
6	80	7	0	4	0	1	0
6	85	10	0	8	0	2	0
6	90	11	0	14	0	2	0
6	95	10	0	17	0	2	0
6	100	9	0	14	0	2	0
6	105	10	0	13	0	2	0
6	110	9	0	11	0	3	0
6	115	12	0	11	0	3	0
6	120	13	0	8	0	3	0
6	125	11	0	6	0	2	0
6	130	7	0	4	0	2	0
6	135	5	0	4	0	2	0
6	140	3	0	2	0	1	0
6	145	2	0	2	0	1	0
6	150	1	0	1	0	1	0
6	155	0	0	0	0	0	0
6	160	0	0	0	0	0	0
6	165	0	0	0	0	0	0
6	170	0	0	0	0	0	0
6	175	0	0	0	0	0	0
6	180	0	0	0	0	0	0
6	185	0	0	0	0	0	0
6	190	0	0	0	0	0	0
6	195	0	0	0	0	0	0

Table D.10: Yellowfin tuna - region 7: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, FS prefix denotes purse seine fishing on free-schools, ASS prefix denotes purse seine fishing on associated schools, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	ASS-JP		LL-TWOS		LL-JP		FS-JP		ASS-FM	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
7	15	0	4	0	2	0	1	0	1	0	1
7	20	2	2	0	2	0	1	0	1	1	0
7	25	7	0	0	2	0	1	0	1	2	0
7	30	13	0	0	2	0	1	0	1	3	0
7	35	21	0	0	2	0	1	0	1	5	0
7	40	28	0	0	2	0	1	0	1	7	0
7	45	27	0	0	2	0	1	1	0	7	0
7	50	16	0	0	2	0	1	1	0	4	0
7	55	7	0	0	2	0	1	2	0	2	0
7	60	4	0	0	2	0	1	4	0	1	0
7	65	2	2	0	2	0	1	3	0	1	0
7	70	1	3	1	1	1	0	2	0	0	1
7	75	1	3	1	1	1	0	1	0	0	1
7	80	0	4	1	1	2	0	1	0	0	1
7	85	0	4	1	1	2	0	1	0	0	1
7	90	0	4	2	0	3	0	2	0	0	1
7	95	0	4	3	0	3	0	2	0	0	1
7	100	0	0	3	0	2	0	2	0	0	0
7	105	0	0	5	0	2	0	4	0	0	0
7	110	0	0	7	0	4	0	4	0	0	0
7	115	0	0	10	0	6	0	2	0	0	0
7	120	0	0	10	0	6	0	3	0	0	0
7	125	0	0	7	0	6	0	2	0	0	0
7	130	0	0	4	0	4	0	1	0	0	0
7	135	0	0	1	0	1	0	0	0	0	0
7	140	0	0	0	0	0	0	0	0	0	0
7	145	0	0	0	0	0	0	0	0	0	0
7	150	0	0	0	0	0	0	0	0	0	0
7	155	0	0	0	0	0	0	0	0	0	0
7	160	0	0	0	0	0	0	0	0	0	0

Table D.11: Yellowfin tuna - region 8: target biological samples and supplemental samples for maturity estimation, per purse seine fleet (FS prefix denotes free-schools, ASS prefix denotes associated schools, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	FS-PG		ASS-PG		ASS-SB	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
8	15	0	7	0	2	0	1
8	20	0	7	0	2	0	1
8	25	0	7	0	2	0	1
8	30	0	7	0	2	0	1
8	35	1	6	1	1	1	0
8	40	3	4	2	0	2	0
8	45	9	0	6	0	5	0
8	50	16	0	8	0	5	0
8	55	18	0	7	0	4	0
8	60	14	0	4	0	3	0
8	65	12	0	3	0	2	0
8	70	7	0	1	1	1	0
8	75	7	0	1	1	1	0
8	80	6	1	1	1	1	0
8	85	6	1	1	1	0	1
8	90	6	1	1	1	0	1
8	95	8	0	1	1	0	1
8	100	6	0	0	0	0	0
8	105	5	0	0	0	0	0
8	110	5	0	0	0	0	0
8	115	3	0	0	0	0	0
8	120	3	0	0	0	0	0
8	125	2	0	0	0	0	0
8	130	1	0	0	0	0	0
8	135	1	0	0	0	0	0
8	140	0	0	0	0	0	0
8	145	0	0	0	0	0	0
8	150	0	0	0	0	0	0
8	155	0	0	0	0	0	0
8	160	0	0	0	0	0	0
8	165	0	0	0	0	0	0
8	170	0	0	0	0	0	0
8	175	0	0	0	0	0	0
8	180	0	0	0	0	0	0
8	185	0	0	0	0	0	0

Table D.12: Yellowfin tuna - region 8: target biological samples and supplemental samples for maturity estimation, per longline fleet and length class (Len., cm).

Reg.	Len. (cm)	LL-SB		LL-CN		LL-JP		LL-PG	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
8	15	0	0	0	0	0	0	0	0
8	20	0	0	0	0	0	0	0	0
8	25	0	0	0	0	0	0	0	0
8	30	0	0	0	0	0	0	0	0
8	35	0	0	0	0	0	0	0	0
8	40	0	0	0	0	0	0	0	0
8	45	0	0	0	0	0	0	0	0
8	50	0	0	0	0	0	0	0	0
8	55	0	0	0	0	0	0	0	0
8	60	0	0	0	0	0	0	0	0
8	65	0	0	0	0	0	0	0	0
8	70	0	0	0	0	1	0	0	0
8	75	1	0	1	0	2	0	0	0
8	80	2	0	1	0	1	0	1	0
8	85	2	0	1	0	2	0	0	0
8	90	22	0	1	0	1	0	1	0
8	95	23	0	2	0	2	0	1	0
8	100	10	0	9	0	4	0	3	0
8	105	6	0	11	0	7	0	4	0
8	110	4	0	7	0	4	0	3	0
8	115	5	0	6	0	2	0	2	0
8	120	3	0	6	0	2	0	2	0
8	125	2	0	4	0	1	0	1	0
8	130	1	0	5	0	1	0	1	0
8	135	0	0	3	0	1	0	1	0
8	140	1	0	3	0	0	0	1	0
8	145	0	0	2	0	0	0	1	0
8	150	0	0	1	0	0	0	0	0
8	155	0	0	0	0	0	0	0	0
8	160	0	0	0	0	0	0	0	0
8	165	0	0	0	0	0	0	0	0
8	170	0	0	0	0	0	0	0	0
8	175	0	0	0	0	0	0	0	0

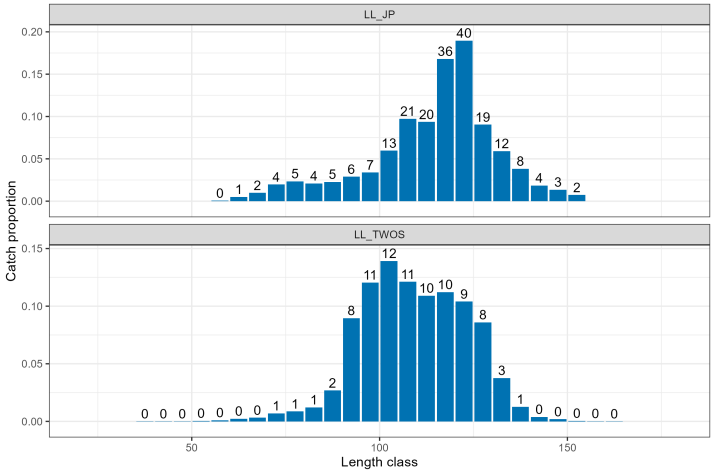


Figure D.2: The estimated length composition of yellowfin tuna catches in region 1 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

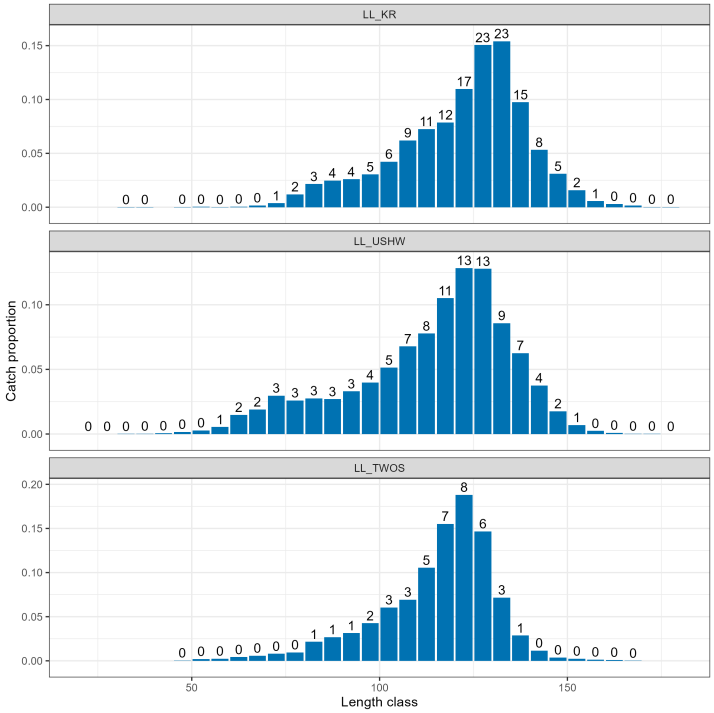


Figure D.3: The estimated length composition of yellowfin tuna catches in region 2 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

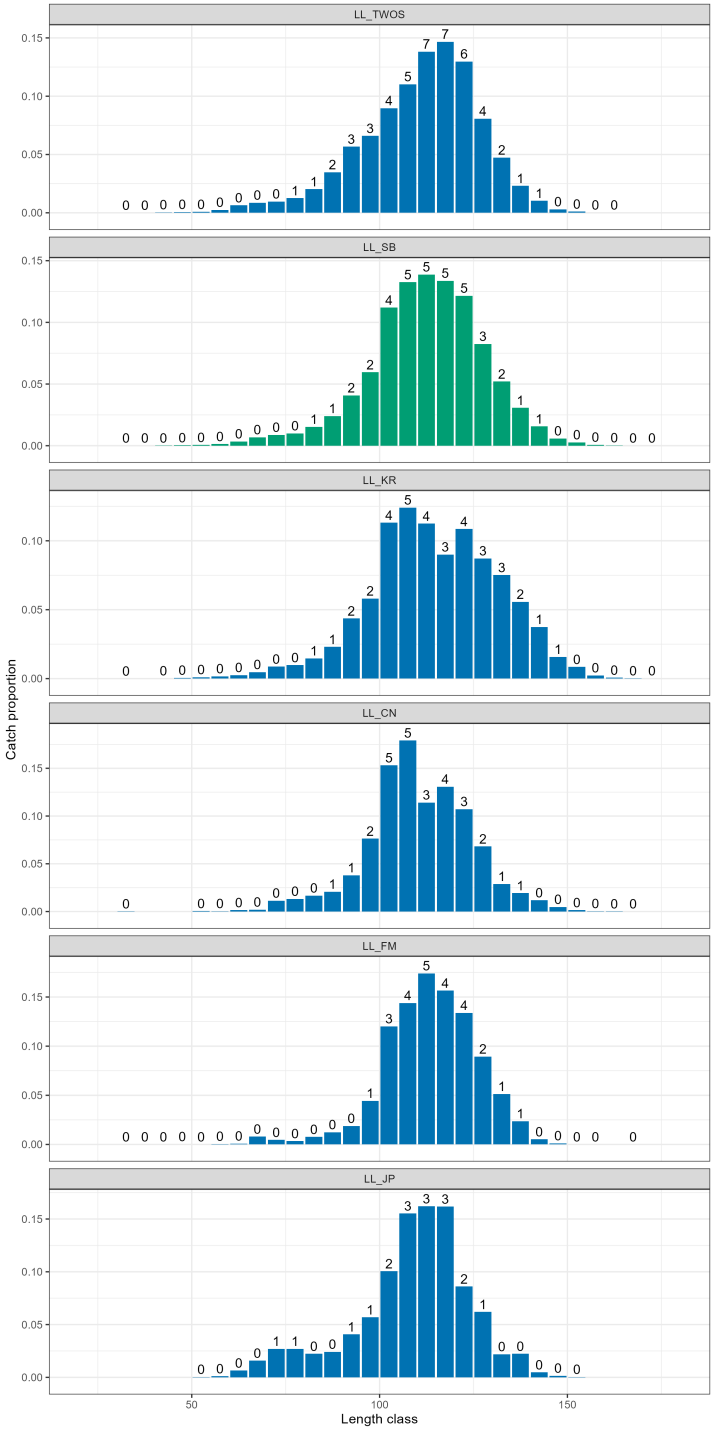


Figure D.4: The estimated length composition of yellowfin tuna catches in region 3 per longline sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

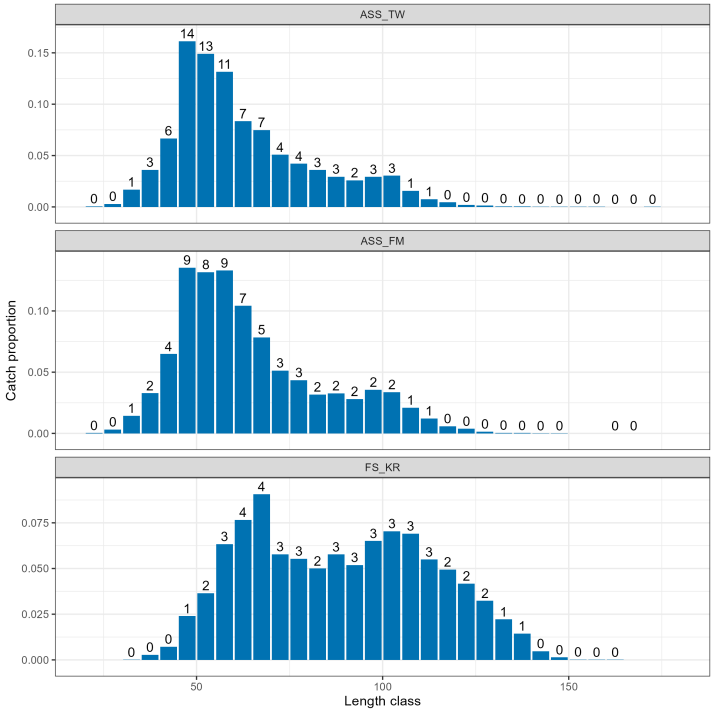


Figure D.5: The estimated length composition of yellowfin tuna catches in region 3 per purse seine sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

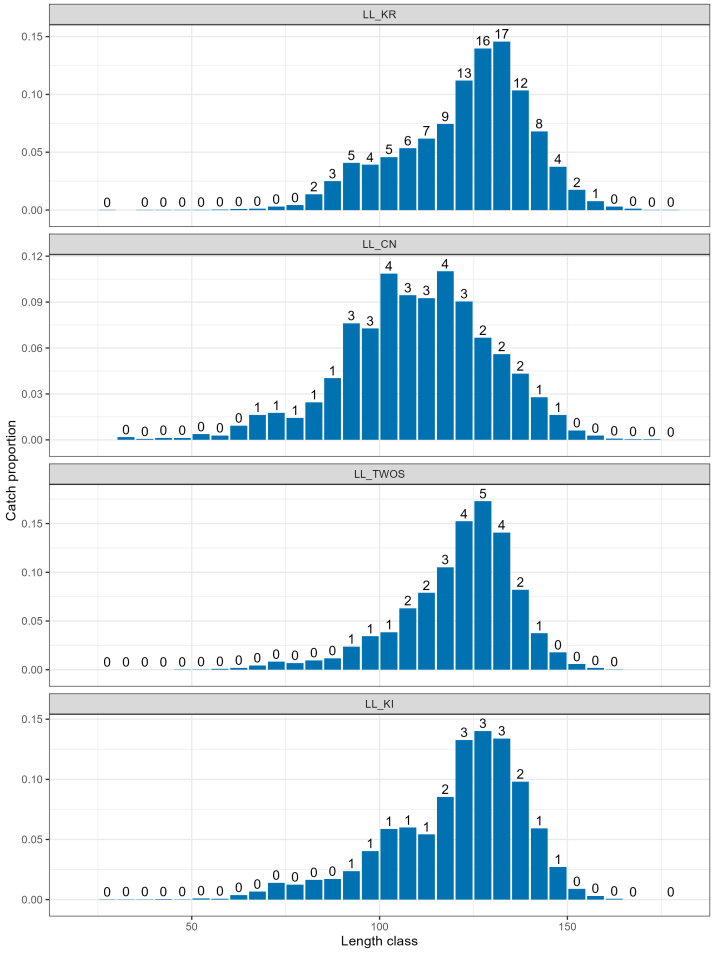


Figure D.6: The estimated length composition of yellowfin tuna catches in region 4 per longline sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

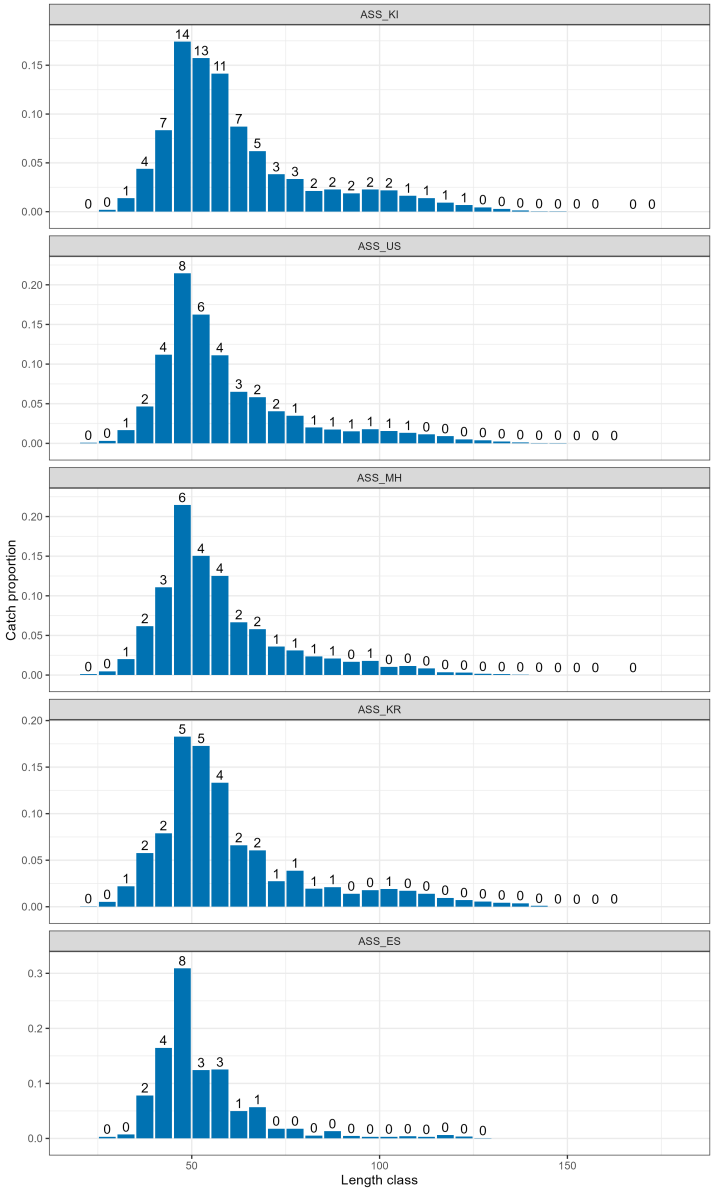


Figure D.7: The estimated length composition of yellowfin tuna catches in region 4 per purse seine sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

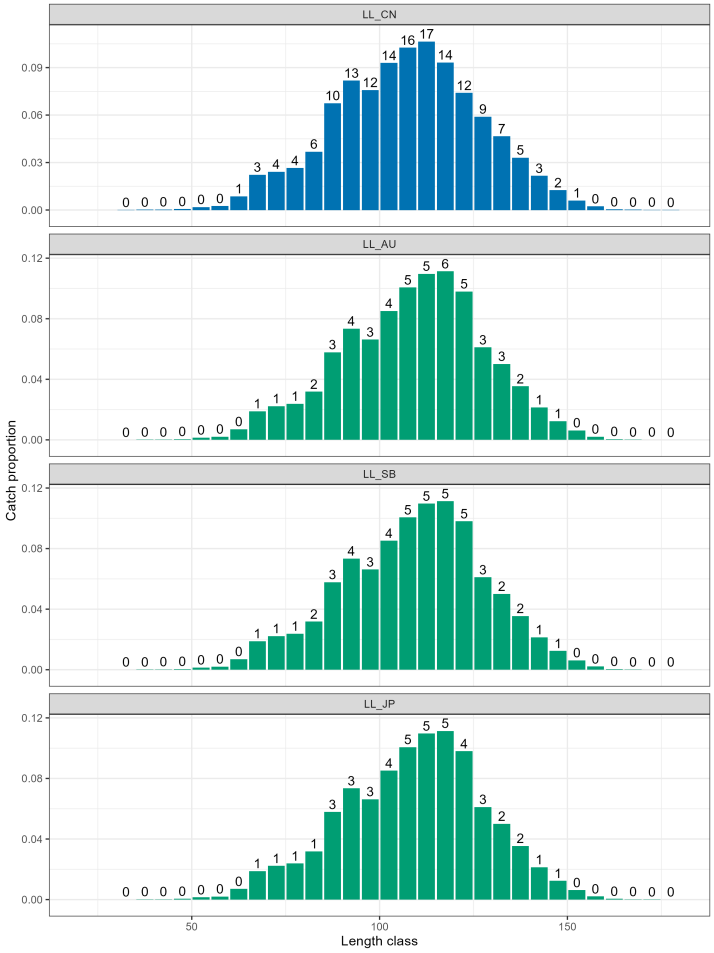


Figure D.8: The estimated length composition of yellowfin tuna catches in region 5 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

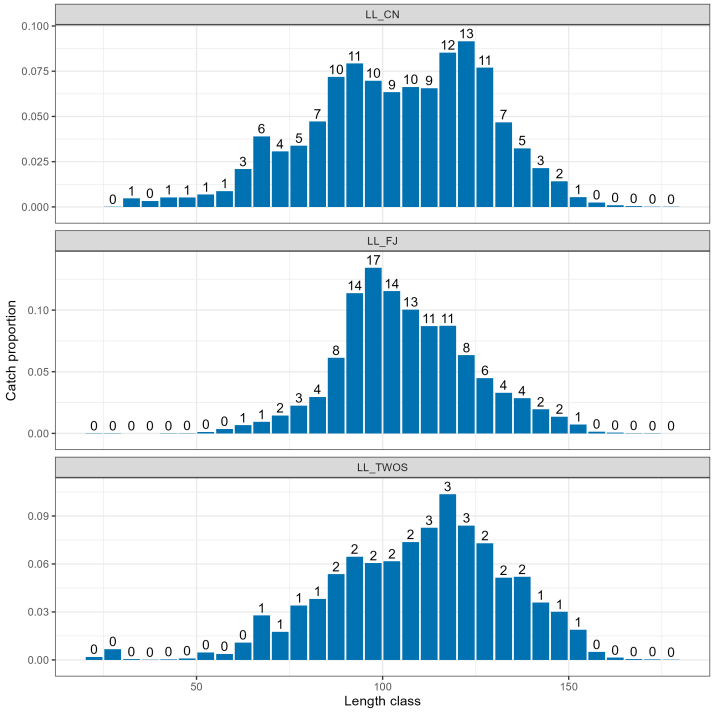


Figure D.9: The estimated length composition of yellowfin tuna catches in region 6 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

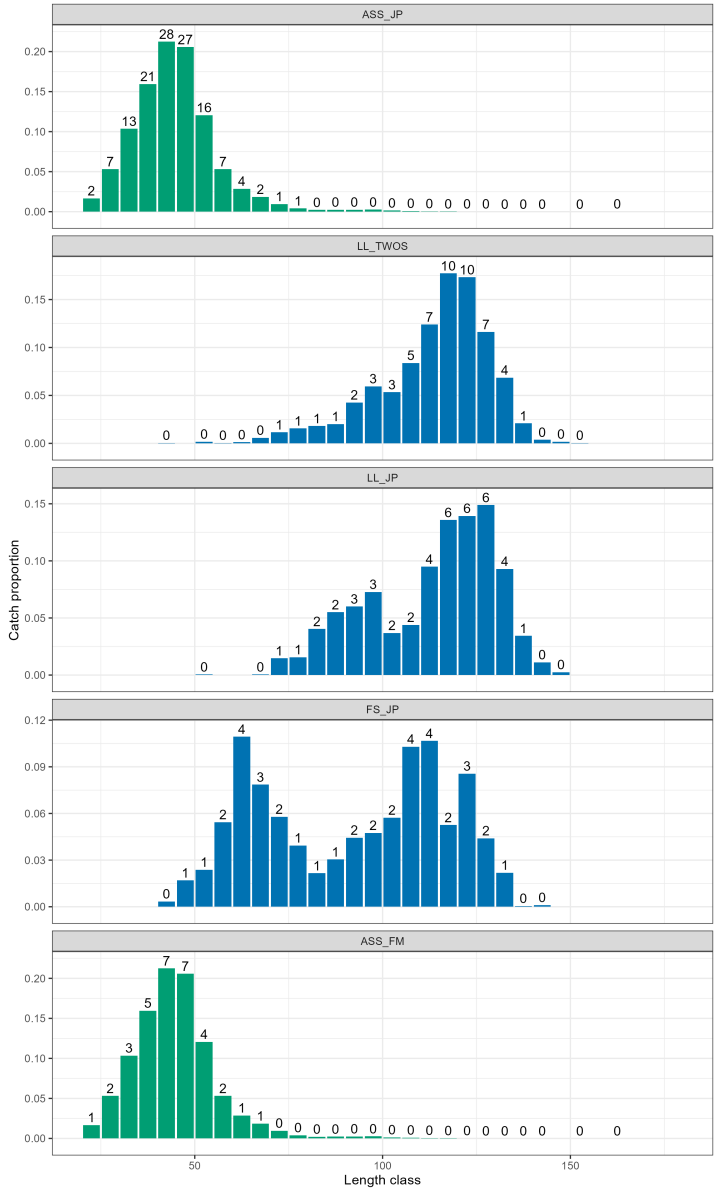


Figure D.10: The estimated length composition of yellowfin tuna catches in region 7 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

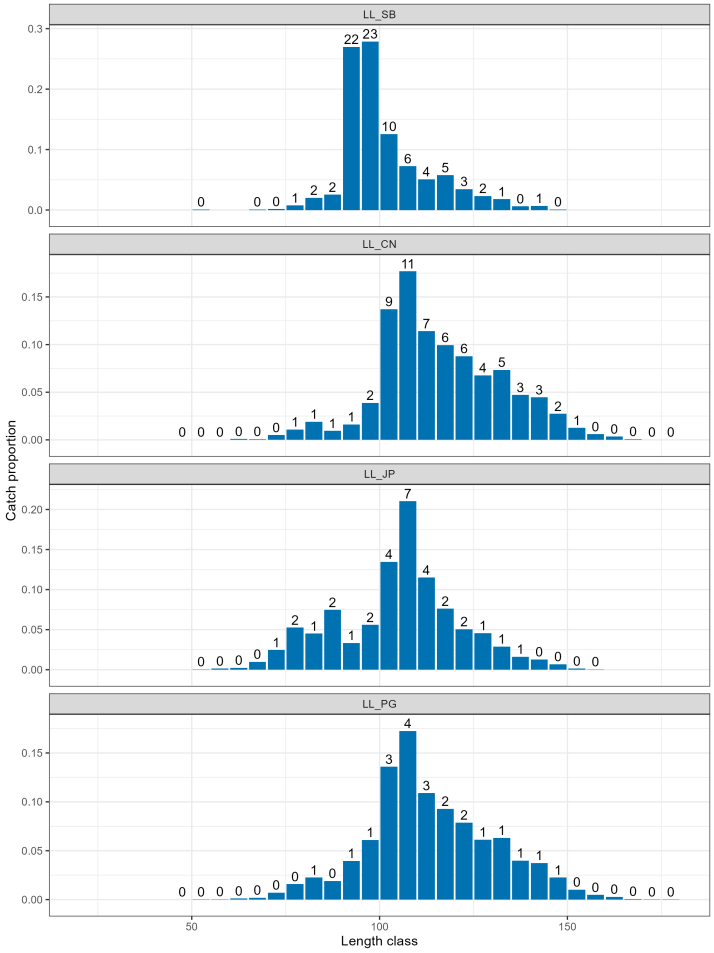


Figure D.11: The estimated length composition of yellowfin tuna catches in region 8 per longline sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

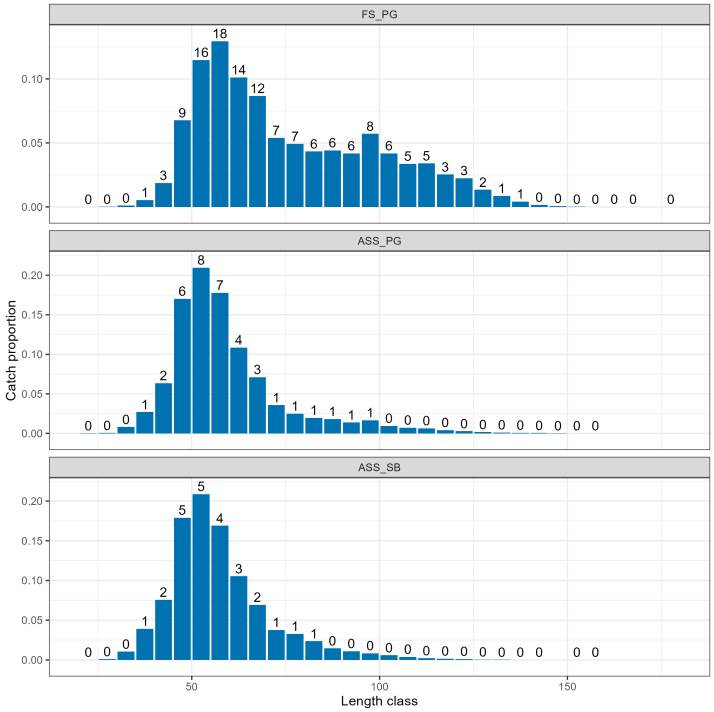


Figure D.12: The estimated length composition of yellowfin tuna catches in region 8 per purse seine sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

Table D.13: Yellowfin tuna: comparisons of target sample sizes for estimation of growth (Tar. growth, n) and maturity (Tar., mat., n) against available samples in the Pacific Marine Specimen Bank (PMSB growth and PMSB mat.), per region (Reg.).

Reg.	Tar. growth (n)	PMSB growth (n)	Tar. mat. (n)	PMSB mat. (n)
1	300	3	425	40
2	296	31	419	32
3	388	419	438	397
4	396	740	452	764
5	296	635	419	728
6	301	119	399	119
7	299	1763	379	1271
8	399	4051	462	4060

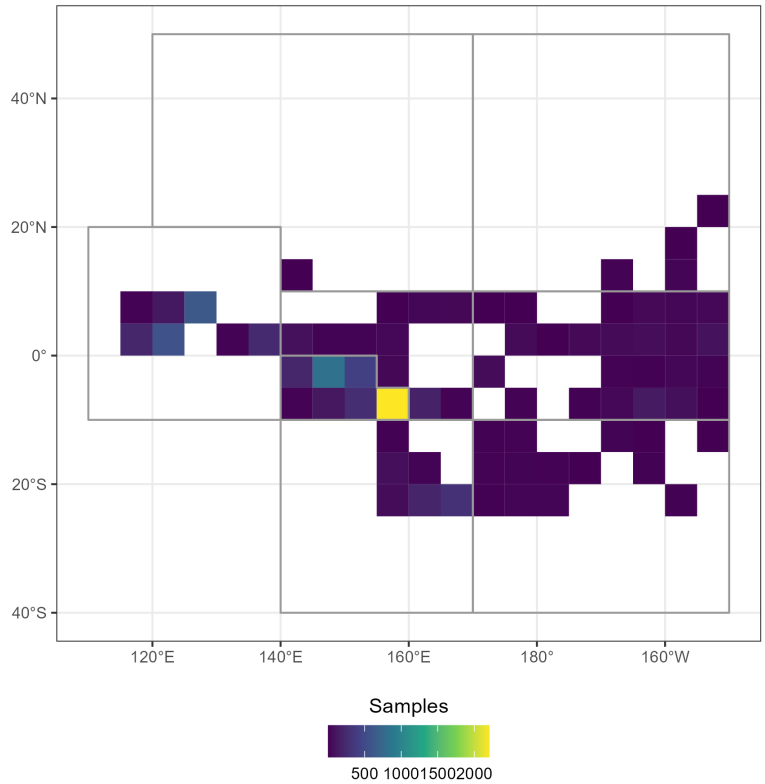


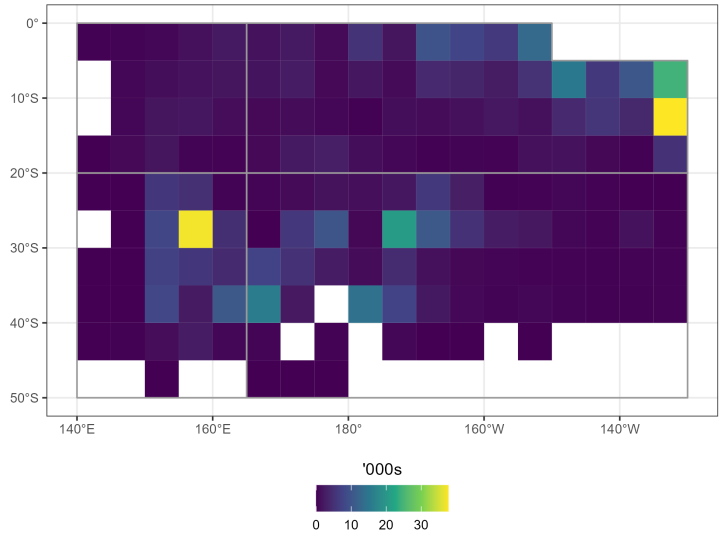
Figure D.13: Yellowfin tuna: Spatial distributions of available otoliths in the Pacific Marine Specimen Bank for estimation of age and growth for the period 2020–2024.

Table D.14: Yellowfin tuna: comparisons of target sample sizes for estimation of growth (Tar, n) against available samples in the Pacific Marine Specimen Bank (PMSB, n) by length class (Len., cm) for selected regions (3, 4, 5, 6, 7, 8).

Len. (cm)	3		4		5		6		7		8	
	Tar.	PMSB	Tar.	PMSB	Tar.	PMSB	Tar.	PMSB	Tar.	PMSB	Tar.	PMSB
15	0	0	0	0	0	0	0	0	0	396	0	0
20	0	0	0	0	0	0	0	0	3	61	0	0
25	0	0	0	1	0	0	0	0	9	12	0	1
30	2	3	4	23	0	0	1	0	16	12	0	2
35	5	8	12	36	0	0	0	0	26	36	3	33
40	10	23	20	13	0	1	1	0	35	133	7	120
45	24	112	41	19	0	4	1	0	35	163	20	1304
50	23	108	31	32	0	1	1	2	21	78	29	1172
55	23	20	26	65	0	0	1	2	11	25	29	576
60	18	23	15	56	1	0	4	1	9	10	21	264
65	16	5	13	35	6	0	8	4	6	7	17	124
70	11	11	8	13	7	0	7	7	5	3	10	93
75	12	11	7	24	7	0	9	11	4	0	13	71
80	10	7	8	16	11	0	12	8	4	1	13	58
85	13	4	9	27	19	0	20	17	4	0	12	27
90	16	4	13	90	24	5	27	24	7	0	32	25
95	19	2	13	79	21	6	29	10	8	0	37	18
100	30	4	15	63	26	10	25	8	7	6	32	40
105	32	8	14	61	31	41	25	2	11	24	33	38
110	32	17	14	44	32	70	23	4	15	35	23	37
115	28	30	19	31	30	72	26	4	18	88	18	25
120	26	14	24	6	26	79	24	3	19	197	16	17
125	17	4	26	2	18	81	19	1	15	205	10	5
130	10	1	26	0	14	78	13	5	9	129	9	1
135	7	0	18	1	11	59	11	3	2	88	6	0
140	3	0	11	1	6	42	6	3	0	34	5	0
145	1	0	6	2	5	53	5	0	0	10	3	0
150	0	0	2	0	1	21	3	0	0	7	1	0
155	0	0	1	0	0	6	0	0	0	2	0	0
160	0	0	0	0	0	0	0	0	0	1	0	0
165	0	0	0	0	0	1	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0
185	0	0	0	0	0	0	0	0	0	0	0	0
190	0	0	0	0	0	0	0	0	0	0	0	0
195	0	0	0	0	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0	0	0	0	0
205	0	0	0	0	0	0	0	0	0	0	0	0
210	0	0	0	0	0	0	0	0	0	0	0	0

E Swordfish

(a) Total reported catch



(b) Catch from sampled fleet-region combinations

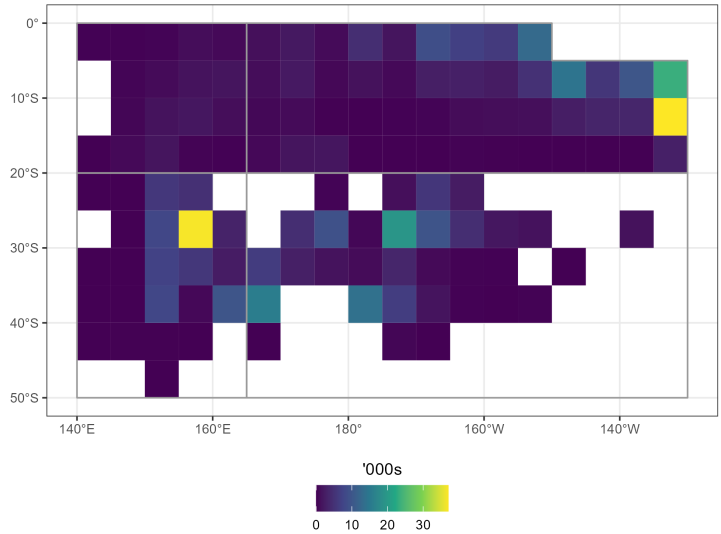


Figure E.1: Swordfish: Spatial distributions of a) total reported catches and b) reported catch from sampled fleet-region combinations from 2020–2024, with sampling as per the developed biological sampling plan.

Table E.1: Swordfish: average annual reported catch (Catch, thousands) and observed catch (Obs. catch, individuals), available length samples for estimation of length frequencies (LF samples, individuals), target biological sampling rate (Bio. samples, individuals), and maximum supplemental samples for estimation of maturity per length class (Mat. samples, individuals), per region (Reg.) and fleet (LL prefix denotes longline, see Section 2).

Region	Fleet	Catch ('000s)	Obs. catch (n)	LF samples (n)	Bio. samples (n)	Mat. samples (n)
1-A	LL-CN	1.2	164	772	145	5
1-A	LL-SB	0.9	3	11	101	3
1-A	LL-AU	0.5	0	0	54	2
1-B	LL-TWDW	13.6	476	2200	118	4
1-B	LL-CN	7.4	332	1522	65	2
1-B	LL-KR	6.7	199	2461	58	2
1-B	LL-VU	3.7	0	2	32	1
1-B	LL-KI	3.2	214	953	28	1
2-A	LL-AU	15.8	0	0	260	9
2-A	LL-ES	2.5	60	292	40	1
2-B	LL-ES	22.9	1117	2686	300	10

Table E.2: Swordfish - region 1-A: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-CN		LL-SB		LL-AU	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
1-A	40	0	5	0	3	0	2
1-A	50	1	4	0	3	0	2
1-A	60	2	3	1	2	1	1
1-A	70	1	4	1	2	0	2
1-A	80	1	4	0	3	0	2
1-A	90	0	5	0	3	0	2
1-A	100	1	4	1	2	0	2
1-A	110	3	2	2	1	1	1
1-A	120	12	0	9	0	5	0
1-A	130	17	0	12	0	6	0
1-A	140	18	0	13	0	7	0
1-A	150	29	0	20	0	11	0
1-A	160	22	0	15	0	8	0
1-A	170	10	0	7	0	4	0
1-A	180	9	0	6	0	3	0
1-A	190	3	0	2	0	1	0
1-A	200	5	0	3	0	2	0
1-A	210	4	0	3	0	2	0
1-A	220	4	0	2	0	1	0
1-A	230	1	0	1	0	0	0
1-A	240	2	0	1	0	1	0

Table E.3: Swordfish - region 1-B: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-TWDW		LL-CN		LL-KR		LL-VU		LL-KI	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
1-B	40	0	4	0	2	0	2	0	1	0	1
1-B	50	0	4	1	1	0	2	0	1	0	1
1-B	60	3	1	2	0	2	0	1	0	1	0
1-B	70	7	0	2	0	3	0	1	0	1	0
1-B	80	5	0	2	0	1	1	1	0	1	0
1-B	90	4	0	1	1	1	1	1	0	1	0
1-B	100	4	0	1	1	2	0	1	0	1	0
1-B	110	6	0	2	0	3	0	1	0	1	0
1-B	120	8	0	3	0	3	0	2	0	2	0
1-B	130	10	0	4	0	6	0	3	0	2	0
1-B	140	10	0	3	0	7	0	3	0	3	0
1-B	150	11	0	5	0	6	0	3	0	3	0
1-B	160	8	0	5	0	6	0	3	0	3	0
1-B	170	8	0	5	0	4	0	3	0	2	0
1-B	180	9	0	5	0	4	0	2	0	2	0
1-B	190	9	0	5	0	4	0	2	0	2	0
1-B	200	5	0	6	0	2	0	2	0	1	0
1-B	210	4	0	5	0	1	0	1	0	1	0
1-B	220	3	0	3	0	2	0	1	0	1	0
1-B	230	2	0	1	0	1	0	0	0	0	0
1-B	240	1	0	1	0	0	0	0	0	0	0
1-B	250	0	0	0	0	0	0	0	0	0	0
1-B	260	0	0	0	0	0	0	0	0	0	0
1-B	270	0	0	0	0	0	0	0	0	0	0
1-B	280	0	0	0	0	0	0	0	0	0	0
1-B	290	0	0	0	0	0	0	0	0	0	0
1-B	300	0	0	0	0	0	0	0	0	0	0
1-B	310	0	0	0	0	0	0	0	0	0	0
1-B	320	0	0	0	0	0	0	0	0	0	0
1-B	330	0	0	0	0	0	0	0	0	0	0
1-B	340	0	0	0	0	0	0	0	0	0	0
1-B	350	0	0	0	0	0	0	0	0	0	0

Table E.4: Swordfish - region 2-A: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-AU		LL-ES	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)
2-A	40	0	9	0	1
2-A	50	0	9	0	1
2-A	60	0	9	0	1
2-A	70	1	8	0	1
2-A	80	2	7	0	1
2-A	90	11	0	2	0
2-A	100	36	0	6	0
2-A	110	46	0	7	0
2-A	120	25	0	4	0
2-A	130	12	0	2	0
2-A	140	12	0	2	0
2-A	150	11	0	2	0
2-A	160	20	0	3	0
2-A	170	14	0	2	0
2-A	180	18	0	3	0
2-A	190	9	0	1	0
2-A	200	12	0	2	0
2-A	210	10	0	2	0
2-A	220	8	0	1	0
2-A	230	4	0	1	0
2-A	240	3	0	0	0
2-A	250	3	0	0	0
2-A	260	1	0	0	0
2-A	270	3	0	0	0

Table E.5: Swordfish - region 2-B: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-ES	
		Bio (n)	Mat (n)
2-B	40	0	10
2-B	50	0	10
2-B	60	0	10
2-B	70	0	10
2-B	80	0	10
2-B	90	1	9
2-B	100	17	0
2-B	110	30	0
2-B	120	34	0
2-B	130	31	0
2-B	140	26	0
2-B	150	27	0
2-B	160	24	0
2-B	170	23	0
2-B	180	23	0
2-B	190	18	0
2-B	200	16	0
2-B	210	10	0
2-B	220	6	0
2-B	230	5	0
2-B	240	4	0
2-B	250	1	0
2-B	260	1	0
2-B	270	1	0
2-B	280	1	0
2-B	290	0	0

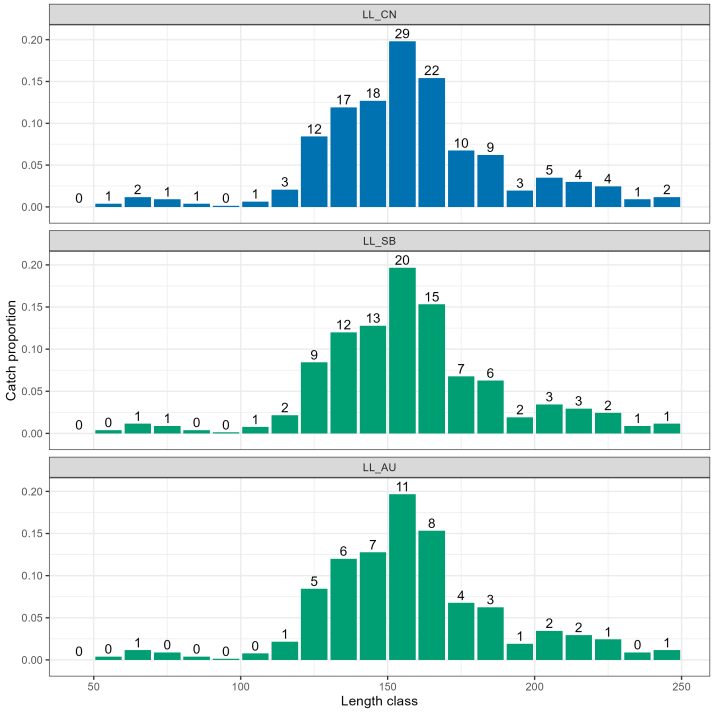


Figure E.2: The estimated length composition of swordfish catches in region 1-A per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

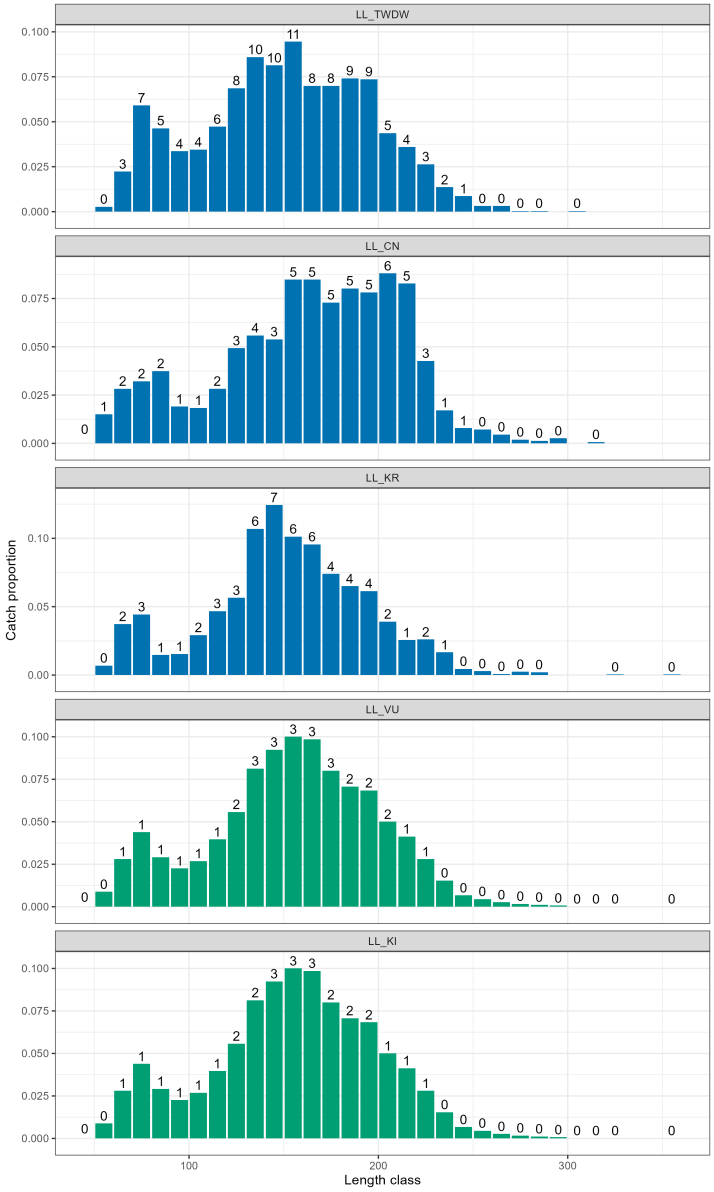


Figure E.3: The estimated length composition of swordfish catches in region 1-B per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

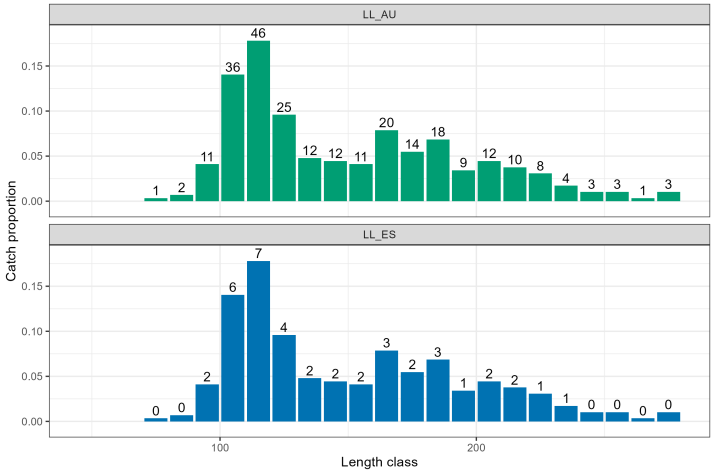


Figure E.4: The estimated length composition of swordfish catches in region 2-A per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

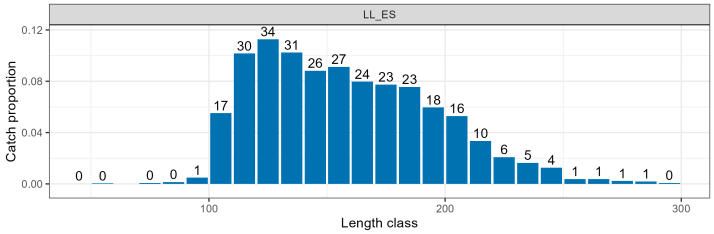


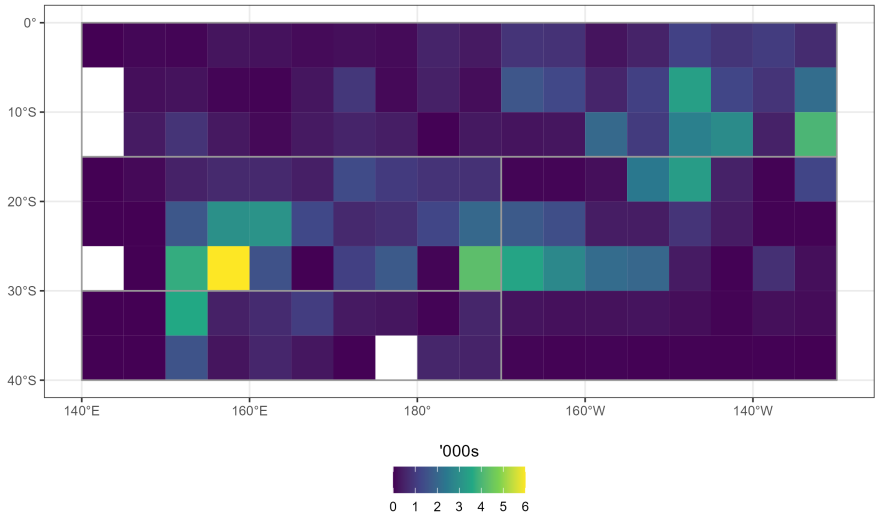
Figure E.5: The estimated length composition of swordfish catches in region 2-B per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

Table E.6: Swordfish: comparisons of target sample sizes for estimation of growth (Tar. growth, n) and maturity (Tar., mat., n) against available samples in the Pacific Marine Specimen Bank (PMSB growth and PMSB mat.), per region (Reg.).

Reg.	Tar. growth (n)	PMSB growth (n)	Tar. mat. (n)	PMSB mat. (n)
1-A	297	0	361	0
1-B	296	6	320	10
2-A	301	0	348	0
2-B	299	4	358	4

F Striped marlin

(a) Total reported catch



(b) Catch from sampled fleet-region combinations

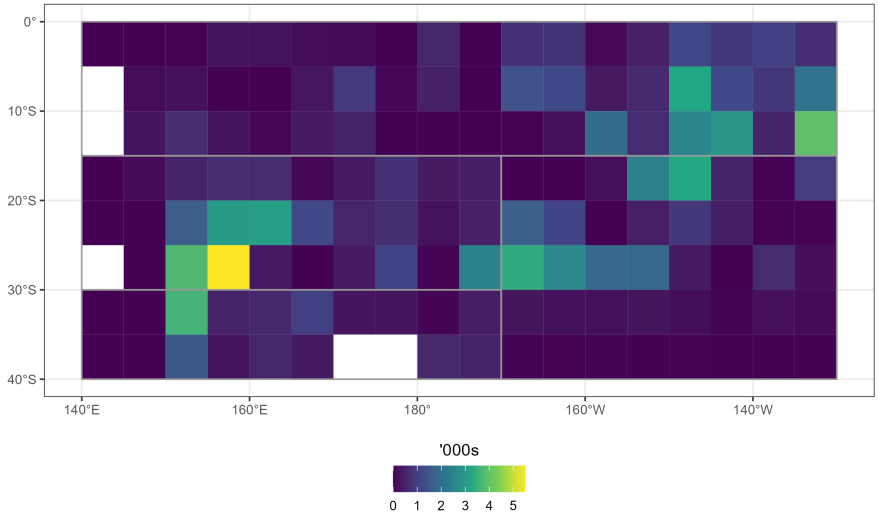


Figure F.1: Striped marlin: Spatial distributions of a) total reported catches and b) reported catch from sampled fleet-region combinations from 2020–2024, with sampling as per the developed biological sampling plan.

Table F.1: Striped marlin: average annual reported catch (Catch, thousands) and observed catch (Obs. catch, individuals), available length samples for estimation of length frequencies (LF samples, individuals), target biological sampling rate (Bio. samples, individuals), and maximum supplemental samples for estimation of maturity per length class (Mat. samples, individuals), per region (Reg.) and fleet (LL prefix denotes longline, see Section 2).

Region	Fleet	Catch ('000s)	Obs. catch (n)	LF samples (n)	Bio. samples (n)	Mat. samples (n)
1	LL-TWDW	1.9	92	445	84	3
1	LL-CN	1.5	152	569	66	2
1	LL-KR	1.1	17	336	49	2
1	LL-PF	0.9	48	263	38	1
1	LL-TWOS	0.8	52	255	35	1
1	LL-VU	0.6	0	1	27	1
2	LL-AU	2.6	0	0	139	5
2	LL-NC	1.5	139	615	82	3
2	LL-ES	0.8	2	0	42	1
2	LL-FJ	0.7	338	1737	37	1
3	LL-AU	1.1	0	0	167	6
3	LL-ES	0.4	28	58	63	2
3	LL-JP	0.3	50	248	41	1
3	LL-TWDW	0.2	5	25	29	1
4	LL-PF	1.6	41	249	99	3
4	LL-TWOS	1.1	60	293	72	2
4	LL-ES	0.8	81	5	47	2
4	LL-TWDW	0.7	15	76	43	1
4	LL-VU	0.6	39	143	39	1

Table F.2: Striped marlin - region 1: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-TWDW		LL-CN		LL-KR		LL-PF		LL-TWOS		LL-VU	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
1	70	0	3	0	2	0	2	0	1	0	1	0	1
1	75	0	3	0	2	0	2	0	1	0	1	0	1
1	80	0	3	0	2	0	2	0	1	0	1	0	1
1	85	0	3	0	2	0	2	0	1	1	0	0	1
1	90	0	3	0	2	0	2	0	1	1	0	0	1
1	95	0	3	1	1	0	2	0	1	2	0	0	1
1	100	0	3	0	2	0	2	0	1	2	0	0	1
1	105	0	3	0	2	0	2	0	1	2	0	0	1
1	110	0	3	0	2	0	2	0	1	1	0	0	1
1	115	0	3	0	2	0	2	0	1	0	1	0	1
1	120	1	2	1	1	0	2	0	1	1	0	0	1
1	125	0	3	1	1	0	2	0	1	1	0	0	1
1	130	0	3	1	1	0	2	0	1	1	0	0	1
1	135	0	3	2	0	0	2	0	1	1	0	0	1
1	140	1	2	2	0	0	2	1	0	1	0	0	1
1	145	1	0	4	0	1	0	1	0	3	0	0	0
1	150	3	0	5	0	1	0	3	0	2	0	1	0
1	155	4	0	7	0	1	0	3	0	2	0	1	0
1	160	7	0	7	0	1	0	4	0	2	0	2	0
1	165	8	0	7	0	1	0	4	0	3	0	3	0
1	170	17	0	7	0	2	0	4	0	3	0	5	0
1	175	16	0	8	0	4	0	6	0	3	0	5	0
1	180	13	0	5	0	4	0	3	0	1	0	4	0
1	185	6	0	3	0	3	0	2	0	1	0	2	0
1	190	4	0	1	0	3	0	2	0	0	0	1	0
1	195	2	0	1	0	3	0	1	0	0	0	0	0
1	200	1	0	1	0	4	0	0	0	0	0	0	0
1	205	0	0	0	0	4	0	1	0	0	0	0	0
1	210	0	0	0	0	5	0	0	0	0	0	0	0
1	215	0	0	0	0	5	0	0	0	0	0	0	0
1	220	0	0	0	0	3	0	0	0	0	0	0	0
1	225	0	0	0	0	1	0	0	0	0	0	0	0
1	230	0	0	0	0	0	0	0	0	0	0	0	0
1	235	0	0	0	0	0	0	0	0	0	0	0	0
1	240	0	0	0	0	0	0	0	0	0	0	0	0
1	245	0	0	0	0	0	0	0	0	0	0	0	0
1	250	0	0	0	0	0	0	0	0	0	0	0	0
1	255	0	0	0	0	0	0	0	0	0	0	0	0
1	260	0	0	0	0	0	0	0	0	0	0	0	0
1	265	0	0	0	0	0	0	0	0	0	0	0	0

Table F.3: Striped marlin - region 2: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-AU		LL-NC		LL-ES		LL-FJ	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
2	70	0	5	0	3	0	1	0	1
2	75	0	5	0	3	0	1	0	1
2	80	0	5	0	3	0	1	0	1
2	85	1	4	0	3	0	1	0	1
2	90	1	4	0	3	0	1	0	1
2	95	0	5	0	3	0	1	0	1
2	100	1	4	0	3	0	1	0	1
2	105	1	4	1	2	0	1	0	1
2	110	1	4	1	2	0	1	0	1
2	115	1	4	1	2	0	1	0	1
2	120	1	4	0	3	0	1	0	1
2	125	2	3	0	3	1	0	1	0
2	130	2	3	0	3	1	0	1	0
2	135	4	1	1	2	1	0	1	0
2	140	3	2	1	2	1	0	1	0
2	145	6	0	1	0	2	0	2	0
2	150	6	0	1	0	2	0	2	0
2	155	6	0	1	0	2	0	2	0
2	160	8	0	3	0	2	0	2	0
2	165	12	0	3	0	4	0	4	0
2	170	21	0	7	0	6	0	6	0
2	175	19	0	11	0	6	0	5	0
2	180	15	0	13	0	4	0	3	0
2	185	8	0	9	0	2	0	1	0
2	190	5	0	7	0	2	0	1	0
2	195	3	0	4	0	1	0	1	0
2	200	3	0	5	0	1	0	0	0
2	205	2	0	4	0	1	0	0	0
2	210	1	0	2	0	0	0	0	0
2	215	1	0	1	0	0	0	0	0
2	220	1	0	0	0	0	0	0	0
2	225	0	0	0	0	0	0	0	0
2	230	0	0	0	0	0	0	0	0
2	235	0	0	1	0	0	0	0	0
2	240	0	0	0	0	0	0	0	0
2	245	0	0	0	0	0	0	0	0
2	250	0	0	0	0	0	0	0	0
2	255	0	0	0	0	0	0	0	0
2	260	0	0	0	0	0	0	0	0
2	265	0	0	0	0	0	0	0	0
2	270	0	0	0	0	0	0	0	0

Table F.4: Striped marlin - region 3: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-AU		LL-ES		LL-JP		LL-TWDW	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
3	70	0	6	0	2	0	1	0	1
3	75	0	6	0	2	0	1	0	1
3	80	0	6	0	2	0	1	0	1
3	85	0	6	0	2	0	1	0	1
3	90	0	6	0	2	0	1	0	1
3	95	0	6	0	2	0	1	0	1
3	100	0	6	0	2	0	1	0	1
3	105	0	6	0	2	0	1	0	1
3	110	0	6	0	2	0	1	0	1
3	115	0	6	0	2	0	1	0	1
3	120	0	6	0	2	0	1	0	1
3	125	0	6	0	2	0	1	0	1
3	130	0	6	0	2	0	1	0	1
3	135	0	6	0	2	0	1	0	1
3	140	0	6	0	2	0	1	0	1
3	145	0	0	0	0	0	0	0	0
3	150	0	0	0	0	0	0	0	0
3	155	0	0	0	0	0	0	0	0
3	160	1	0	0	0	0	0	0	0
3	165	8	0	3	0	1	0	1	0
3	170	23	0	9	0	4	0	4	0
3	175	27	0	10	0	7	0	5	0
3	180	30	0	11	0	9	0	5	0
3	185	28	0	10	0	7	0	5	0
3	190	17	0	6	0	5	0	3	0
3	195	12	0	4	0	3	0	2	0
3	200	8	0	3	0	2	0	1	0
3	205	7	0	3	0	2	0	1	0
3	210	4	0	1	0	1	0	1	0
3	215	2	0	1	0	0	0	0	0
3	220	2	0	1	0	0	0	0	0
3	225	1	0	0	0	0	0	0	0
3	230	1	0	0	0	0	0	0	0

Table F.5: Striped marlin - region 4: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-PF		LL-TWOS		LL-ES		LL-TWDW		LL-VU	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
4	70	0	3	0	2	0	2	0	1	0	1
4	75	0	3	0	2	0	2	0	1	0	1
4	80	0	3	0	2	0	2	0	1	0	1
4	85	0	3	0	2	0	2	0	1	0	1
4	90	0	3	0	2	0	2	0	1	0	1
4	95	0	3	0	2	0	2	0	1	0	1
4	100	0	3	0	2	0	2	0	1	0	1
4	105	0	3	0	2	0	2	0	1	0	1
4	110	0	3	0	2	0	2	0	1	0	1
4	115	1	2	0	2	0	2	0	1	0	1
4	120	1	2	0	2	0	2	0	1	0	1
4	125	2	1	1	1	1	1	1	0	0	1
4	130	2	1	0	2	0	2	0	1	0	1
4	135	2	1	0	2	0	2	0	1	0	1
4	140	2	1	0	2	0	2	0	1	0	1
4	145	5	0	0	0	1	0	1	0	0	0
4	150	10	0	1	0	2	0	2	0	0	0
4	155	8	0	2	0	2	0	2	0	1	0
4	160	9	0	5	0	3	0	3	0	0	0
4	165	12	0	9	0	5	0	4	0	0	0
4	170	11	0	11	0	6	0	5	0	2	0
4	175	7	0	10	0	5	0	5	0	2	0
4	180	8	0	10	0	6	0	6	0	7	0
4	185	4	0	7	0	4	0	4	0	5	0
4	190	3	0	5	0	3	0	2	0	2	0
4	195	3	0	5	0	3	0	2	0	4	0
4	200	2	0	2	0	2	0	2	0	4	0
4	205	0	0	1	0	1	0	1	0	5	0
4	210	1	0	0	0	1	0	1	0	3	0
4	215	1	0	0	0	0	0	0	0	0	0
4	220	1	0	0	0	0	0	0	0	1	0
4	225	0	0	0	0	0	0	0	0	1	0
4	230	1	0	0	0	0	0	0	0	0	0
4	235	0	0	0	0	0	0	0	0	1	0
4	240	0	0	0	0	0	0	0	0	1	0
4	245	0	0	0	0	0	0	0	0	0	0
4	250	0	0	0	0	0	0	0	0	0	0
4	255	0	0	0	0	0	0	0	0	0	0
4	260	0	0	0	0	0	0	0	0	0	0
4	265	0	0	0	0	0	0	0	0	0	0
4	270	0	0	0	0	0	0	0	0	0	0

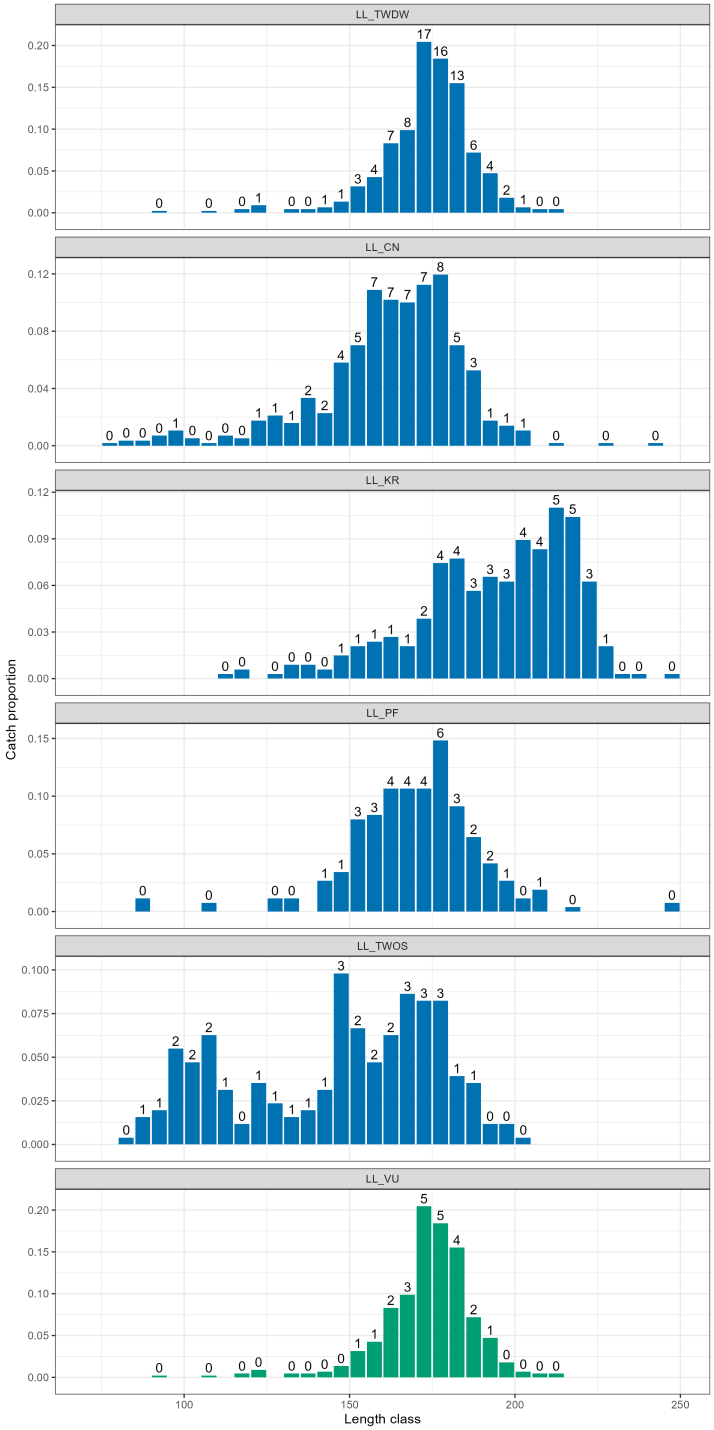


Figure F.2: The estimated length composition of striped marlin catches in region 1 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

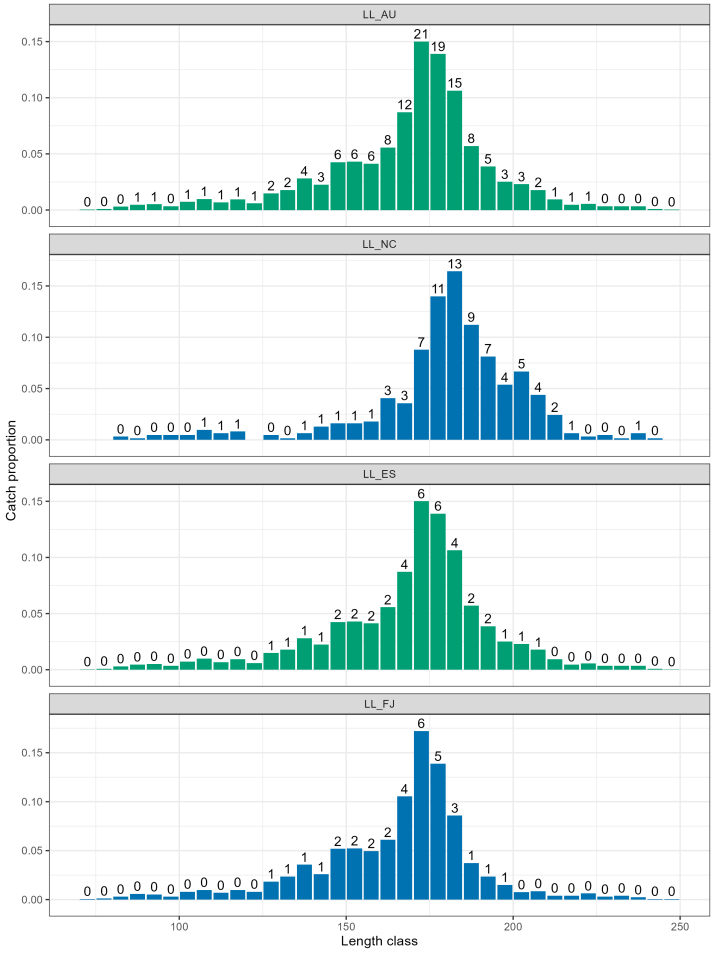


Figure F.3: The estimated length composition of striped marlin catches in region 2 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

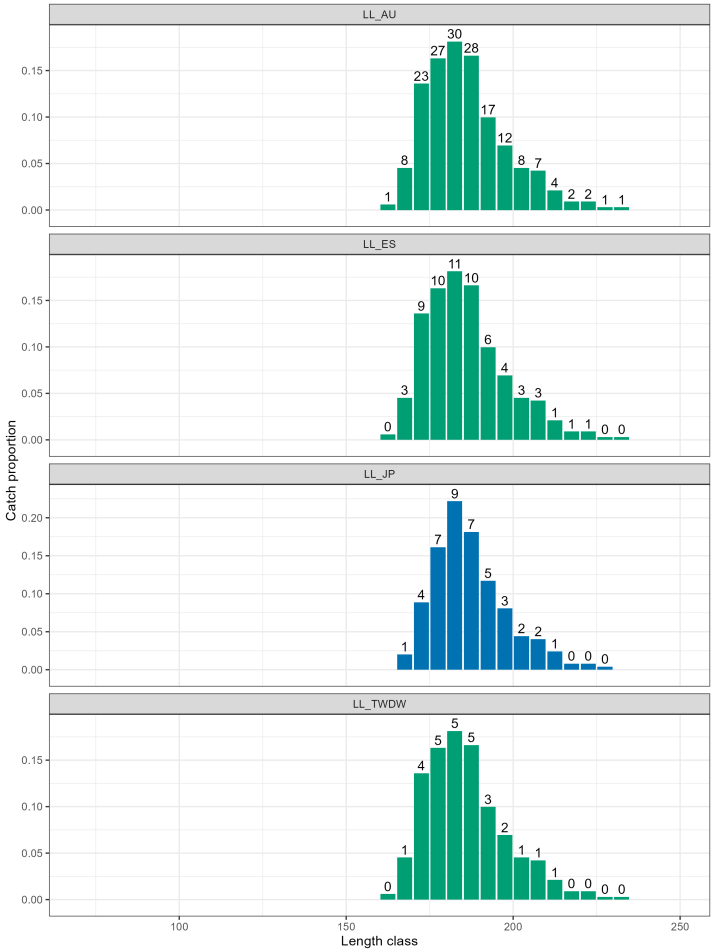


Figure F.4: The estimated length composition of striped marlin catches in region 3 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

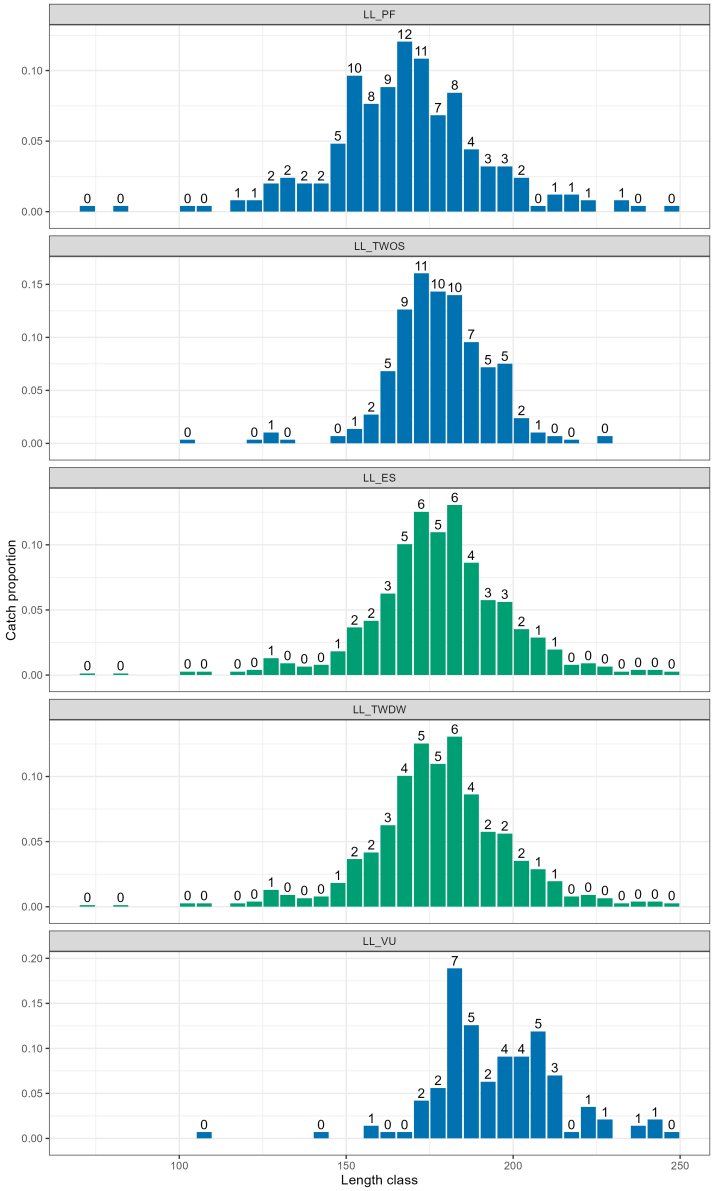


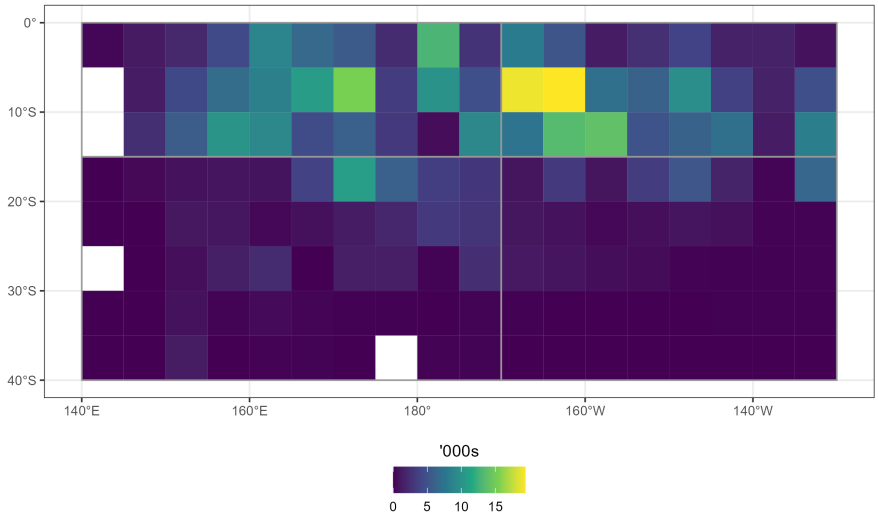
Figure F.5: The estimated length composition of striped marlin catches in region 4 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

Table F.6: Striped marlin: comparisons of target sample sizes for estimation of growth (Tar. growth, n) and maturity (Tar., mat., n) against available samples in the Pacific Marine Specimen Bank (PMSB growth and PMSB mat.), per region (Reg.).

Reg.	Tar. growth (n)	PMSB growth (n)	Tar. mat. (n)	PMSB mat. (n)
1	287	3	415	4
2	285	13	404	14
3	302	0	452	0
4	290	0	412	0

G Blue marlin

(a) Total reported catch



(b) Catch from sampled fleet-region combinations

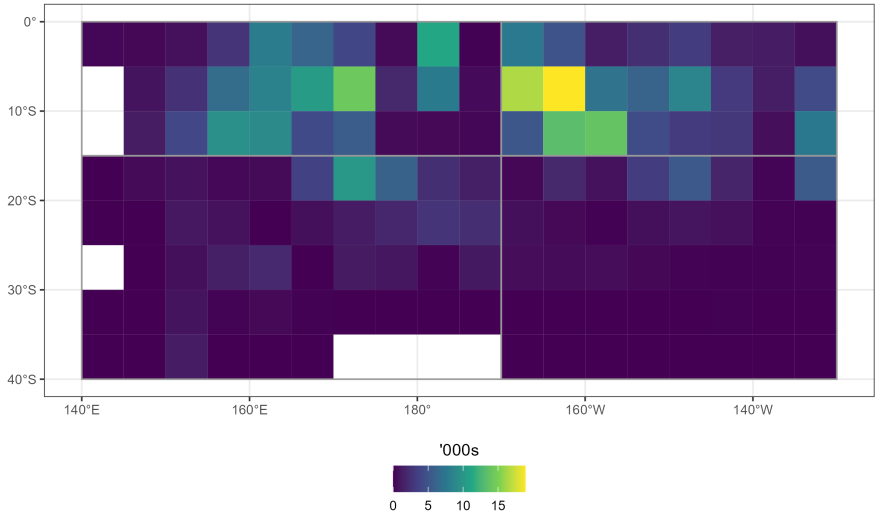


Figure G.1: Blue marlin: Spatial distributions of a) total reported catches and b) reported catch from sampled fleet-region combinations from 2020–2024, with sampling as per the developed biological sampling plan.

Table G.1: Blue marlin: average annual reported catch (Catch, thousands) and observed catch (Obs. catch, individuals), available length samples for estimation of length frequencies (LF samples, individuals), target biological sampling rate (Bio. samples, individuals), and maximum supplemental samples for estimation of maturity per length class (Mat. samples, individuals), per region (Reg.) and fleet (LL prefix denotes longline, see Section 2).

Region	Fleet	Catch ('000s)	Obs. catch (n)	LF samples (n)	Bio. samples (n)	Mat. samples (n)
1	LL-CN	8.5	268	1203	106	4
1	LL-KR	6.8	174	3308	85	3
1	LL-SB	5.2	16	56	65	2
1	LL-TWOS	3.5	237	1123	44	1
2	LL-CN	10.2	267	1196	110	4
2	LL-TWOS	5.1	211	1028	55	2
2	LL-TWDW	3.7	172	800	40	1
2	LL-KR	3.2	42	1221	35	1
2	LL-FM	2.8	63	298	30	1
2	LL-KI	2.7	315	1077	30	1
3	LL-CN	4.2	66	296	141	5
3	LL-FJ	2.5	332	1658	85	3
3	LL-AU	1.3	0	0	44	1
3	LL-TO	0.9	73	3172	29	1
4	LL-PF	2.5	63	452	160	5
4	LL-CN	1.2	64	287	76	3
4	LL-TWOS	1.0	54	266	64	2

Table G.2: Blue marlin - region 1: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-CN		LL-KR		LL-SB		LL-TWOS	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
1	40	0	4	0	3	0	2	0	1
1	50	0	4	0	3	0	2	0	1
1	60	0	4	0	3	0	2	0	1
1	70	0	4	0	3	0	2	0	1
1	80	2	2	0	3	0	2	0	1
1	90	1	3	0	3	0	2	0	1
1	100	1	3	0	3	0	2	0	1
1	110	0	4	0	3	0	2	0	1
1	120	1	3	1	2	0	2	0	1
1	130	1	3	2	1	1	1	1	0
1	140	4	0	5	0	3	0	1	0
1	150	10	0	6	0	6	0	4	0
1	160	19	0	13	0	11	0	9	0
1	170	18	0	19	0	14	0	12	0
1	180	20	0	18	0	13	0	8	0
1	190	12	0	8	0	6	0	4	0
1	200	8	0	5	0	4	0	2	0
1	210	6	0	4	0	3	0	1	0
1	220	2	0	2	0	2	0	1	0
1	230	1	0	1	0	1	0	0	0
1	240	0	0	0	0	0	0	0	0
1	250	0	0	0	0	0	0	0	0
1	260	0	0	0	0	0	0	0	0
1	270	0	0	0	0	0	0	0	0
1	280	0	0	0	0	0	0	0	0
1	290	0	0	0	0	0	0	0	0
1	300	0	0	0	0	0	0	0	0
1	310	0	0	0	0	0	0	0	0

Table G.3: Blue marlin - region 2: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-CN		LL-TWOS		LL-TWDW		LL-KR		LL-FM		LL-KI	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
2	40	0	4	0	2	0	1	0	1	0	1	0	1
2	50	0	4	0	2	0	1	0	1	0	1	0	1
2	60	0	4	0	2	0	1	0	1	0	1	0	1
2	70	0	4	0	2	0	1	0	1	0	1	0	1
2	80	0	4	0	2	0	1	0	1	0	1	0	1
2	90	0	4	0	2	0	1	0	1	0	1	0	1
2	100	0	4	0	2	0	1	0	1	0	1	0	1
2	110	0	4	0	2	0	1	0	1	0	1	0	1
2	120	0	4	0	2	0	1	0	1	0	1	0	1
2	130	1	3	0	2	0	1	0	1	0	1	1	0
2	140	3	1	1	1	1	0	1	0	0	1	2	0
2	150	7	0	3	0	2	0	1	0	1	0	3	0
2	160	12	0	8	0	2	0	3	0	4	0	4	0
2	170	23	0	15	0	6	0	5	0	6	0	9	0
2	180	22	0	13	0	8	0	6	0	6	0	5	0
2	190	19	0	6	0	7	0	4	0	4	0	2	0
2	200	8	0	4	0	5	0	4	0	4	0	1	0
2	210	7	0	2	0	3	0	3	0	2	0	1	0
2	220	3	0	1	0	2	0	3	0	1	0	0	0
2	230	2	0	1	0	2	0	2	0	1	0	0	0
2	240	1	0	0	0	1	0	1	0	0	0	0	0
2	250	1	0	0	0	0	0	0	0	0	0	0	0
2	260	0	0	0	0	0	0	0	0	0	0	0	0
2	270	0	0	0	0	0	0	0	0	0	0	0	0
2	280	0	0	0	0	0	0	0	0	0	0	0	0
2	290	0	0	0	0	0	0	0	0	0	0	0	0
2	300	0	0	0	0	0	0	0	0	0	0	0	0
2	310	0	0	0	0	0	0	0	0	0	0	0	0
2	320	0	0	0	0	0	0	0	0	0	0	0	0
2	330	0	0	0	0	0	0	0	0	0	0	0	0
2	340	0	0	0	0	0	0	0	0	0	0	0	0
2	350	0	0	0	0	0	0	0	0	0	0	0	0
2	360	0	0	0	0	0	0	0	0	0	0	0	0
2	370	0	0	0	0	0	0	0	0	0	0	0	0
2	380	0	0	0	0	0	0	0	0	0	0	0	0
2	390	0	0	0	0	0	0	0	0	0	0	0	0
2	400	0	0	0	0	0	0	0	0	0	0	0	0
2	410	0	0	0	0	0	0	0	0	0	0	0	0
2	420	0	0	0	0	0	0	0	0	0	0	0	0
2	430	0	0	0	0	0	0	0	0	0	0	0	0
2	440	0	0	0	0	0	0	0	0	0	0	0	0

Table G.4: Blue marlin - region 3: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-CN		LL-FJ		LL-AU		LL-TO	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
3	40	0	5	0	3	0	1	0	1
3	50	0	5	0	3	0	1	0	1
3	60	0	5	0	3	0	1	0	1
3	70	0	5	0	3	0	1	0	1
3	80	0	5	0	3	0	1	0	1
3	90	1	4	0	3	0	1	0	1
3	100	1	4	0	3	0	1	0	1
3	110	1	4	0	3	0	1	0	1
3	120	4	1	1	2	0	1	0	1
3	130	6	0	1	2	0	1	0	1
3	140	8	0	1	2	1	0	1	0
3	150	18	0	3	0	3	0	2	0
3	160	17	0	7	0	7	0	6	0
3	170	22	0	12	0	9	0	7	0
3	180	16	0	12	0	8	0	6	0
3	190	17	0	19	0	7	0	3	0
3	200	6	0	14	0	4	0	2	0
3	210	10	0	7	0	2	0	1	0
3	220	5	0	2	0	1	0	0	0
3	230	3	0	1	0	1	0	0	0
3	240	2	0	1	0	1	0	0	0
3	250	1	0	1	0	0	0	0	0
3	260	0	0	0	0	0	0	0	0
3	270	1	0	0	0	0	0	0	0
3	280	0	0	0	0	0	0	0	0
3	290	0	0	0	0	0	0	0	0
3	300	0	0	0	0	0	0	0	0
3	310	0	0	0	0	0	0	0	0
3	320	0	0	0	0	0	0	0	0
3	330	0	0	0	0	0	0	0	0

Table G.5: Blue marlin - region 4: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-PF		LL-CN		LL-TWOS	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
4	40	0	5	0	3	0	2
4	50	0	5	0	3	0	2
4	60	0	5	0	3	0	2
4	70	0	5	0	3	0	2
4	80	0	5	0	3	0	2
4	90	0	5	0	3	0	2
4	100	0	5	0	3	0	2
4	110	0	5	1	2	0	2
4	120	2	3	0	3	0	2
4	130	3	2	1	2	0	2
4	140	8	0	2	1	0	2
4	150	5	0	2	1	0	2
4	160	16	0	5	0	3	0
4	170	34	0	9	0	6	0
4	180	30	0	15	0	15	0
4	190	24	0	19	0	13	0
4	200	14	0	10	0	13	0
4	210	11	0	6	0	8	0
4	220	4	0	2	0	3	0
4	230	2	0	2	0	1	0
4	240	2	0	0	0	0	0
4	250	1	0	0	0	1	0
4	260	1	0	0	0	0	0
4	270	1	0	0	0	0	0
4	280	0	0	0	0	0	0
4	290	0	0	0	0	0	0
4	300	0	0	0	0	0	0

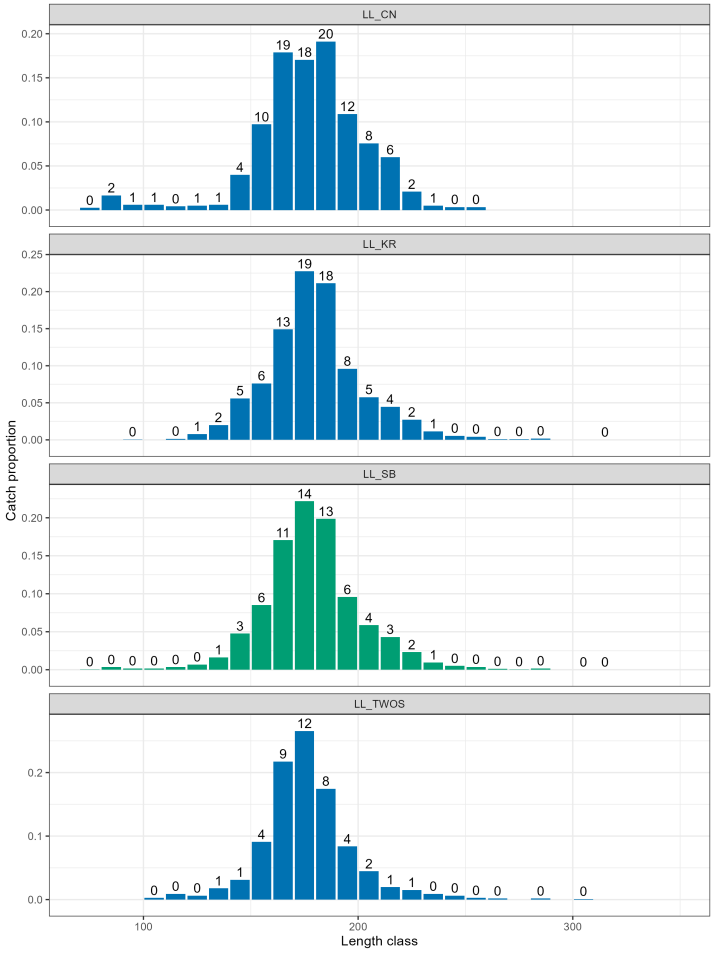


Figure G.2: The estimated length composition of blue marlin catches in region 1 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

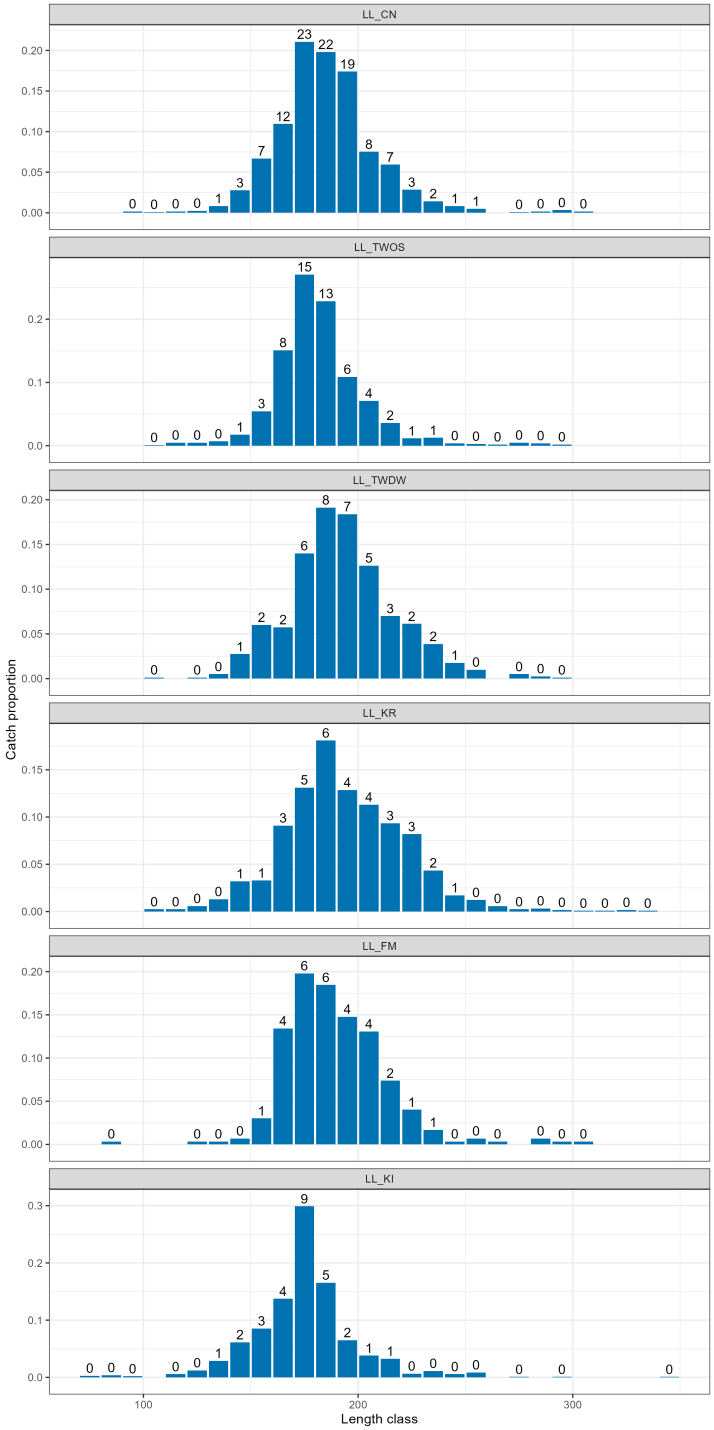


Figure G.3: The estimated length composition of blue marlin catches in region 2 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

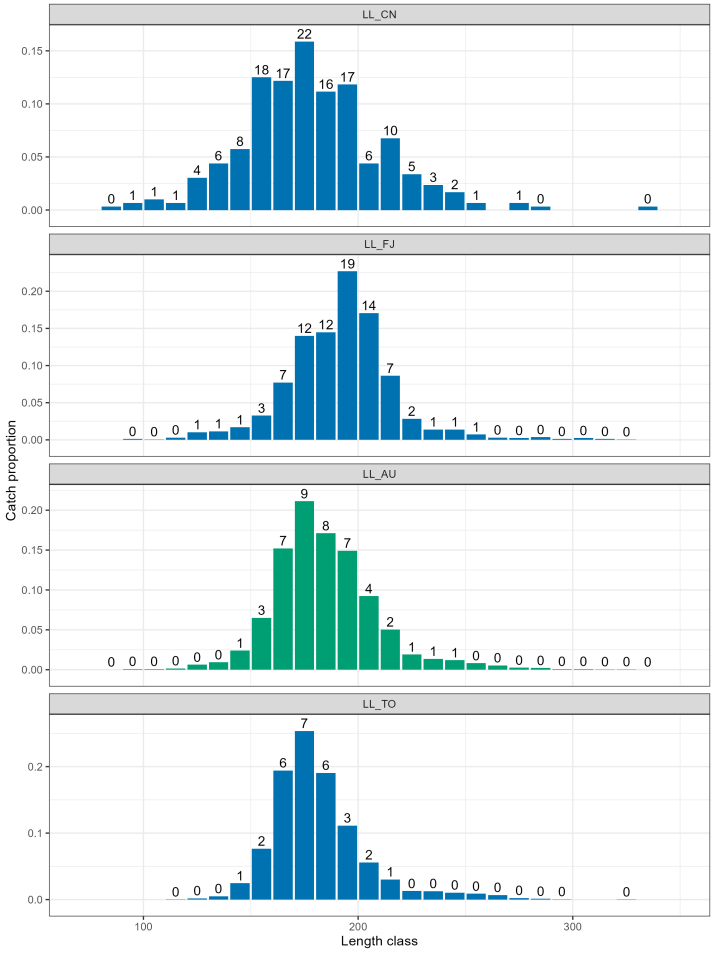


Figure G.4: The estimated length composition of blue marlin catches in region 3 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

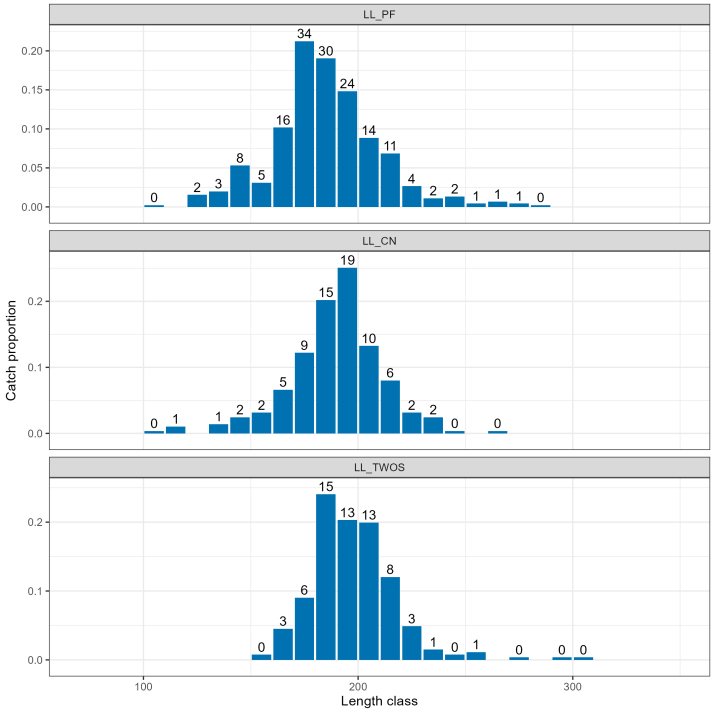


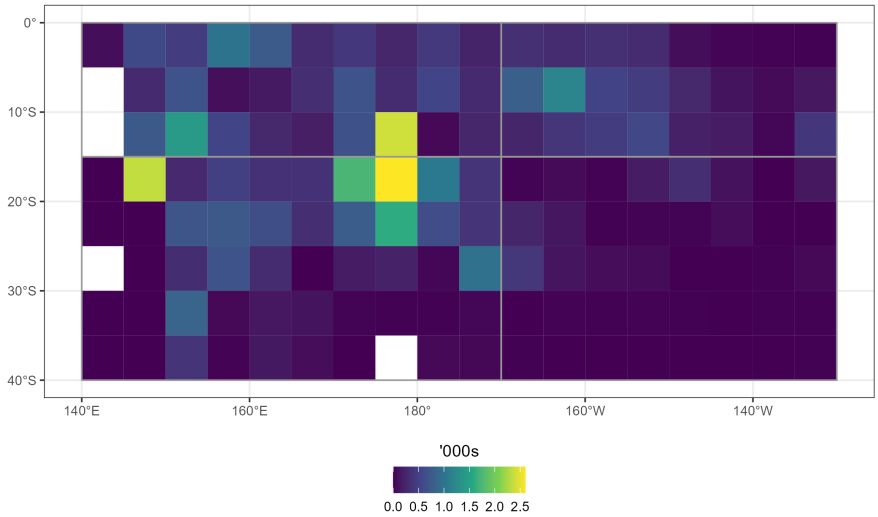
Figure G.5: The estimated length composition of blue marlin catches in region 4 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

Table G.6: Blue marlin: comparisons of target sample sizes for estimation of growth (Tar. growth, n) and maturity (Tar., mat., n) against available samples in the Pacific Marine Specimen Bank (PMSB growth and PMSB mat.), per region (Reg.).

Reg.	Tar. growth (n)	PMSB growth (n)	Tar. mat. (n)	PMSB mat. (n)
1	297	0	386	0
2	292	3	393	3
3	293	9	381	9
4	295	0	394	0

H Black marlin

(a) Total reported catch



(b) Catch from sampled fleet-region combinations

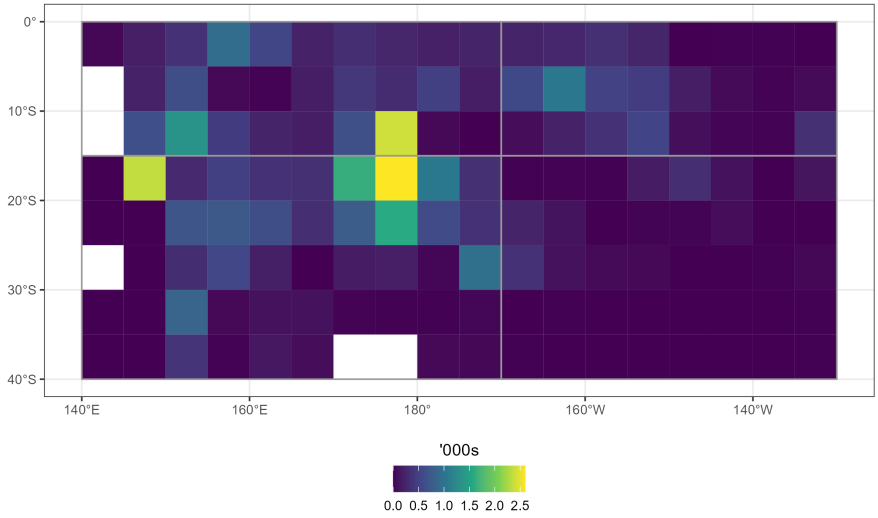


Figure H.1: Black marlin: Spatial distributions of a) total reported catches and b) reported catch from sampled fleet-region combinations from 2020–2024, with sampling as per the developed biological sampling plan.

Table H.1: Black marlin: average annual reported catch (Catch, thousands) and observed catch (Obs. catch, individuals), available length samples for estimation of length frequencies (LF samples, individuals), target biological sampling rate (Bio. samples, individuals), and maximum supplemental samples for estimation of maturity per length class (Mat. samples, individuals), per region (Reg.) and fleet (LL prefix denotes longline, see Section 2).

Region	Fleet	Catch ('000s)	Obs. catch (n)	LF samples (n)	Bio. samples (n)	Mat. samples (n)
1	LL-CN	1.2	23	104	157	5
1	LL-FJ	0.6	25	115	79	3
1	LL-KI	0.3	10	48	34	1
1	LL-JP	0.2	8	37	30	1
2	LL-CN	0.9	38	188	245	8
2	LL-KI	0.2	36	170	55	2
3	LL-FJ	1.6	54	284	128	4
3	LL-AU	1.2	0	0	92	3
3	LL-NC	0.4	27	112	30	1
3	LL-CN	0.3	15	77	26	1
3	LL-ES	0.3	2	10	23	1
4	LL-ES	0.1	0	0	127	4
4	LL-PF	0.1	8	43	117	4
4	LL-CN	0.1	8	39	56	2

Table H.2: Black marlin - region 1: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-CN		LL-FJ		LL-KI		LL-JP	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
1	60	0	5	0	3	0	1	0	1
1	70	0	5	0	3	0	1	0	1
1	80	0	5	0	3	0	1	0	1
1	90	0	5	0	3	0	1	0	1
1	100	0	5	0	3	0	1	0	1
1	110	1	4	0	3	0	1	0	1
1	120	3	2	2	1	1	0	1	0
1	130	6	0	3	0	1	0	1	0
1	140	16	0	8	0	3	0	3	0
1	150	11	0	5	0	2	0	2	0
1	160	19	0	10	0	4	0	4	0
1	170	29	0	15	0	6	0	5	0
1	180	24	0	12	0	5	0	5	0
1	190	18	0	9	0	4	0	3	0
1	200	11	0	5	0	2	0	2	0
1	210	11	0	6	0	2	0	2	0
1	220	3	2	1	2	1	0	1	0
1	230	1	4	0	3	0	1	0	1
1	240	2	3	1	2	0	1	0	1
1	250	1	4	0	3	0	1	0	1
1	260	0	5	0	3	0	1	0	1
1	270	1	0	0	0	0	0	0	0
1	280	0	0	0	0	0	0	0	0
1	290	0	0	0	0	0	0	0	0
1	300	0	0	0	0	0	0	0	0
1	310	0	0	0	0	0	0	0	0

Table H.3: Black marlin - region 2: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-CN		LL-KI	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)
2	60	0	8	0	2
2	70	0	8	0	2
2	80	1	7	0	2
2	90	1	7	0	2
2	100	1	7	0	2
2	110	1	7	0	2
2	120	11	0	3	0
2	130	14	0	3	0
2	140	14	0	3	0
2	150	20	0	4	0
2	160	40	0	9	0
2	170	28	0	6	0
2	180	41	0	9	0
2	190	34	0	7	0
2	200	9	0	2	0
2	210	11	0	3	0
2	220	5	3	1	1
2	230	1	7	0	2
2	240	3	5	1	1
2	250	2	6	0	2
2	260	1	7	0	2
2	270	2	0	0	0
2	280	1	0	0	0
2	290	1	0	0	0
2	300	1	0	0	0
2	310	0	0	0	0
2	320	2	0	0	0
2	330	0	0	0	0
2	340	0	0	0	0
2	350	1	0	0	0
2	360	1	0	0	0

Table H.4: Black marlin - region 3: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-FJ		LL-AU		LL-NC		LL-CN		LL-ES	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
3	60	0	4	0	3	0	1	0	1	0	1
3	70	0	4	0	3	0	1	0	1	0	1
3	80	0	4	0	3	0	1	0	1	0	1
3	90	0	4	0	3	0	1	0	1	0	1
3	100	0	4	0	3	0	1	0	1	0	1
3	110	1	3	1	2	0	1	0	1	0	1
3	120	1	3	1	2	0	1	0	1	0	1
3	130	1	3	1	2	0	1	0	1	0	1
3	140	4	0	3	0	1	0	1	0	1	0
3	150	8	0	5	0	2	0	2	0	1	0
3	160	11	0	8	0	3	0	2	0	2	0
3	170	14	0	10	0	3	0	3	0	3	0
3	180	14	0	10	0	3	0	3	0	3	0
3	190	17	0	12	0	4	0	4	0	3	0
3	200	15	0	11	0	4	0	3	0	3	0
3	210	13	0	9	0	3	0	3	0	2	0
3	220	7	0	5	0	2	0	1	0	1	0
3	230	3	1	2	1	1	0	1	0	1	0
3	240	4	0	3	0	1	0	1	0	1	0
3	250	3	1	2	1	1	0	1	0	1	0
3	260	4	0	3	0	1	0	1	0	1	0
3	270	2	0	2	0	1	0	0	0	0	0
3	280	2	0	2	0	1	0	0	0	0	0
3	290	2	0	1	0	0	0	0	0	0	0
3	300	1	0	1	0	0	0	0	0	0	0

Table H.5: Black marlin - region 4: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-ES		LL-PF		LL-CN	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
4	60	0	4	0	4	0	2
4	70	0	4	0	4	0	2
4	80	0	4	0	4	0	2
4	90	0	4	0	4	0	2
4	100	1	3	1	3	0	2
4	110	0	4	0	4	0	2
4	120	1	3	1	3	0	2
4	130	0	4	0	4	0	2
4	140	1	3	1	3	0	2
4	150	4	0	4	0	2	0
4	160	8	0	8	0	4	0
4	170	6	0	6	0	3	0
4	180	14	0	13	0	6	0
4	190	18	0	16	0	8	0
4	200	15	0	14	0	6	0
4	210	24	0	22	0	11	0
4	220	6	0	6	0	3	0
4	230	5	0	5	0	2	0
4	240	8	0	8	0	4	0
4	250	3	1	3	1	1	1
4	260	4	0	4	0	2	0
4	270	5	0	5	0	2	0
4	280	1	0	1	0	0	0
4	290	1	0	1	0	0	0

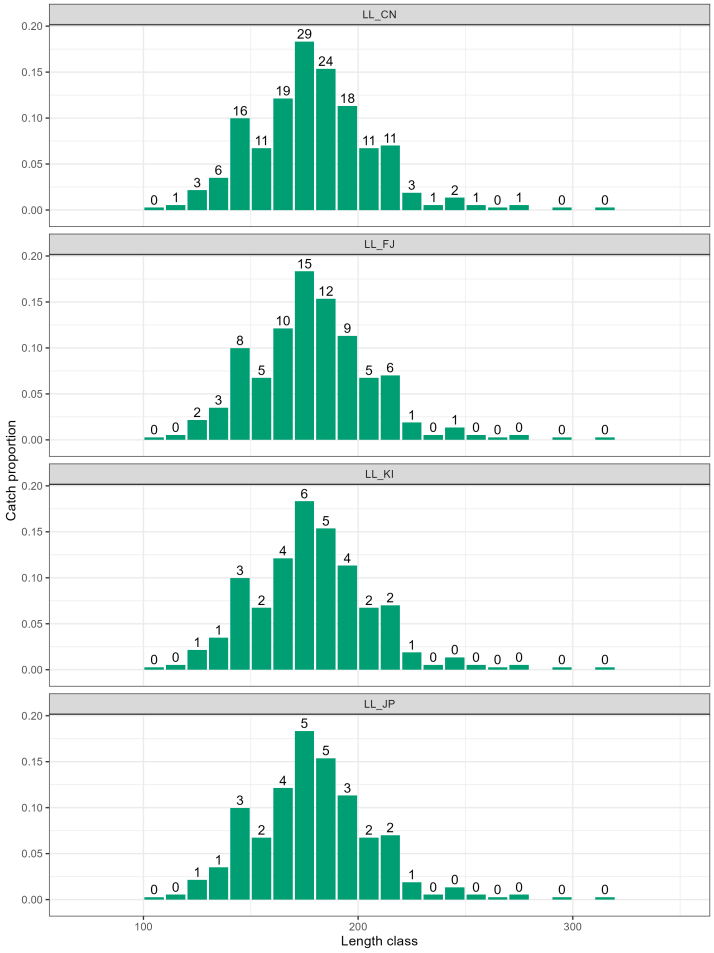


Figure H.2: The estimated length composition of black marlin catches in region 1 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

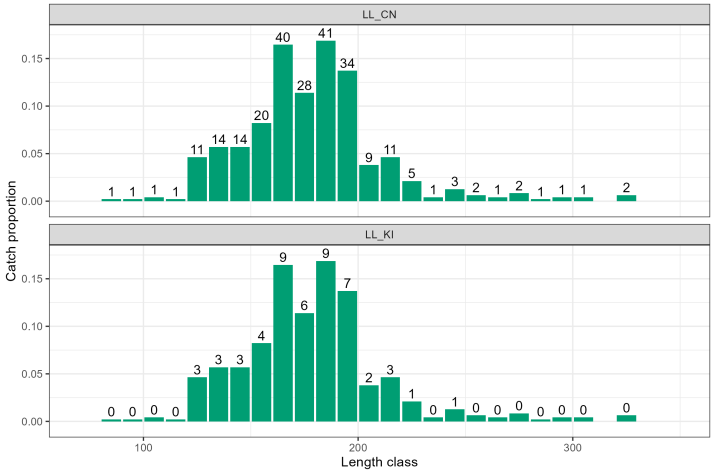


Figure H.3: The estimated length composition of black marlin catches in region 2 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

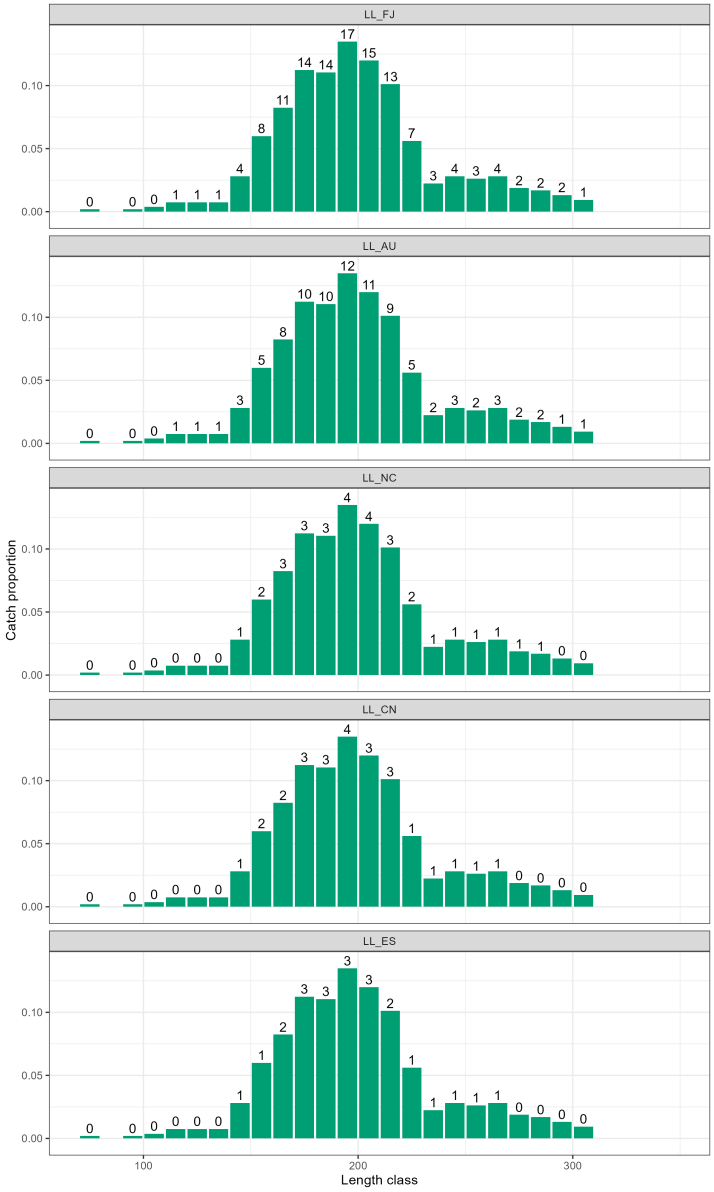


Figure H.4: The estimated length composition of black marlin catches in region 3 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

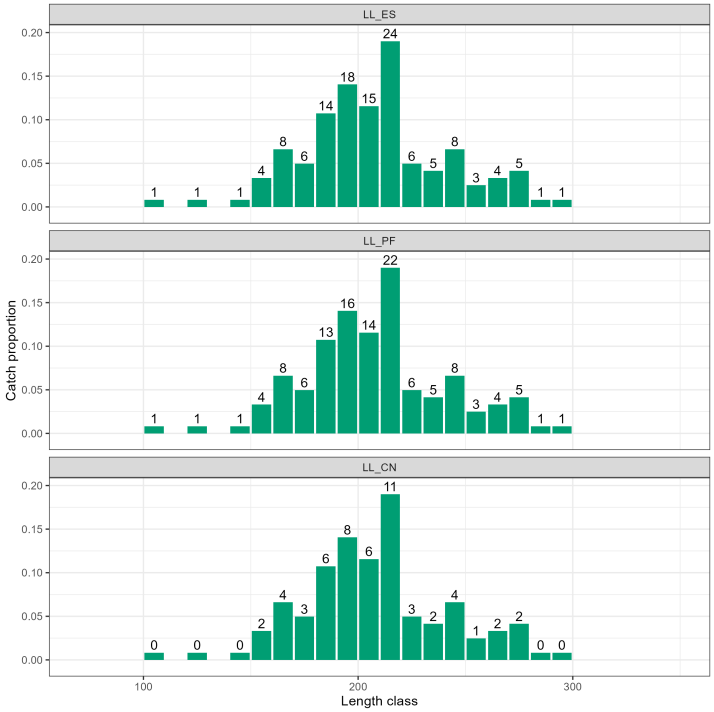


Figure H.5: The estimated length composition of black marlin catches in region 4 per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

Table H.6: Black marlin: comparisons of target sample sizes for estimation of growth (Tar. growth, n) and maturity (Tar., mat., n) against available samples in the Pacific Marine Specimen Bank (PMSB growth and PMSB mat.), per region (Reg.).

Reg.	Tar. growth (n)	PMSB growth (n)	Tar. mat. (n)	PMSB mat. (n)
1	294	0	395	0
2	298	0	390	0
3	299	9	377	9
4	298	0	385	0

I Blue shark

Table I.1: Blue shark: average annual reported catch (Catch, thousands) and observed catch (Obs. catch, individuals), available length samples for estimation of length frequencies (LF samples, individuals), target biological sampling rate (Bio. samples, individuals), and maximum supplemental samples for estimation of maturity per length class (Mat. samples, individuals), per region (Reg.) and fleet (LL prefix denotes longline, see Section 2).

Region	Fleet	Catch ('000s)	Obs. catch (n)	LF samples (n)	Bio. samples (n)	Mat. samples (n)
1-A	LL-TW	0.98	50	340	110	4
1-A	LL-SB	0.48	1	28	54	2
1-A	LL-CN	0.45	12	98	51	2
1-A	LL-KR	0.41	20	265	46	2
1-A	LL-JP	0.34	5	6	38	1
1-B	LL-TW	6.89	732	5852	115	4
1-B	LL-CN	4.91	237	2249	82	3
1-B	LL-KR	3.50	212	537	58	2
1-B	LL-VU	2.70	6	1023	45	1
2-A	LL-NC	9.49	489	156	148	5
2-A	LL-CN	4.14	111	38	65	2
2-A	LL-FJ	3.80	0	1	59	2
2-A	LL-AU	1.81	0	359	28	1
2-B	LL-FJ	21.75	1963	1353	125	4
2-B	LL-TW	12.91	1170	9682	74	2
2-B	LL-CN	12.07	349	1322	69	2
2-B	LL-PF	5.47	215	51	31	1
3-A	LL-NZ	4.77	805	11146	90	3
3-A	LL-AU	4.37	0	1777	83	3
3-A	LL-JP	3.80	1426	33	72	2
3-A	LL-TW	2.91	307	3546	55	2
3-B	LL-NZ	30.34	1739	7488	223	7
3-B	LL-TW	6.80	813	6325	50	2
3-B	LL-VU	3.63	96	1379	27	1

Table I.2: Blue shark - region 1-A: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-TW		LL-SB		LL-CN		LL-KR		LL-JP	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
1-A	40	0	4	0	2	0	2	0	2	0	1
1-A	50	0	4	0	2	0	2	0	2	0	1
1-A	60	1	3	0	2	0	2	0	2	0	1
1-A	70	1	3	0	2	0	2	0	2	0	1
1-A	80	0	4	0	2	0	2	0	2	0	1
1-A	90	0	4	1	1	1	1	0	2	0	1
1-A	100	0	4	1	1	1	1	1	1	1	0
1-A	110	0	4	0	2	0	2	0	2	0	1
1-A	120	0	4	1	1	1	1	1	1	1	0
1-A	130	1	3	0	2	0	2	0	2	0	1
1-A	140	4	0	2	0	2	0	1	1	1	0
1-A	150	10	0	4	0	4	0	2	0	3	0
1-A	160	16	0	7	0	6	0	5	0	5	0
1-A	170	14	0	7	0	7	0	7	0	5	0
1-A	180	18	0	10	0	9	0	9	0	7	0
1-A	190	20	0	8	0	8	0	7	0	6	0
1-A	200	10	0	6	0	6	0	6	0	4	0
1-A	210	5	0	3	0	3	0	3	0	2	0
1-A	220	4	0	2	0	2	0	2	0	1	0
1-A	230	2	0	1	0	1	0	1	0	1	0
1-A	240	2	0	1	0	1	0	0	0	0	0
1-A	250	0	0	0	0	0	0	0	0	0	0
1-A	260	1	0	0	0	0	0	0	0	0	0
1-A	270	0	0	0	0	0	0	0	0	0	0
1-A	280	0	0	0	0	0	0	0	0	0	0
1-A	290	0	0	0	0	0	0	0	0	0	0
1-A	300	0	0	0	0	0	0	0	0	0	0

Table I.3: Blue shark - region 1-B: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-TW		LL-CN		LL-KR		LL-VU	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
1-B	40	0	4	0	3	0	2	0	1
1-B	50	0	4	0	3	0	2	0	1
1-B	60	0	4	0	3	0	2	0	1
1-B	70	0	4	0	3	0	2	0	1
1-B	80	0	4	0	3	0	2	0	1
1-B	90	0	4	0	3	0	2	0	1
1-B	100	0	4	0	3	0	2	0	1
1-B	110	0	4	0	3	0	2	1	0
1-B	120	0	4	0	3	1	1	2	0
1-B	130	0	4	0	3	2	0	3	0
1-B	140	1	3	1	2	2	0	2	0
1-B	150	2	2	2	1	4	0	1	0
1-B	160	8	0	5	0	7	0	3	0
1-B	170	17	0	12	0	8	0	5	0
1-B	180	25	0	19	0	11	0	9	0
1-B	190	24	0	16	0	6	0	8	0
1-B	200	16	0	13	0	6	0	7	0
1-B	210	12	0	5	0	5	0	3	0
1-B	220	5	0	3	0	3	0	1	0
1-B	230	2	0	2	0	1	0	0	0
1-B	240	1	0	1	0	0	0	0	0
1-B	250	0	0	1	0	0	0	0	0
1-B	260	0	0	0	0	0	0	0	0
1-B	270	0	0	0	0	1	0	0	0
1-B	280	0	0	0	0	0	0	0	0
1-B	290	0	0	0	0	0	0	0	0
1-B	300	0	0	0	0	0	0	0	0
1-B	310	0	0	0	0	0	0	0	0
1-B	320	0	0	0	0	0	0	0	0

Table I.4: Blue shark - region 2-A: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-NC		LL-CN		LL-FJ		LL-AU	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
2-A	40	0	5	0	2	0	2	0	1
2-A	50	0	5	0	2	0	2	0	1
2-A	60	0	5	0	2	0	2	0	1
2-A	70	1	4	0	2	0	2	0	1
2-A	80	2	3	0	2	0	2	0	1
2-A	90	2	3	1	1	1	1	0	1
2-A	100	3	2	1	1	1	1	0	1
2-A	110	1	4	1	1	1	1	0	1
2-A	120	4	1	1	1	1	1	1	0
2-A	130	2	3	2	0	2	0	1	0
2-A	140	4	1	2	0	2	0	1	0
2-A	150	0	5	2	0	2	0	1	0
2-A	160	3	2	4	0	4	0	2	0
2-A	170	4	1	6	0	6	0	3	0
2-A	180	8	0	7	0	6	0	3	0
2-A	190	14	0	7	0	7	0	3	0
2-A	200	27	0	9	0	8	0	4	0
2-A	210	14	0	7	0	6	0	3	0
2-A	220	7	0	3	0	2	0	1	0
2-A	230	12	0	3	0	3	0	1	0
2-A	240	9	0	2	0	2	0	1	0
2-A	250	8	0	2	0	2	0	1	0
2-A	260	5	0	1	0	1	0	0	0
2-A	270	7	0	1	0	1	0	0	0
2-A	280	6	0	1	0	1	0	0	0
2-A	290	5	0	0	0	0	0	0	0
2-A	300	1	0	1	0	1	0	0	0
2-A	310	1	0	0	0	0	0	0	0
2-A	320	0	0	0	0	0	0	0	0
2-A	330	0	0	0	0	0	0	0	0
2-A	340	0	0	0	0	0	0	0	0
2-A	350	0	0	0	0	0	0	0	0
2-A	360	0	0	0	0	0	0	0	0
2-A	370	1	0	0	0	0	0	0	0
2-A	380	0	0	0	0	0	0	0	0
2-A	390	1	0	0	0	0	0	0	0
2-A	400	0	0	0	0	0	0	0	0

Table I.5: Blue shark - region 2-B: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-FJ		LL-TW		LL-CN		LL-PF	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
2-B	40	0	4	0	2	0	2	0	1
2-B	50	0	4	0	2	0	2	0	1
2-B	60	0	4	0	2	0	2	0	1
2-B	70	0	4	0	2	0	2	0	1
2-B	80	0	4	0	2	0	2	0	1
2-B	90	1	3	0	2	0	2	0	1
2-B	100	1	3	0	2	1	1	0	1
2-B	110	1	3	0	2	0	2	0	1
2-B	120	2	2	1	1	1	1	0	1
2-B	130	3	1	1	1	2	0	0	1
2-B	140	4	0	1	1	1	1	1	0
2-B	150	6	0	3	0	3	0	1	0
2-B	160	12	0	6	0	3	0	2	0
2-B	170	15	0	9	0	7	0	4	0
2-B	180	21	0	12	0	13	0	5	0
2-B	190	22	0	13	0	16	0	6	0
2-B	200	12	0	10	0	12	0	4	0
2-B	210	12	0	9	0	4	0	3	0
2-B	220	4	0	6	0	2	0	2	0
2-B	230	3	0	2	0	1	0	1	0
2-B	240	2	0	1	0	1	0	0	0
2-B	250	1	0	1	0	0	0	0	0
2-B	260	0	0	0	0	0	0	0	0
2-B	270	0	0	0	0	0	0	0	0
2-B	280	1	0	0	0	0	0	0	0
2-B	290	0	0	0	0	0	0	0	0
2-B	300	0	0	0	0	0	0	0	0
2-B	310	0	0	0	0	0	0	0	0
2-B	320	0	0	0	0	0	0	0	0
2-B	330	0	0	0	0	0	0	0	0
2-B	340	0	0	0	0	0	0	0	0
2-B	350	0	0	0	0	0	0	0	0
2-B	360	0	0	0	0	0	0	0	0
2-B	370	0	0	0	0	0	0	0	0
2-B	380	0	0	0	0	0	0	0	0
2-B	390	0	0	0	0	0	0	0	0
2-B	400	0	0	0	0	0	0	0	0
2-B	410	0	0	0	0	0	0	0	0

Table I.6: Blue shark - region 3-A: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-NZ		LL-AU		LL-JP		LL-TW	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
3-A	40	0	3	0	3	0	2	0	2
3-A	50	0	3	0	3	0	2	0	2
3-A	60	2	1	2	1	0	2	0	2
3-A	70	3	0	3	0	0	2	0	2
3-A	80	10	0	9	0	0	2	0	2
3-A	90	11	0	10	0	0	2	0	2
3-A	100	9	0	8	0	0	2	0	2
3-A	110	7	0	6	0	0	2	0	2
3-A	120	7	0	6	0	0	2	0	2
3-A	130	6	0	6	0	2	0	1	1
3-A	140	7	0	6	0	2	0	2	0
3-A	150	7	0	6	0	2	0	1	1
3-A	160	8	0	8	0	3	0	2	0
3-A	170	7	0	6	0	5	0	4	0
3-A	180	4	0	4	0	5	0	4	0
3-A	190	1	0	1	0	5	0	4	0
3-A	200	0	0	0	0	8	0	6	0
3-A	210	0	0	0	0	11	0	9	0
3-A	220	0	0	0	0	11	0	8	0
3-A	230	0	0	0	0	6	0	5	0
3-A	240	0	0	0	0	6	0	4	0
3-A	250	0	0	0	0	4	0	3	0
3-A	260	0	0	0	0	1	0	1	0
3-A	270	0	0	0	0	1	0	1	0
3-A	280	0	0	0	0	0	0	0	0
3-A	290	0	0	0	0	0	0	0	0
3-A	300	0	0	0	0	0	0	0	0
3-A	310	0	0	0	0	0	0	0	0

Table I.7: Blue shark - region 3-B: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-NZ		LL-TW		LL-VU	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
3-B	40	1	6	0	2	0	1
3-B	50	3	4	0	2	0	1
3-B	60	8	0	0	2	0	1
3-B	70	10	0	0	2	0	1
3-B	80	19	0	0	2	0	1
3-B	90	16	0	0	2	0	1
3-B	100	17	0	0	2	0	1
3-B	110	18	0	0	2	0	1
3-B	120	23	0	0	2	0	1
3-B	130	20	0	0	2	0	1
3-B	140	17	0	1	1	0	1
3-B	150	18	0	1	1	1	0
3-B	160	13	0	3	0	1	0
3-B	170	10	0	6	0	2	0
3-B	180	9	0	9	0	4	0
3-B	190	6	0	9	0	3	0
3-B	200	6	0	6	0	5	0
3-B	210	3	0	6	0	4	0
3-B	220	2	0	4	0	2	0
3-B	230	1	0	2	0	1	0
3-B	240	1	0	1	0	1	0
3-B	250	1	0	0	0	0	0
3-B	260	0	0	0	0	0	0
3-B	270	0	0	0	0	0	0
3-B	280	0	0	0	0	0	0
3-B	290	0	0	0	0	0	0
3-B	300	0	0	0	0	0	0
3-B	310	0	0	0	0	0	0
3-B	320	0	0	0	0	0	0
3-B	330	0	0	0	0	0	0
3-B	340	0	0	0	0	0	0
3-B	350	0	0	0	0	0	0
3-B	360	0	0	0	0	0	0

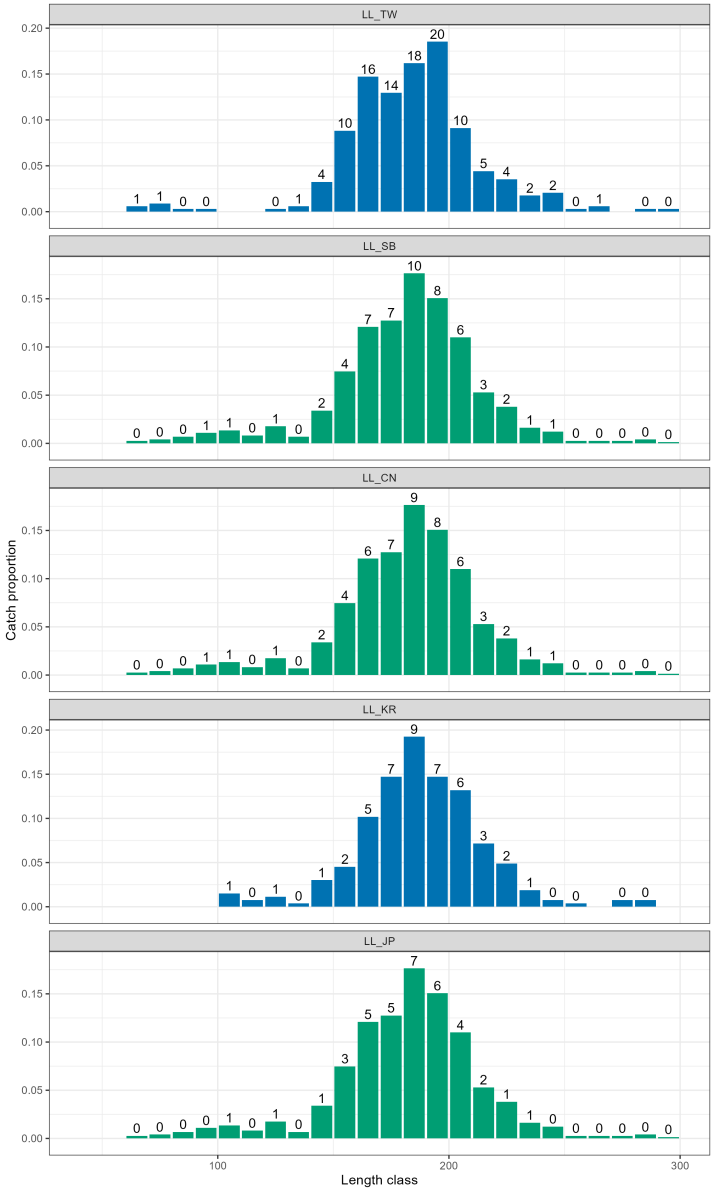


Figure I.1: The estimated length composition of blue shark catches in region 1-A per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

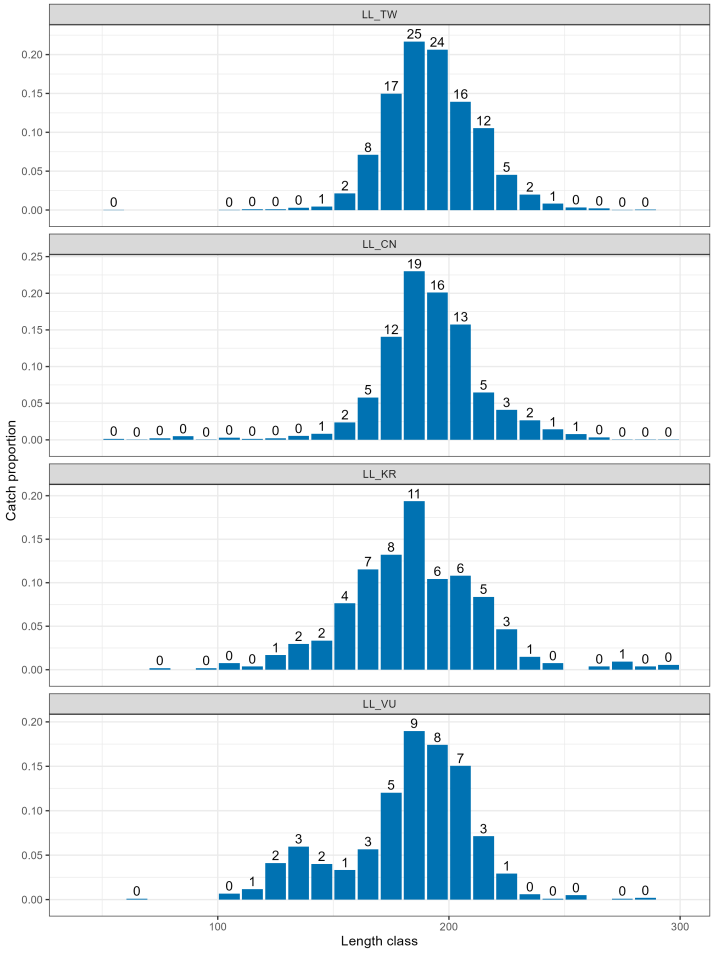


Figure I.2: The estimated length composition of blue shark catches in region 1-B per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

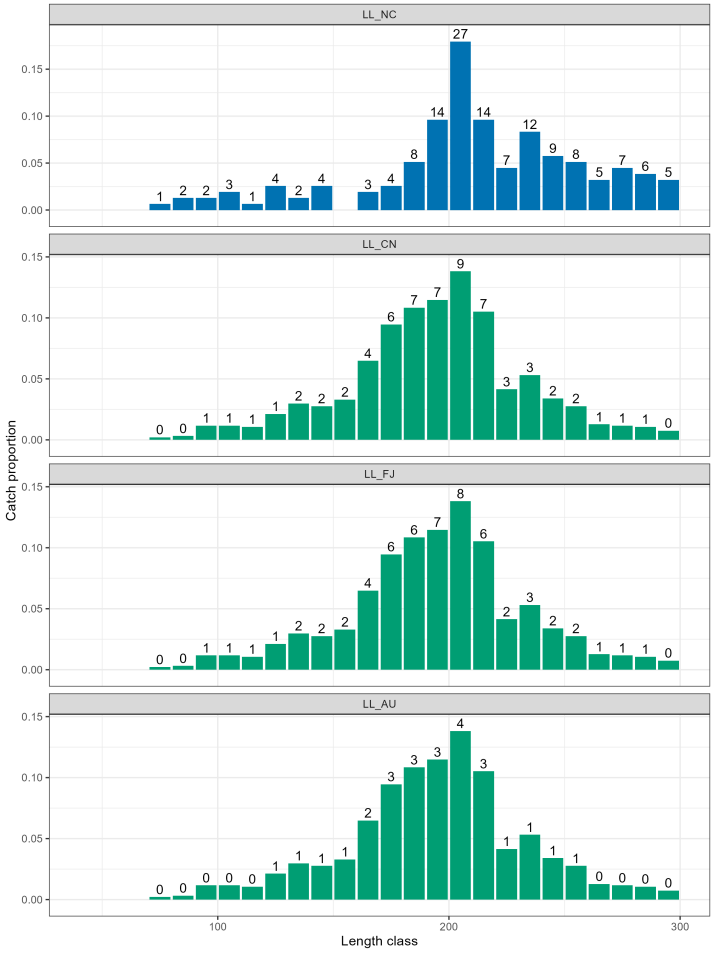


Figure I.3: The estimated length composition of blue shark catches in region 2-A per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

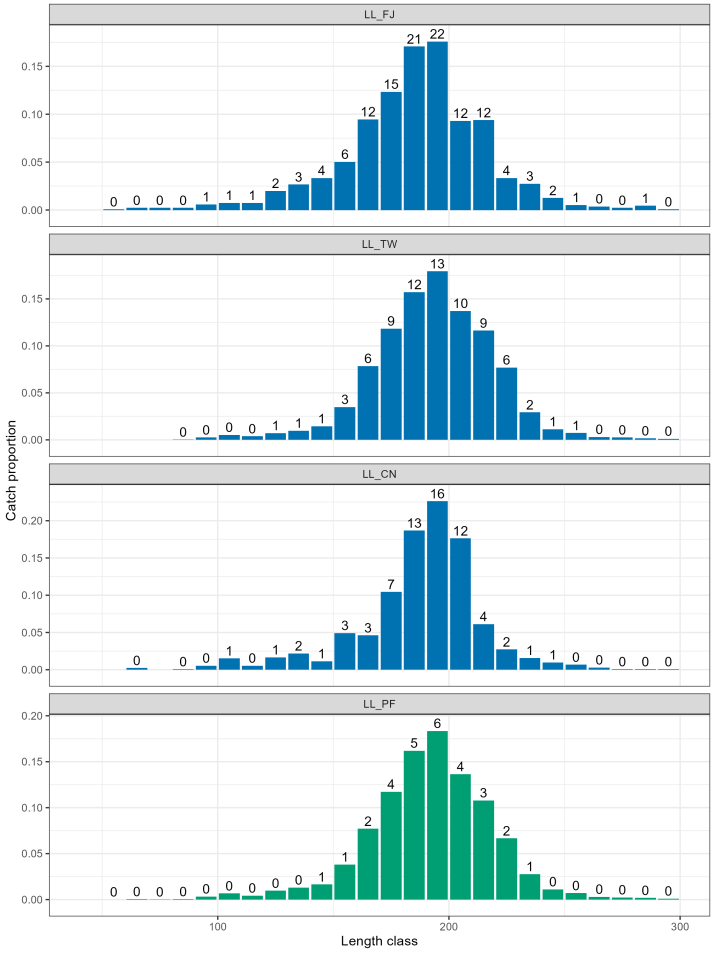


Figure I.4: The estimated length composition of blue shark catches in region 2-B per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

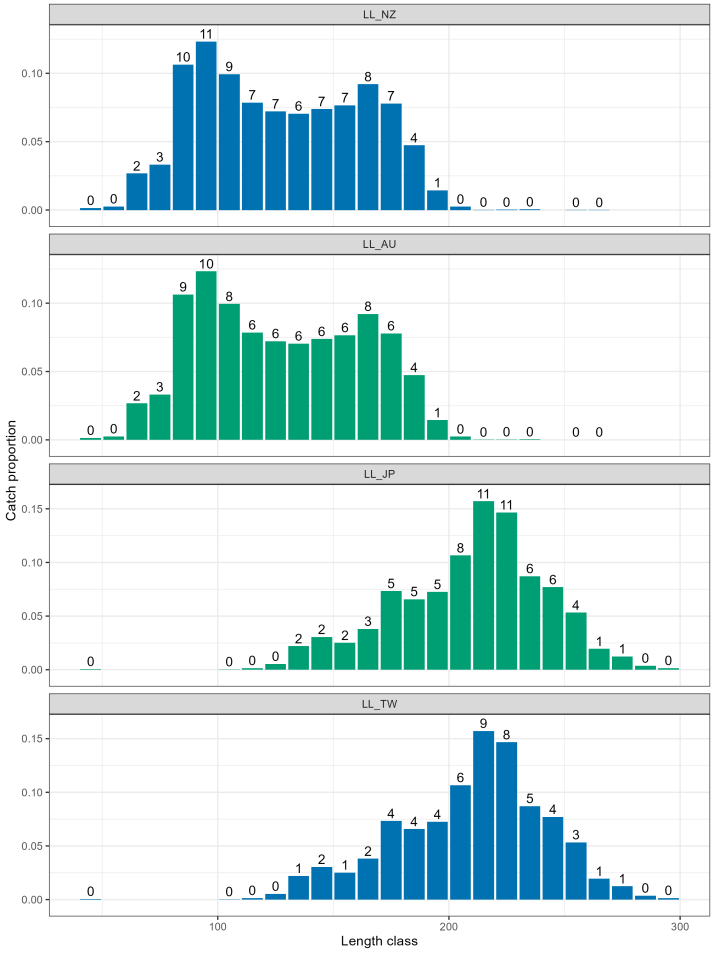


Figure I.5: The estimated length composition of blue shark catches in region 3-A per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

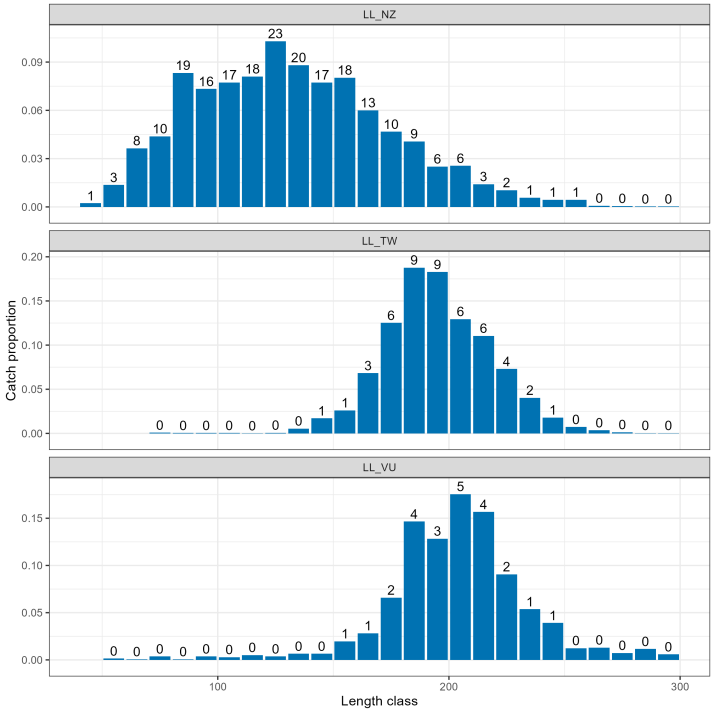


Figure I.6: The estimated length composition of blue shark catches in region 3-B per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

Table I.8: Blue shark: comparisons of target sample sizes for estimation of growth (Tar. growth, n) and maturity (Tar., mat., n) against available samples in the Pacific Marine Specimen Bank (PMSB growth and PMSB mat.), per region (Reg.).

Reg.	Tar. growth (n)	PMSB growth (n)	Tar. mat. (n)	PMSB mat. (n)
1-A	297	0	395	0
1-B	295	0	397	0
2-A	302	0	382	0
2-B	294	0	372	0
3-A	297	0	349	0
3-B	294	0	337	0

J Silky shark

Table J.1: Silky shark: average annual reported catch (Catch, thousands) and observed catch (Obs. catch, individuals), available length samples for estimation of length frequencies (LF samples, individuals), target biological sampling rate (Bio. samples, individuals), and maximum supplemental samples for estimation of maturity per length class (Mat. samples, individuals), per region (Reg.) and fleet (LL prefix denotes longline, FS prefix denotes purse seine fishing on free-schools, ASS prefix denotes purse seine fishing on associated schools, see Section 2).

Region	Fleet	Catch ('000s)	Obs. catch (n)	LF samples (n)	Bio. samples (n)	Mat. samples (n)
1-A	LL-TW	3.50	221	791	145	5
1-A	LL-FM	1.43	62	42	60	2
1-A	LL-KI	1.35	0	0	56	2
1-A	LL-JP	0.94	46	48	39	1
1-B	LL-KR	5.68	304	503	174	6
1-B	LL-TW	1.76	128	473	54	2
1-B	LL-CN	1.27	1	449	39	1
1-B	LL-US	1.10	175	82	34	1
1-W	LL-TW	1.42	1	73	156	5
1-W	LL-PW	1.32	0	0	144	5
2-A	LL-TW	9.02	172	14016	133	4
2-A	ASS-SB	6.24	3168	4420	92	3
2-A	FS-PG	5.07	9554	12842	75	2
2-B	LL-KR	5.41	136	822	125	4
2-B	LL-TW	2.65	265	2071	61	2
2-B	LL-CN	2.48	48	994	57	2
2-B	LL-FJ	2.45	349	727	57	2

Table J.2: Silky shark - region 1-A: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-TW		LL-FM		LL-KI		LL-JP	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
1-A	30	0	5	0	2	0	2	0	1
1-A	40	0	5	0	2	0	2	0	1
1-A	50	2	3	1	1	1	1	0	1
1-A	60	6	0	2	0	2	0	2	0
1-A	70	11	0	4	0	4	0	3	0
1-A	80	14	0	6	0	6	0	4	0
1-A	90	13	0	5	0	5	0	3	0
1-A	100	20	0	8	0	7	0	5	0
1-A	110	18	0	7	0	7	0	5	0
1-A	120	20	0	8	0	8	0	5	0
1-A	130	16	0	7	0	6	0	4	0
1-A	140	8	0	3	0	3	0	2	0
1-A	150	4	0	2	0	2	0	1	0
1-A	160	6	0	2	0	2	0	1	0
1-A	170	3	0	1	0	1	0	1	0
1-A	180	3	0	1	0	1	0	1	0
1-A	190	1	0	0	0	0	0	0	0
1-A	200	1	0	0	0	0	0	0	0
1-A	210	1	0	0	0	0	0	0	0

Table J.3: Silky shark - region 1-B: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-KR		LL-TW		LL-CN		LL-US	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
1-B	30	0	6	0	2	0	1	0	1
1-B	40	1	5	0	2	0	1	0	1
1-B	50	0	6	0	2	0	1	1	0
1-B	60	1	5	1	1	1	0	2	0
1-B	70	2	4	2	0	1	0	2	0
1-B	80	4	2	3	0	1	0	5	0
1-B	90	7	0	2	0	1	0	6	0
1-B	100	15	0	2	0	2	0	2	0
1-B	110	22	0	4	0	3	0	3	0
1-B	120	18	0	6	0	5	0	2	0
1-B	130	23	0	8	0	6	0	1	0
1-B	140	26	0	7	0	7	0	2	0
1-B	150	19	0	6	0	4	0	2	0
1-B	160	14	0	5	0	4	0	2	0
1-B	170	7	0	3	0	3	0	1	0
1-B	180	10	0	1	0	2	0	0	0
1-B	190	2	0	2	0	0	0	0	0
1-B	200	2	0	1	0	0	0	0	0
1-B	210	0	0	0	0	0	0	0	0
1-B	220	1	0	0	0	0	0	0	0
1-B	230	0	0	0	0	0	0	0	0
1-B	240	0	0	0	0	0	0	0	0
1-B	250	0	0	0	0	0	0	0	0
1-B	260	0	0	0	0	0	0	0	0
1-B	270	0	0	0	0	0	0	0	0

Table J.4: Silky shark - region 1-W: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-TW		LL-PW	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)
1-W	30	0	5	0	5
1-W	40	0	5	0	5
1-W	50	2	3	2	3
1-W	60	6	0	6	0
1-W	70	9	0	9	0
1-W	80	14	0	13	0
1-W	90	17	0	16	0
1-W	100	26	0	24	0
1-W	110	23	0	22	0
1-W	120	21	0	19	0
1-W	130	12	0	11	0
1-W	140	7	0	7	0
1-W	150	4	0	4	0
1-W	160	5	0	5	0
1-W	170	3	0	3	0
1-W	180	2	0	2	0
1-W	190	1	0	1	0
1-W	200	0	0	0	0
1-W	210	0	0	0	0

Table J.5: Silky shark - region 2-A: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, FS prefix denotes purse seine fishing on free-schools, ASS prefix denotes purse seine fishing on associated schools, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-TW		ASS-SB		FS-PG	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
2-A	30	0	4	0	3	0	2
2-A	40	0	4	0	3	0	2
2-A	50	1	3	2	1	0	2
2-A	60	3	1	6	0	1	1
2-A	70	7	0	10	0	2	0
2-A	80	10	0	14	0	2	0
2-A	90	12	0	17	0	3	0
2-A	100	18	0	11	0	5	0
2-A	110	22	0	6	0	6	0
2-A	120	18	0	5	0	7	0
2-A	130	12	0	2	1	7	0
2-A	140	7	0	3	0	6	0
2-A	150	4	0	3	0	7	0
2-A	160	5	0	3	0	8	0
2-A	170	5	0	3	0	8	0
2-A	180	5	0	3	0	7	0
2-A	190	2	0	2	0	3	0
2-A	200	1	0	1	0	2	0
2-A	210	0	0	0	0	1	0
2-A	220	0	0	0	0	0	0
2-A	230	0	0	0	0	0	0
2-A	240	0	0	0	0	0	0
2-A	250	0	0	0	0	0	0
2-A	260	0	0	0	0	0	0
2-A	270	0	0	0	0	0	0
2-A	280	0	0	0	0	0	0
2-A	290	0	0	0	0	0	0
2-A	300	0	0	0	0	0	0
2-A	310	0	0	0	0	0	0
2-A	320	0	0	0	0	0	0
2-A	330	0	0	0	0	0	0
2-A	340	0	0	0	0	0	0
2-A	350	0	0	0	0	0	0

Table J.6: Silky shark - region 2-B: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-KR		LL-TW		LL-CN		LL-FJ	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
2-B	30	0	4	0	2	0	2	0	2
2-B	40	2	2	0	2	0	2	0	2
2-B	50	2	2	0	2	0	2	2	0
2-B	60	2	2	0	2	1	1	4	0
2-B	70	5	0	1	1	3	0	6	0
2-B	80	8	0	2	0	5	0	4	0
2-B	90	13	0	1	1	6	0	4	0
2-B	100	20	0	2	0	5	0	3	0
2-B	110	19	0	2	0	3	0	3	0
2-B	120	18	0	3	0	5	0	4	0
2-B	130	10	0	4	0	4	0	4	0
2-B	140	7	0	6	0	5	0	3	0
2-B	150	5	0	8	0	6	0	2	0
2-B	160	6	0	9	0	4	0	4	0
2-B	170	2	0	8	0	4	0	5	0
2-B	180	4	0	7	0	4	0	3	0
2-B	190	0	0	5	0	2	0	2	0
2-B	200	1	0	2	0	1	0	0	0
2-B	210	0	0	1	0	0	0	1	0
2-B	220	1	0	0	0	0	0	0	0
2-B	230	0	0	0	0	0	0	0	0
2-B	240	0	0	0	0	0	0	0	0
2-B	250	0	0	0	0	0	0	0	0
2-B	260	0	0	0	0	0	0	0	0
2-B	270	0	0	0	0	0	0	0	0
2-B	280	0	0	0	0	0	0	0	0

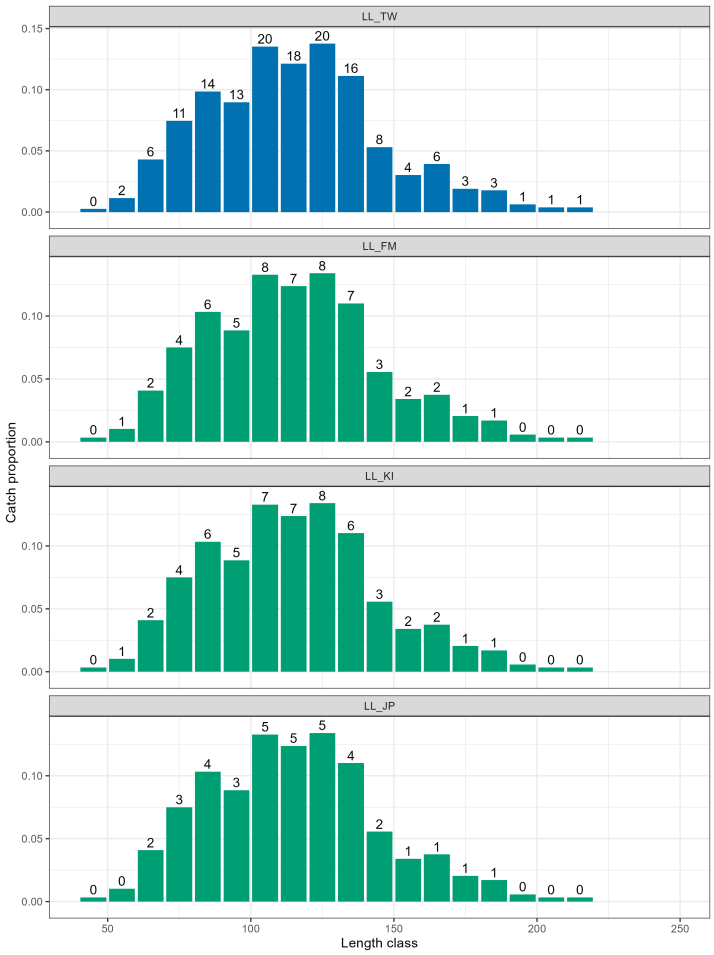


Figure J.1: The estimated length composition of silky shark catches in region 1-A per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

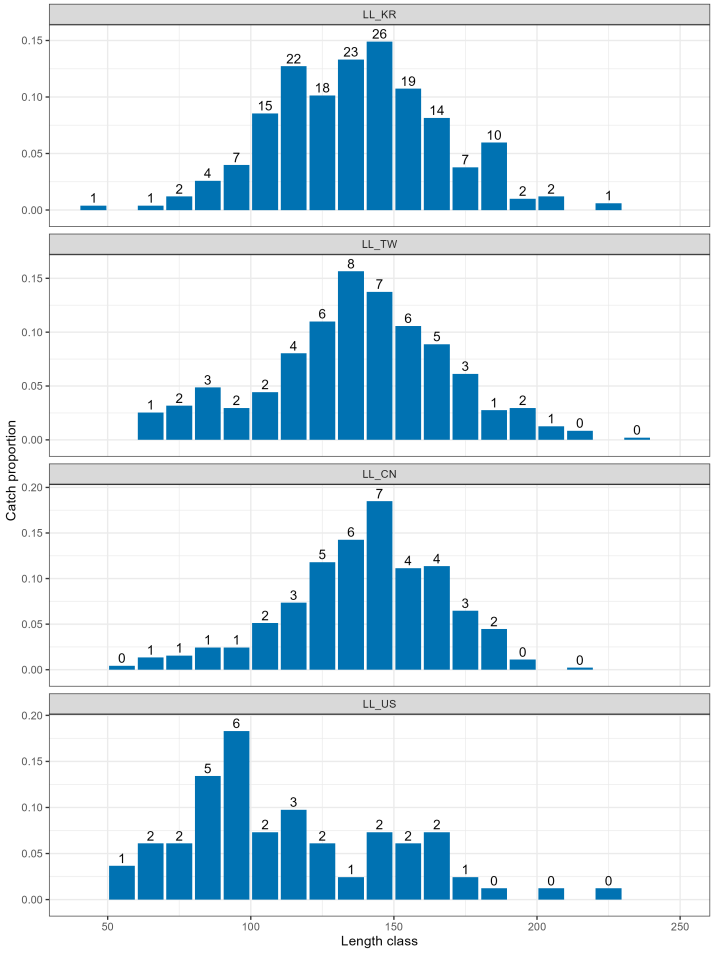


Figure J.2: The estimated length composition of silky shark catches in region 1-B per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

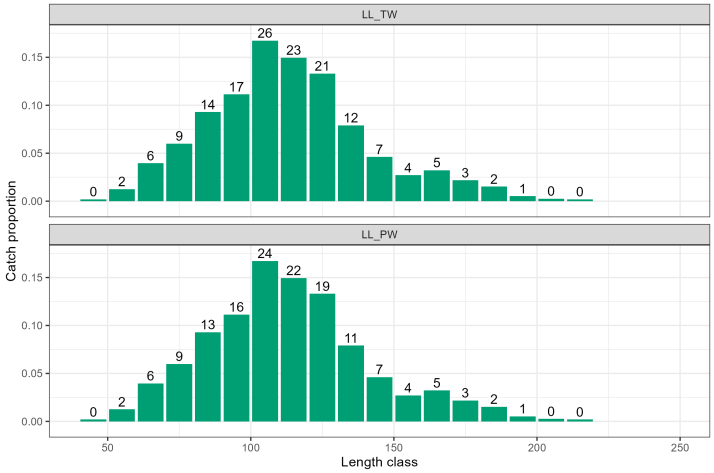


Figure J.3: The estimated length composition of silky shark catches in region 1-W per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

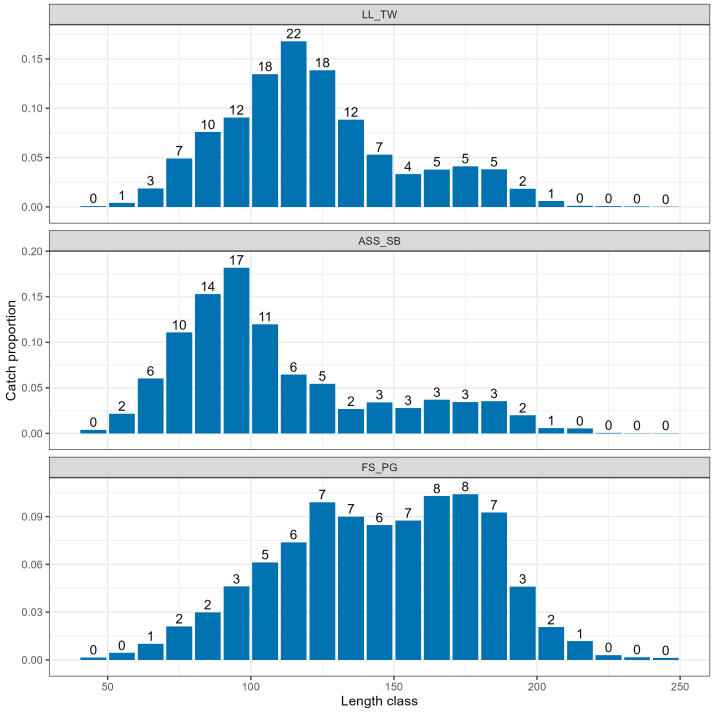


Figure J.4: The estimated length composition of silky shark catches in region 2-A per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

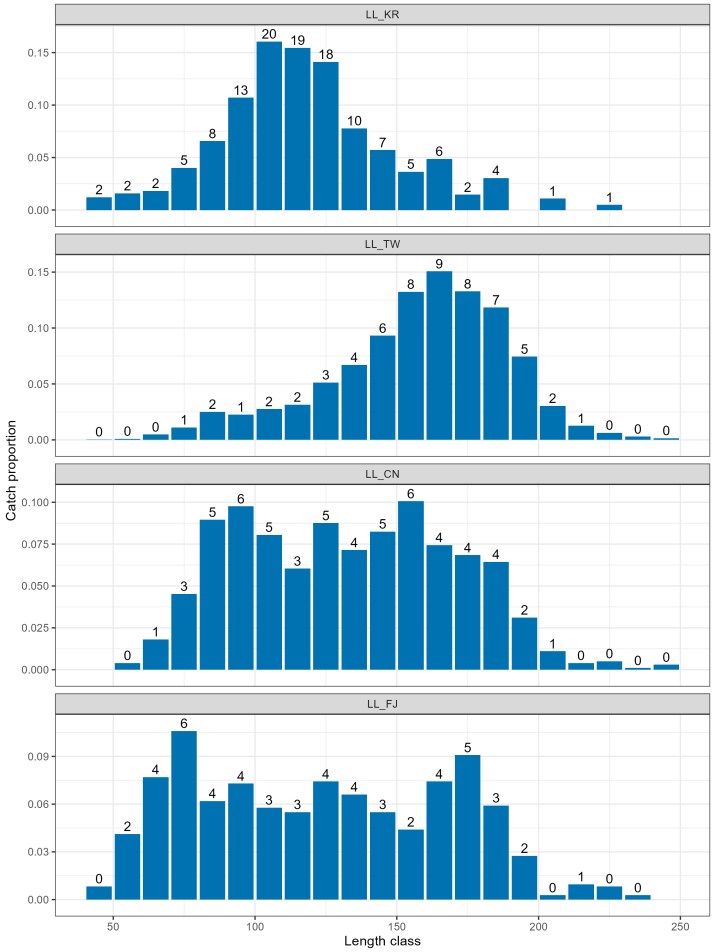


Figure J.5: The estimated length composition of silky shark catches in region 2-B per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

Table J.7: Silky shark: comparisons of target sample sizes for estimation of growth (Tar. growth, n) and maturity (Tar., mat., n) against available samples in the Pacific Marine Specimen Bank (PMSB growth and PMSB mat.), per region (Reg.).

Reg.	Tar. growth (n)	PMSB growth (n)	Tar. mat. (n)	PMSB mat. (n)
1-A	296	1	322	1
1-B	298	0	338	0
1-W	296	0	322	0
2-A	298	0	325	0
2-B	298	0	329	0

K Oceanic whitetip shark

Table K.1: Oceanic whitetip shark: average annual reported catch (Catch, thousands) and observed catch (Obs. catch, individuals), available length samples for estimation of length frequencies (LF samples, individuals), target biological sampling rate (Bio. samples, individuals), and maximum supplemental samples for estimation of maturity per length class (Mat. samples, individuals), per region (Reg.) and fleet (LL prefix denotes longline, FS prefix denotes purse seine fishing on free-schools, ASS prefix denotes purse seine fishing on associated schools, see Section 2).

Region	Fleet	Catch ('000s)	Obs. catch (n)	LF samples (n)	Bio. samples (n)	Mat. samples (n)
1-A	ASS-JP	0.57	2	20	87	3
1-A	FS-JP	0.57	6	2	87	3
1-A	LL-TW	0.43	32	107	65	2
1-A	ASS-FM	0.39	33	17	60	2
1-B	LL-US	2.17	359	85	300	10
1-W	ASS-JP	0.11	0	0	104	3
1-W	FS-JP	0.06	0	0	57	2
1-W	LL-TW	0.06	0	7	56	2
1-W	ASS-PH	0.05	0	0	45	1
1-W	FS-PG	0.04	0	0	38	1
2-A	ASS-SB	6.32	12	74	97	3
2-A	FS-PG	5.17	38	86	79	3
2-A	ASS-TW	4.92	53	66	76	3
2-A	ASS-PG	3.11	13	62	48	2
2-B	LL-KR	1.28	45	40	68	2
2-B	LL-CN	1.08	84	440	57	2
2-B	LL-TW	0.95	188	1366	50	2
2-B	ASS-US	0.84	124	86	44	1
2-B	LL-PF	0.79	94	88	42	1
2-B	ASS-ES	0.73	22	11	39	1

Table K.2: Oceanic whitetip shark - region 1-A: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, FS prefix denotes purse seine fishing on free-schools, ASS prefix denotes purse seine fishing on associated schools, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	ASS-JP		FS-JP		LL-TW		ASS-FM	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
1-A	40	0	3	0	3	0	2	0	2
1-A	50	0	3	0	3	0	2	0	2
1-A	60	3	0	1	2	1	1	2	0
1-A	70	2	1	6	0	2	0	2	0
1-A	80	4	0	4	0	6	0	2	0
1-A	90	5	0	8	0	6	0	4	0
1-A	100	8	0	6	0	6	0	5	0
1-A	110	12	0	8	0	6	0	9	0
1-A	120	18	0	11	0	7	0	12	0
1-A	130	11	0	8	0	10	0	7	0
1-A	140	7	0	10	0	9	0	5	0
1-A	150	4	0	5	0	7	0	3	0
1-A	160	6	0	5	0	2	0	4	0
1-A	170	2	1	3	0	3	0	1	1
1-A	180	1	2	5	0	1	1	1	1
1-A	190	1	2	4	0	0	0	1	1
1-A	200	1	2	3	0	0	0	1	1
1-A	210	0	0	2	0	0	0	0	0
1-A	220	2	0	0	0	0	0	1	0
1-A	230	0	0	0	0	0	0	0	0
1-A	240	0	0	0	0	0	0	0	0
1-A	250	0	0	1	0	0	0	0	0
1-A	260	0	0	0	0	0	0	0	0
1-A	270	0	0	0	0	0	0	0	0

Table K.3: Oceanic whitetip shark - region 1-B: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-US	
		Bio (n)	Mat (n)
1-B	40	0	10
1-B	50	14	0
1-B	60	39	0
1-B	70	46	0
1-B	80	28	0
1-B	90	7	3
1-B	100	11	0
1-B	110	18	0
1-B	120	39	0
1-B	130	46	0
1-B	140	18	0
1-B	150	11	0
1-B	160	4	6
1-B	170	11	0
1-B	180	4	6
1-B	190	4	6
1-B	200	0	10
1-B	210	4	0

Table K.4: Oceanic whitetip shark - region 1-W: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, FS prefix denotes purse seine fishing on free-schools, ASS prefix denotes purse seine fishing on associated schools, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	ASS-JP		FS-JP		LL-TW		ASS-PH		FS-PG	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
1-W	40	0	3	0	2	0	2	0	1	0	1
1-W	50	0	3	0	2	0	2	0	1	0	1
1-W	60	4	0	0	2	1	1	2	0	0	1
1-W	70	3	0	4	0	1	1	1	0	3	0
1-W	80	4	0	2	0	3	0	2	0	2	0
1-W	90	6	0	6	0	3	0	3	0	4	0
1-W	100	9	0	4	0	7	0	4	0	3	0
1-W	110	15	0	5	0	6	0	6	0	3	0
1-W	120	21	0	7	0	8	0	9	0	5	0
1-W	130	13	0	6	0	9	0	6	0	4	0
1-W	140	8	0	6	0	5	0	4	0	4	0
1-W	150	5	0	3	0	4	0	2	0	2	0
1-W	160	7	0	3	0	2	0	3	0	2	0
1-W	170	2	1	2	0	2	0	1	0	1	0
1-W	180	1	2	3	0	1	1	1	0	2	0
1-W	190	1	2	2	0	0	2	0	1	2	0
1-W	200	1	2	2	0	0	2	1	0	1	0
1-W	210	0	0	1	0	3	0	0	0	1	0
1-W	220	2	0	0	0	1	0	1	0	0	0
1-W	230	0	0	0	0	0	0	0	0	0	0
1-W	240	0	0	0	0	0	0	0	0	0	0
1-W	250	0	0	0	0	0	0	0	0	0	0
1-W	260	0	0	0	0	0	0	0	0	0	0
1-W	270	0	0	0	0	0	0	0	0	0	0

Table K.5: Oceanic whitetip shark - region 2-A: Target biological samples and supplemental samples for maturity estimation, per fleet (FS prefix denotes purse seine fishing on free-schools, ASS prefix denotes purse seine fishing on associated schools, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	ASS-SB		FS-PG		ASS-TW		ASS-PG	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
2-A	40	0	3	0	3	0	3	0	2
2-A	50	1	2	0	3	1	2	1	1
2-A	60	3	0	0	3	2	1	1	1
2-A	70	6	0	6	0	5	0	3	0
2-A	80	5	0	3	0	4	0	3	0
2-A	90	9	0	8	0	7	0	5	0
2-A	100	9	0	6	0	7	0	4	0
2-A	110	9	0	7	0	7	0	5	0
2-A	120	12	0	10	0	9	0	6	0
2-A	130	12	0	8	0	9	0	6	0
2-A	140	6	0	9	0	5	0	3	0
2-A	150	6	0	5	0	5	0	3	0
2-A	160	5	0	4	0	4	0	2	0
2-A	170	4	0	3	0	3	0	2	0
2-A	180	4	0	4	0	3	0	2	0
2-A	190	2	1	3	0	2	1	1	1
2-A	200	1	2	3	0	1	2	1	1
2-A	210	0	0	3	0	0	0	0	0
2-A	220	0	0	0	0	0	0	0	0
2-A	230	0	0	0	0	0	0	0	0
2-A	240	0	0	0	0	0	0	0	0
2-A	250	0	0	0	0	0	0	0	0
2-A	260	0	0	0	0	0	0	0	0
2-A	270	0	0	0	0	0	0	0	0
2-A	280	0	0	0	0	0	0	0	0
2-A	290	0	0	0	0	0	0	0	0
2-A	300	0	0	0	0	0	0	0	0
2-A	310	0	0	0	0	0	0	0	0

Table K.6: Oceanic whitetip shark - region 2-B: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, ASS prefix denotes purse seine fishing on associated schools, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-KR		LL-CN		LL-TW		ASS-US		LL-PF		ASS-ES	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
2-B	40	0	2	0	2	0	2	0	1	0	1	0	1
2-B	50	0	2	0	2	0	2	0	1	0	1	0	1
2-B	60	1	1	1	1	0	2	0	1	1	0	0	1
2-B	70	2	0	3	0	1	1	1	0	1	0	1	0
2-B	80	2	0	4	0	1	1	4	0	1	0	4	0
2-B	90	3	0	4	0	1	1	4	0	2	0	4	0
2-B	100	4	0	9	0	2	0	4	0	3	0	4	0
2-B	110	5	0	7	0	3	0	8	0	3	0	7	0
2-B	120	7	0	6	0	5	0	7	0	4	0	6	0
2-B	130	8	0	7	0	6	0	6	0	5	0	5	0
2-B	140	9	0	5	0	8	0	3	0	6	0	2	0
2-B	150	10	0	3	0	10	0	2	0	6	0	1	0
2-B	160	8	0	3	0	8	0	2	0	5	0	1	0
2-B	170	4	0	2	0	3	0	2	0	2	0	2	0
2-B	180	2	0	0	2	1	1	0	1	1	0	0	1
2-B	190	1	1	1	1	1	1	1	0	1	0	1	0
2-B	200	1	1	1	1	0	2	0	1	1	0	0	1
2-B	210	0	0	0	0	0	0	0	0	0	0	0	0
2-B	220	0	0	0	0	0	0	0	0	0	0	0	0
2-B	230	0	0	0	0	0	0	0	0	0	0	0	0
2-B	240	0	0	0	0	0	0	0	0	0	0	0	0
2-B	250	0	0	0	0	0	0	0	0	0	0	0	0

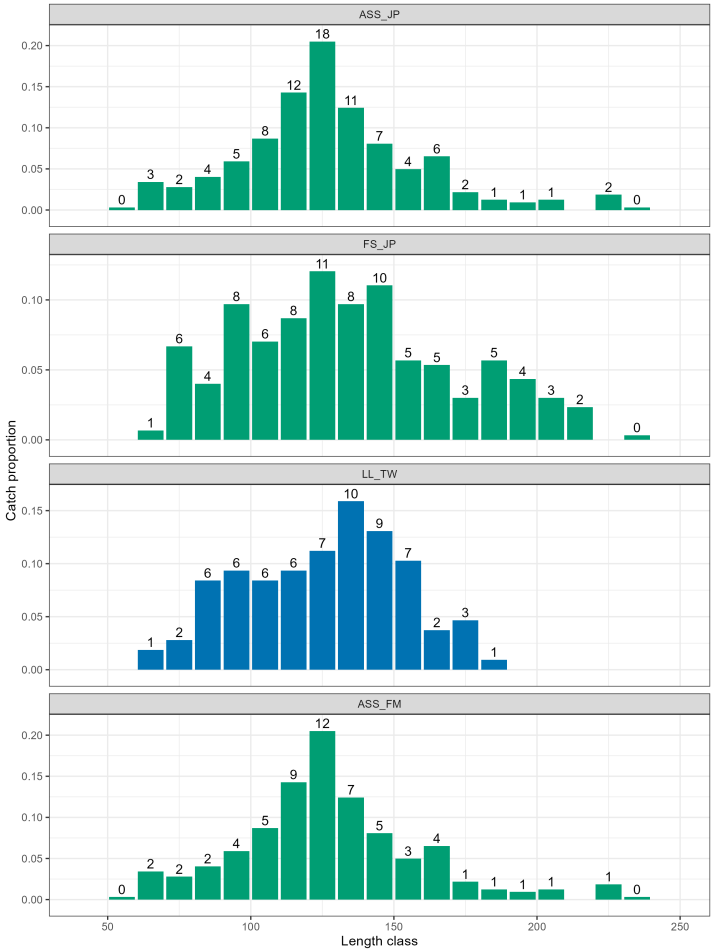


Figure K.1: The estimated length composition of oceanic whitetip shark catches in region 1-A per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

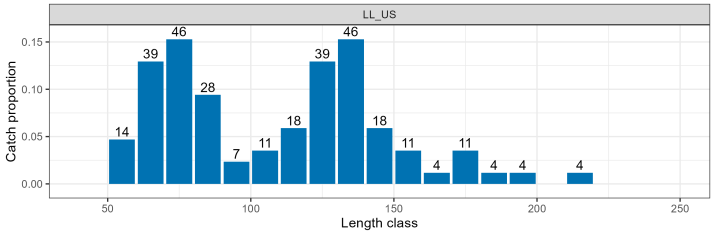


Figure K.2: The estimated length composition of oceanic whitetip shark catches in region 1-B per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

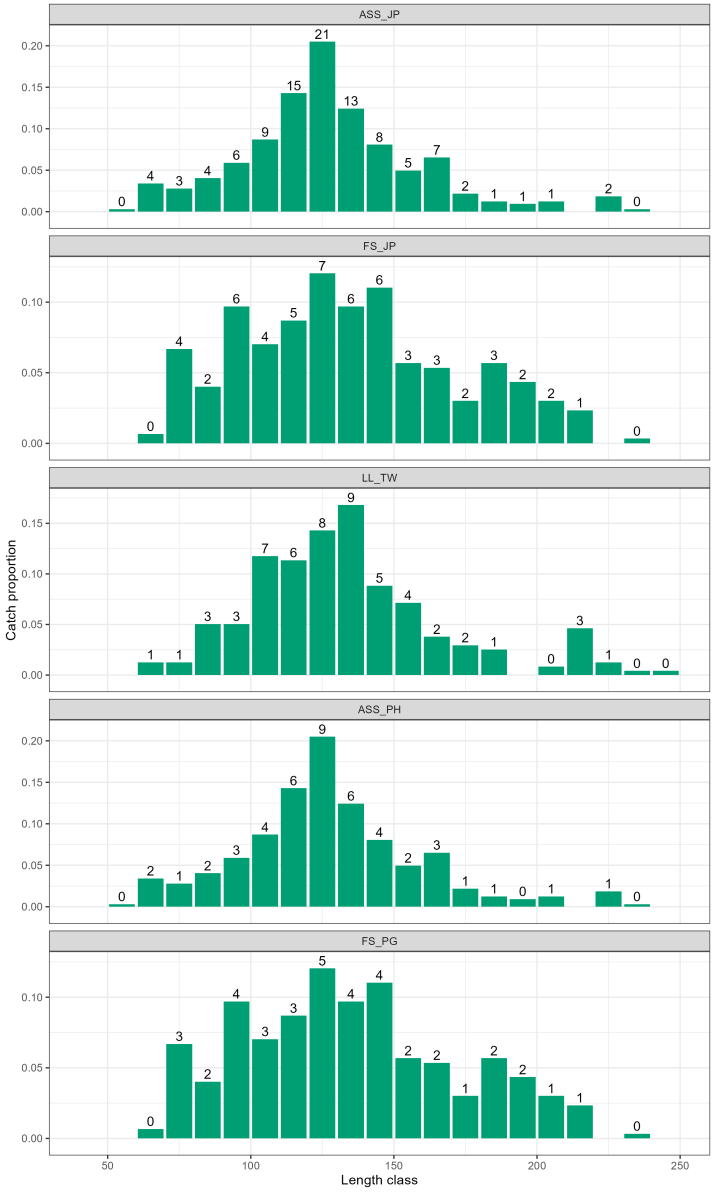


Figure K.3: The estimated length composition of oceanic whitetip shark catches in region 1-W per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

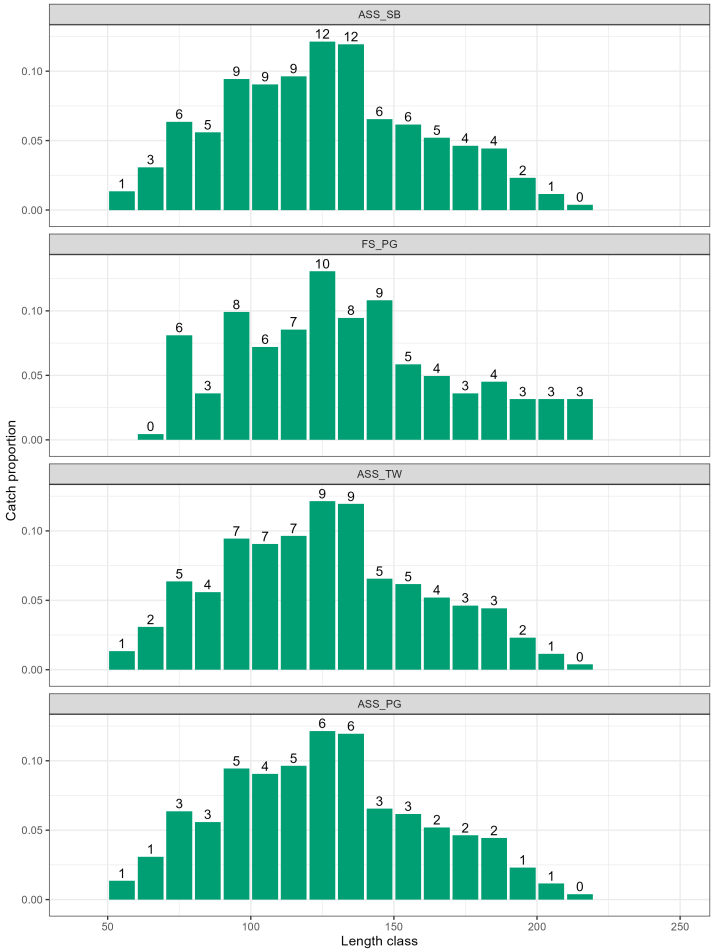


Figure K.4: The estimated length composition of oceanic whitetip shark catches in region 2-A per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

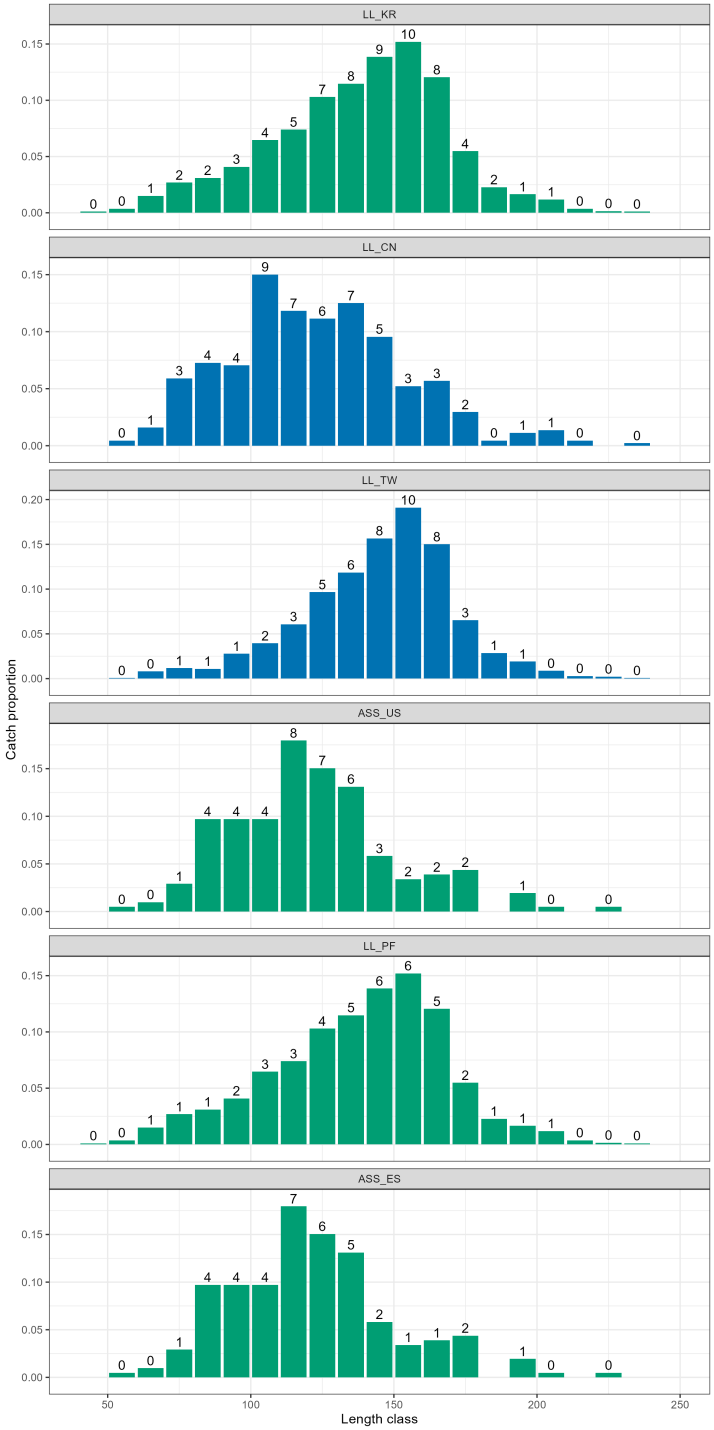


Figure K.5: The estimated length composition of oceanic whitetip shark catches in region 2-B per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

Table K.7: Oceanic whitetip shark: comparisons of target sample sizes for estimation of growth (Tar. growth, n) and maturity (Tar., mat., n) against available samples in the Pacific Marine Specimen Bank (PMSB growth and PMSB mat.), per region (Reg.).

Reg.	Tar. growth (n)	PMSB growth (n)	Tar. mat. (n)	PMSB mat. (n)
1-A	303	1	339	1
1-B	304	0	345	0
1-W	299	0	335	0
2-A	298	0	330	0
2-B	297	0	338	0

L Shortfin mako

Table L.1: Shortfin mako: average annual reported catch (Catch, thousands) and observed catch (Obs. catch, individuals), available length samples for estimation of length frequencies (LF samples, individuals), target biological sampling rate (Bio. samples, individuals), and maximum supplemental samples for estimation of maturity per length class (Mat. samples, individuals), per region (Reg.) and fleet (LL prefix denotes longline, see Section 2).

Region	Fleet	Catch ('000s)	Obs. catch (n)	LF samples (n)	Bio. samples (n)	Mat. samples (n)
1-A	LL-CN	0.60	23	102	85	3
1-A	LL-SB	0.36	0	96	51	2
1-A	LL-NC	0.36	23	98	51	2
1-A	LL-TW	0.29	3	88	41	1
1-A	LL-FJ	0.27	0	0	38	1
1-A	LL-JP	0.24	2	7	34	1
1-B	LL-FJ	1.34	141	585	93	3
1-B	LL-CN	1.22	43	191	84	3
1-B	LL-TW	0.87	74	1346	60	2
1-B	LL-KR	0.47	9	28	33	1
1-B	LL-PF	0.44	12	14	30	1
2-A	LL-AU	0.87	0	490	106	4
2-A	LL-JP	0.63	21	3	76	3
2-A	LL-TW	0.46	44	764	56	2
2-A	LL-CN	0.29	0	0	35	1
2-A	LL-NZ	0.23	3	139	28	1
2-B	LL-TW	1.25	65	639	115	4
2-B	LL-NZ	0.79	39	630	73	2
2-B	LL-VU	0.73	2	96	67	2
2-B	LL-CN	0.48	1	22	45	1

Table L.2: Shortfin mako - region 1-A: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-CN		LL-SB		LL-NC		LL-TW		LL-FJ		LL-JP	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
1-A	50	0	3	0	2	0	2	0	1	0	1	0	1
1-A	60	0	3	0	2	0	2	0	1	0	1	0	1
1-A	70	0	3	0	2	0	2	0	1	0	1	0	1
1-A	80	0	3	0	2	0	2	0	1	0	1	0	1
1-A	90	1	2	1	1	1	1	0	1	0	1	0	1
1-A	100	1	2	0	2	0	2	0	1	0	1	0	1
1-A	110	2	1	1	1	1	1	1	0	1	0	1	0
1-A	120	2	1	1	1	1	1	1	0	1	0	1	0
1-A	130	3	0	2	0	2	0	1	0	1	0	1	0
1-A	140	5	0	3	0	3	0	2	0	2	0	2	0
1-A	150	5	0	3	0	3	0	3	0	2	0	2	0
1-A	160	9	0	5	0	5	0	4	0	4	0	4	0
1-A	170	11	0	7	0	7	0	5	0	5	0	4	0
1-A	180	14	0	8	0	8	0	7	0	6	0	6	0
1-A	190	9	0	5	0	5	0	4	0	4	0	3	0
1-A	200	8	0	5	0	5	0	4	0	4	0	3	0
1-A	210	5	0	3	0	3	0	2	0	2	0	2	0
1-A	220	3	0	2	0	2	0	2	0	1	0	1	0
1-A	230	2	1	1	1	1	1	1	0	1	0	1	0
1-A	240	2	1	1	1	1	1	1	0	1	0	1	0
1-A	250	1	2	0	2	0	2	0	1	0	1	0	1
1-A	260	1	2	0	2	0	2	0	1	0	1	0	1
1-A	270	0	0	0	0	0	0	0	0	0	0	0	0
1-A	280	0	0	0	0	0	0	0	0	0	0	0	0
1-A	290	0	0	0	0	0	0	0	0	0	0	0	0
1-A	300	0	0	0	0	0	0	0	0	0	0	0	0
1-A	310	0	0	0	0	0	0	0	0	0	0	0	0
1-A	320	0	0	0	0	0	0	0	0	0	0	0	0
1-A	330	0	0	0	0	0	0	0	0	0	0	0	0
1-A	340	0	0	0	0	0	0	0	0	0	0	0	0
1-A	350	0	0	0	0	0	0	0	0	0	0	0	0
1-A	360	0	0	0	0	0	0	0	0	0	0	0	0
1-A	370	0	0	0	0	0	0	0	0	0	0	0	0
1-A	380	0	0	0	0	0	0	0	0	0	0	0	0
1-A	390	0	0	0	0	0	0	0	0	0	0	0	0
1-A	400	0	0	0	0	0	0	0	0	0	0	0	0

Table L.3: Shortfin mako - region 1-B: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-FJ		LL-CN		LL-TW		LL-KR		LL-PF	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
1-B	50	0	3	0	3	0	2	0	1	0	1
1-B	60	0	3	0	3	0	2	0	1	0	1
1-B	70	0	3	2	1	0	2	0	1	0	1
1-B	80	0	3	1	2	0	2	0	1	0	1
1-B	90	1	2	4	0	0	2	0	1	0	1
1-B	100	2	1	2	1	0	2	0	1	0	1
1-B	110	2	1	1	2	1	1	1	0	0	1
1-B	120	5	0	4	0	1	1	1	0	1	0
1-B	130	6	0	4	0	3	0	2	0	2	0
1-B	140	10	0	4	0	4	0	2	0	2	0
1-B	150	14	0	7	0	6	0	4	0	3	0
1-B	160	15	0	10	0	8	0	4	0	4	0
1-B	170	15	0	15	0	8	0	5	0	4	0
1-B	180	10	0	10	0	9	0	4	0	4	0
1-B	190	6	0	4	0	9	0	4	0	3	0
1-B	200	3	0	9	0	4	0	2	0	2	0
1-B	210	2	1	3	0	3	0	1	0	1	0
1-B	220	1	2	1	2	2	0	1	0	1	0
1-B	230	0	3	2	1	1	1	0	1	0	1
1-B	240	0	3	1	2	0	2	0	1	0	1
1-B	250	0	3	0	3	0	2	0	1	0	1
1-B	260	0	3	1	2	0	2	0	1	0	1
1-B	270	0	0	1	0	0	0	0	0	0	0
1-B	280	0	0	0	0	0	0	0	0	0	0
1-B	290	0	0	0	0	0	0	0	0	0	0
1-B	300	0	0	0	0	0	0	0	0	0	0

Table L.4: Shortfin mako - region 2-A: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-AU		LL-JP		LL-TW		LL-CN		LL-NZ	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
2-A	50	0	4	0	3	0	2	0	1	0	1
2-A	60	1	3	0	3	0	2	0	1	0	1
2-A	70	3	1	0	3	0	2	0	1	0	1
2-A	80	8	0	0	3	0	2	0	1	1	0
2-A	90	9	0	1	2	1	1	0	1	0	1
2-A	100	5	0	2	1	1	1	1	0	0	1
2-A	110	3	1	2	1	1	1	1	0	1	0
2-A	120	6	0	3	0	2	0	1	0	1	0
2-A	130	4	0	3	0	2	0	1	0	1	0
2-A	140	5	0	3	0	2	0	1	0	2	0
2-A	150	9	0	5	0	4	0	2	0	3	0
2-A	160	6	0	7	0	5	0	3	0	2	0
2-A	170	8	0	8	0	6	0	3	0	3	0
2-A	180	8	0	10	0	7	0	4	0	2	0
2-A	190	5	0	12	0	9	0	6	0	3	0
2-A	200	8	0	8	0	6	0	4	0	3	0
2-A	210	3	1	6	0	4	0	3	0	2	0
2-A	220	3	1	3	0	2	0	1	0	1	0
2-A	230	2	2	2	1	1	1	1	0	1	0
2-A	240	3	1	0	3	0	2	0	1	0	1
2-A	250	3	1	1	2	1	1	0	1	0	1
2-A	260	0	4	0	3	0	2	0	1	0	1
2-A	270	1	0	0	0	0	0	0	0	0	0
2-A	280	0	0	0	0	0	0	0	0	0	0
2-A	290	0	0	0	0	0	0	0	0	0	0
2-A	300	3	0	0	0	0	0	0	0	0	0
2-A	310	0	0	0	0	0	0	0	0	0	0
2-A	320	1	0	0	0	0	0	0	0	0	0
2-A	330	0	0	0	0	0	0	0	0	0	0
2-A	340	0	0	0	0	0	0	0	0	0	0
2-A	350	1	0	0	0	0	0	0	0	0	0
2-A	360	0	0	0	0	0	0	0	0	0	0
2-A	370	0	0	0	0	0	0	0	0	0	0
2-A	380	0	0	0	0	0	0	0	0	0	0

Table L.5: Shortfin mako - region 2-B: Target biological samples and supplemental samples for maturity estimation, per fleet (LL prefix denotes longline, see Section 2) and length class (Len., cm).

Reg.	Len. (cm)	LL-TW		LL-NZ		LL-VU		LL-CN	
		Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)	Bio (n)	Mat (n)
2-B	50	0	4	1	1	0	2	0	1
2-B	60	1	3	3	0	0	2	0	1
2-B	70	0	4	8	0	0	2	0	1
2-B	80	2	2	7	0	1	1	1	0
2-B	90	4	0	7	0	2	0	1	0
2-B	100	3	1	3	0	2	0	1	0
2-B	110	4	0	3	0	2	0	1	0
2-B	120	4	0	6	0	3	0	2	0
2-B	130	5	0	5	0	3	0	2	0
2-B	140	6	0	5	0	3	0	2	0
2-B	150	10	0	7	0	6	0	4	0
2-B	160	13	0	4	0	7	0	5	0
2-B	170	13	0	4	0	7	0	5	0
2-B	180	13	0	2	0	8	0	5	0
2-B	190	12	0	2	0	7	0	5	0
2-B	200	10	0	3	0	6	0	4	0
2-B	210	8	0	1	1	5	0	3	0
2-B	220	4	0	1	1	2	0	1	0
2-B	230	2	2	0	2	1	1	1	0
2-B	240	1	3	0	2	1	1	0	1
2-B	250	0	4	0	2	0	2	0	1
2-B	260	1	3	0	2	0	2	0	1
2-B	270	0	0	0	0	0	0	0	0
2-B	280	0	0	0	0	0	0	0	0
2-B	290	0	0	0	0	0	0	0	0
2-B	300	0	0	0	0	0	0	0	0
2-B	310	0	0	0	0	0	0	0	0
2-B	320	0	0	0	0	0	0	0	0
2-B	330	0	0	0	0	0	0	0	0
2-B	340	0	0	0	0	0	0	0	0
2-B	350	0	0	0	0	0	0	0	0

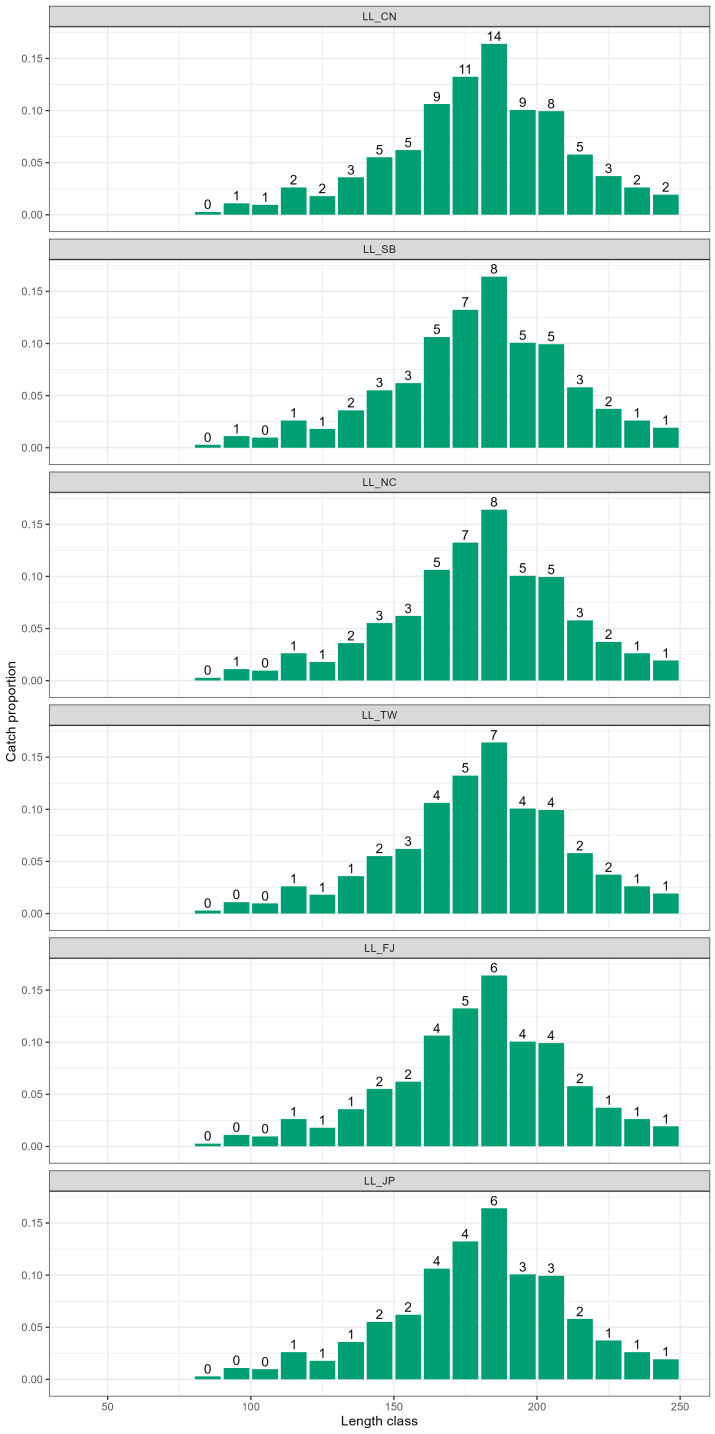


Figure L.1: The estimated length composition of shortfin mako catches in region 1-A per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

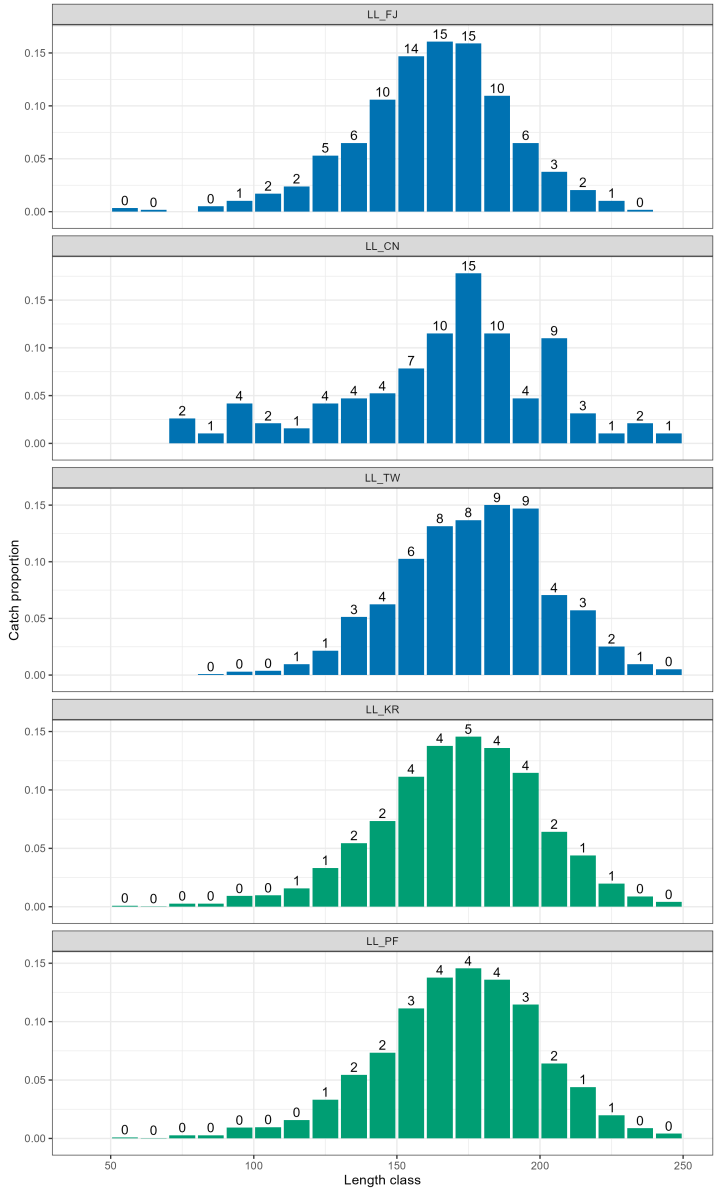


Figure L.2: The estimated length composition of shortfin mako catches in region 1-B per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

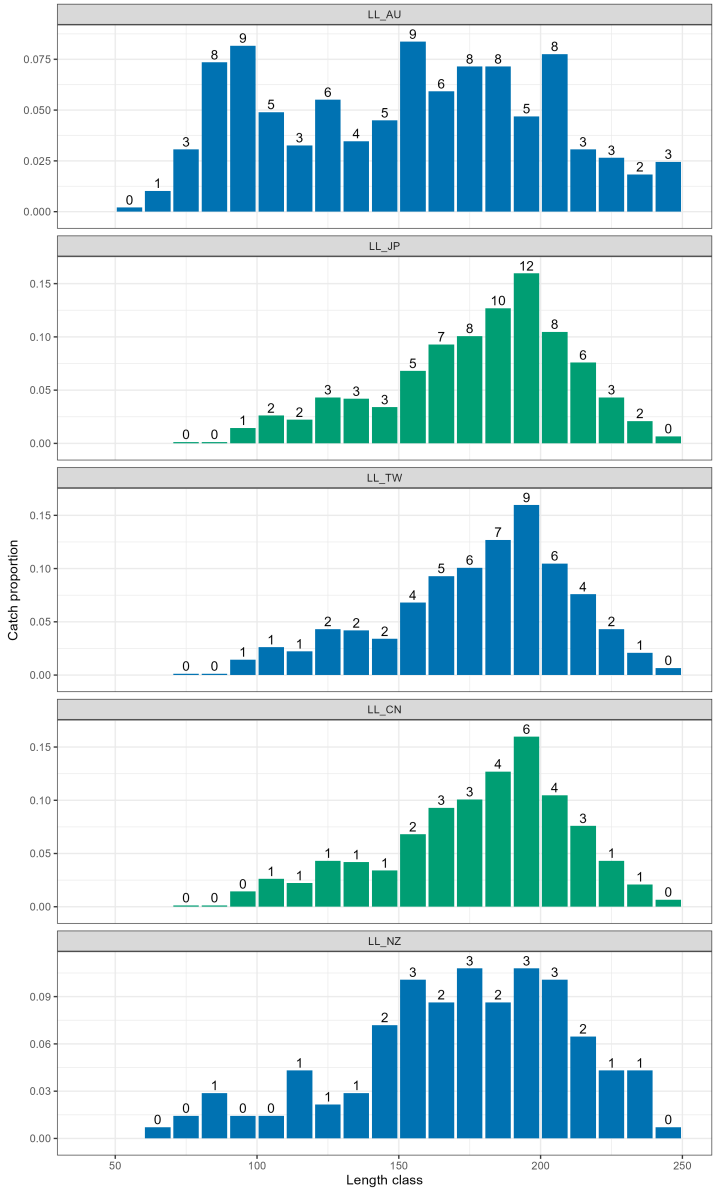


Figure L.3: The estimated length composition of shortfin mako catches in region 2-A per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

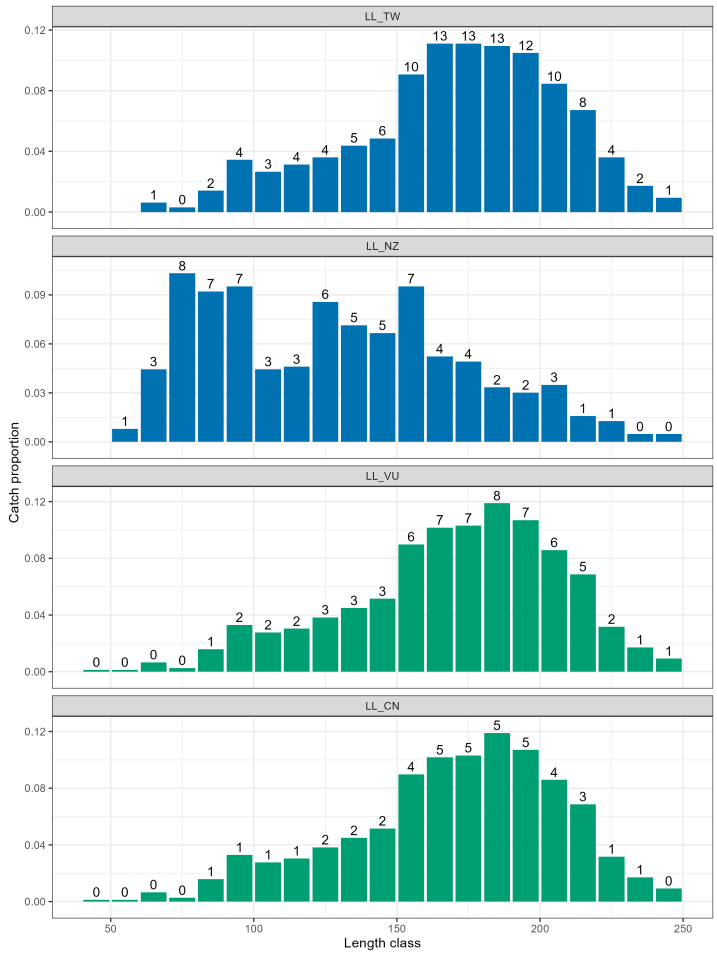


Figure L.4: The estimated length composition of shortfin mako catches in region 2-B per sampling fleet and the target number of biological samples per length class for estimation of growth (numbers at top of bars). The colour of the bars denotes the origin of the estimated length compositions, where blue = based on available data for the fleet, and green = based on proxy fleet(s).

Table L.6: Shortfin mako: comparisons of target sample sizes for estimation of growth (Tar. growth, n) and maturity (Tar., mat., n) against available samples in the Pacific Marine Specimen Bank (PMSB growth and PMSB mat.), per region (Reg.).

Reg.	Tar. growth (n)	PMSB growth (n)	Tar. mat. (n)	PMSB mat. (n)
1-A	285	0	371	0
1-B	295	0	390	0
2-A	296	0	373	0
2-B	297	0	353	0