

Summary of making non-detriment findings

Species: Blue shark (*Prionace glauca*), North Pacific Population

2 NDF can be made when the specimen is:		
(1)	The specimen is collected before the listing in Appendix.	N/A
(2)	The specimen is not a nature origin such as: ① Bred from parents collected before listing in Appendix. ② Bred from parents which were imported under the CITES procedures. ③ Bred from parents which met the requirement of NDF. ④ Others (Bred under a robust technique which was proved to be able to make F2.)	N/A
(3)	The specimen is collected from a part of an individual by a method without affecting the survival of the individual (such as a specimen of biopsy sampling, an embryo, spermatozoa and so on).	N/A
(4)	The specimen is collected from a dead individual and it is reasonably considered that the death is not attributable to the specimen collector, e.g., a stranded whale. (A by-caught individual is excluded from this category.)	N/A
3 When a specimen does not meet any criterion of paragraph 2 above, NDF should be basically considered, taking into account the following information:		
(1)	Biological characteristic and life history of the species	Life span of blue shark in the Pacific Ocean is generally estimated to be over 20 years old. The reproductive system is placental viviparity with mean litter size is 35.5 (range: 15-112), and the reproductive cycle is estimated as one year (annual). The precaudal length at maturity is between 140-160 cm for both sexes, and it corresponds to 6 years old for females and 5 years old for males.
(2)	Distribution range of the species (historical and present)	Blue shark is distributed from tropical to temperate waters globally. In particular, high abundance is observed in temperate waters.
(3)	Stock structure, status and trend of the species	Productivity of blue shark is higher than that of other pelagic sharks. The intrinsic rate of population increases (median) estimated from matrix population model with consideration of sex and age is 0.384. This estimate implies that the stock size can increase approximately 1.5 fold within one year in absence of fishing impacts.
(8)	Monitoring of the species status	
(9)	Conservation of the species	In 2022, stock assessment was conducted using an integrated model (Stock Synthesis : SS) . The results shows that the median of the annual spawning stock biomass (SSB) had a steadily decreasing trend until 1992 and slightly increased until recent years. The median of the annual age-0 recruitment is estimated to be relatively stable around 10 million individuals except for 1988. Median female SSB in 2020 is estimated to be 1.170 of SSBMSY (80% confidence interval : 0.570-1.776) . This indicates that the current stock status is likely (63.5% probability) not in an overfished condition relative to Maximum Sustainable Yield (MSY)-based reference points. Recent annual fishing mortality rate (F) (F2017-2019) (median) was estimated to be below FMSY and overfishing of the stock is very likely (91.9% probability) not occurring relative to MSY-based reference points. As a conclusion of stock assessment, there is a 61.9% joint probability that this stock is not in an overfished condition and that overfishing is not occurring relative to MSY based reference points.
(4)	Threats to the species	Bycatch by tuna longline fishery etc.
(5)	Historical and present fishing situation and mortality rate of the species	A large number of blue sharks are mainly caught by tuna longline fishery as bycatch, but Japanese offshore shallow-set longline fishery targets this species seasonally. The total annual landings at main fishing ports in Japan range 5,100-16,000 tons (mean: 10,251 tons) from 1992 to 2021. Currently, all tuna Regional Fishery Management Organizations (RFMOs) obligate the full utilization of sharks caught by fisheries and submission of those fishery data. Under Western and Central Pacific Fisheries Commission (WCPFC), Commission Members, Cooperating Non-Members and Participating Territories (CCMs) shall require their vessels to land sharks with fins naturally attached to the carcass or CCMs may take alternative measures such as keeping the removed fin and carcass within the same bag. In addition, it was agreed that 1) CCMs shall ensure that their vessels comply with not to use or carry wire trace as branch lines or leaders; or not to use the shark lines, and 2) CCMs shall develop and report their management plans including the measures to limit the fishing at the level for longline fisheries targeting sharks. Under this regulation, offshore fishery in Kesennuma has implemented the management plan which established the upper limit of landing of blue shark as 600 tons etc. since January 2021.
(6)	Introduced and proposed management measures for the species	
(7)	Compliance situation of the management measures	
(10)	Continuity of the role of the species in the ecosystem	Generally, it is assumed to be one of the top predators.
(11)	Effects of illegal trade on the survival of the species	Unknown.
5 When NDF is considered based on the information in paragraph 3 above, as a first step, items iii), v) and vi) of paragraph 3 should be considered in accordance with the following criteria in order. If these three items meet requirements in the criteria, the other items in paragraph 3 also should be considered to judge whether NDF can be made.		
(1)	When a TAC of the species is established or calculated on scientific bases, the present total catch of the species including the export is less than the amount of the TAC.	
(2)	In case that establishment or calculation of a TAC of the species on scientific bases is difficult, but the stock trend can be estimated for a certain period based on catch or other data, the stock does not show a decreasing trend and the present total catch of the species including the export is less than the average past catch amount of the species. (The length of the period depends on biological characteristic of the species.)	
(3)	In case that establishment or calculation of a TAC of the species on scientific bases is difficult and 5. ii) above is not applicable, the stock is considered to be maintained through the management measures which have been introduced or will be introduced in the near future. In making judgment of the effect of the management measures, the following information should be considered: a) Protected areas are effectively established. b) Time closure is effectively established. c) It is estimated that the fishing pressure has been decreased substantially because the number of fishermen to catch the species is regulated and the number has been substantially decreased over a long period. d) Regulation of fishing gear is effectively established. e) Individuals smaller than a certain size are protected. f) Other effective management measures (such as release of females, prohibition of bottom trawl, restriction of power of light and so on) are established. g) Combination of above mentioned measures brings the same conservation effect.	
(4)	In case that establishment or calculation of a TAC of the species on scientific bases is difficult and neither 5. ii) nor iii) is applicable, the annual catch amount of the species is considered negligible against the estimated stock size. In estimating the stock size, the minimum stock size should be estimated, taking into account, inter alia, the past catch record, the area of distribution, the stock size and productivity of look-alike species as well as the catch amount and the maximum fishing efficiency. The "negligible level" should in principle follow the table below, depending on the productivity of the species. When any parameter of the species falls under a less productivity category, the species shall be regarded as belonging to the category.	
(5)	The species is considered to be maintained under the present fishing activities because of the stock enhancement activities for the species	
7	For a specific aquatic species, NDF prior to trades within a certain period (hereinafter referred to as comprehensive NDF) can be made when identification of look-alike species is clearly possible or the species meets at least one of the criteria 2(i), 5(i)-(iv), and is considered to be able to make NDF for a certain period. However, when a scientific stock assessment shows that the stock of the species becomes worse etc., the comprehensive NDF may be suspended.	Yes. Blue shark was decided to be listed in Appendix II as look-alike species at the CITES COP19 in 2022. Identification of specimens is clearly possible because they are clearly possible to be identified at the time of catch and/or landing, etc., and copies of all documentation to the transaction of the specimens from the catch or landing to export are provided. In addition, as described in 3(3), there is a 61.9% joint probability that this stock is not in an overfished condition and that overfishing is not occurring relative to MSY based reference points.
Conclusion		NDF can be made.

Parameters	Productivity		
	Low	Middle	High
Natural mortality rate (M)	$M < 0.2$	$0.2 \leq M \leq 0.5$	$0.5 < M$
Intrinsic rate of Natural increase (R)	$R < 0.14$	$0.14 \leq R \leq 0.35$	$0.35 < R$
von Bertalanffy growth rate (K)	$K < 0.15$	$0.15 \leq K \leq 0.33$	$0.33 < K$
Age at maturity (t mat)	$8 < t \text{ mat}$	$3.3 \leq t \text{ mat} \leq 8$	$t \text{ mat} < 3.3$
Maximum age (t max)	$25 < t \text{ max}$	$14 \leq t \text{ max} \leq 25$	$t \text{ max} < 14$
Generation interval (G)	$10 < G$	$5 \leq G \leq 10$	$G < 5$
Negligible level 1 (Recovery Index (Fr) =0.1)	0.7%	1.2% ²	1.8% ³

1 "negligible level" can be calculated as $R \cdot Fr / 2$ by the method of Wade 1998.
2 Median value of R is used as there are ranges.
3 0.35 is used as R

Summary of making non-detriment findings

Species: Blue shark (*Prionace glauca*), South Pacific Population

2 NDF can be made when the specimen is:		
(1) The specimen is collected before the listing in Appendix.		N/A
(2) The specimen is not a nature origin such as: ① Bred from parents collected before listing in Appendix. ② Bred from parents which were imported under the CITES procedures. ③ Bred from parents which met the requirement of NDF. ④ Others (Bred under a robust technique which was proved to be able to make F2.)		N/A
(3) The specimen is collected from a part of an individual by a method without affecting the survival of the individual (such as a specimen of biopsy sampling, an embryo, spermatozoa and so on).		N/A
(4) The specimen is collected from a dead individual and it is reasonably considered that the death is not attributable to the specimen collector, e.g., a stranded whale. (A by-caught individual is excluded from this category.)		N/A
3 When a specimen does not meet any criterion of paragraph 2 above, NDF should be basically considered, taking into account the following information:		
(1) Biological characteristic and life history of the species		Life span of blue shark in the Pacific Ocean is generally estimated to be over 20 years old. The reproductive system is placental viviparity with mean litter size is 35.5 (range: 15-112) and the reproductive cycle is estimated as one year (annual). The precaudal length at maturity is estimated to be 170-190 cm for females and 190-195 cm for males.
(2) Distribution range of the species (historical and present)		Blue shark is distributed from tropical to temperate waters globally. In particular, high abundance is observed in the temperate water.
(3) Stock structure, status and trend of the species (8) Monitoring of the species status (9) Conservation of the species		Productivity of blue shark is higher than that of other pelagic sharks. The intrinsic rate of population increase (median) estimated from matrix population model with consideration of sex and age was 0.384. This estimate implies that the stock size can increase approximately 1.5 fold within one year in absence of fishing impacts. In 2021, stock assessments were conducted using an integrated model (Stock Synthesis : SS) and a surplus production model based on the logbook data provided by Japan, Taiwan and EU etc. between 1995 and 2020. Both models showed similar results. Based on the results and their associated information, the stock biomass in recent years has been highly likely increased and the fishing pressure in recent 10 years has decreased. The Scientific Committee of WCPFC advised that this stock is unlikely to be overfished and it is unlikely that overfishing is occurring when considered against MSY.
(4) Threats to the species		Bycatch by tuna longline fishery etc.
(5) Historical and present fishing situation and mortality rate of the species (6) Introduced and proposed management measures for the species (7) Compliance situation of the management measures		A large number of blue sharks are mainly caught by tuna longline fishery as bycatch, but Japanese offshore shallow-set longline fishery targets this species seasonally. The total landings at main fishing ports in Japan ranges 5,100-16,000 tons (mean: 10,251 tons) from 1992 to 2021. Currently, all tuna Regional Fishery Management Organizations (RFMOs) obligate the full utilization of sharks caught by fisheries and submission of those fishery data. Western and Central Pacific Fisheries Commission (WCPFC), Commission Members, Cooperating Non-Members and Participating Territories (CCMs) shall require their vessels to land sharks with fins naturally attached to the carcass or CCMs may take alternative measures such as keeping the removed fin and carcass within the same bag. In addition, it was agreed that 1) CCMs shall ensure that their vessels comply with not to use or carry wire trace as branch lines or leaders; or not to use the shark lines, and 2) CCMs shall develop and report their management plans including the measures to limit the fishing at the level for longline fisheries targeting sharks.
(10) Continuity of the role of the species in the ecosystem		Generally, it is assumed to be one of the top predators.
(11) Effects of illegal trade on the survival of the species		Unknown.
5 When NDF is considered based on the information in paragraph 3 above, as a first step, items (iii), (v) and (vi) of paragraph 3 should be considered in accordance with the following criteria in order. If these three items meet requirements in the criteria, the other items in paragraph 3 also should be considered to judge whether NDF can be made.		
(1) When a TAC of the species is established or calculated on scientific bases, the present total catch of the species including the export is less than the amount of the TAC.		
(2) In case that establishment or calculation of a TAC of the species on scientific bases is difficult, but the stock trend can be estimated for a certain period based on catch or other data, the stock does not show a decreasing trend and the present total catch of the species including the export is less than the average past catch amount of the species. (The length of the period depends on biological characteristic of the species.)		
(3) In case that establishment or calculation of a TAC of the species on scientific bases is difficult and 5. ii) above is not applicable, the stock is considered to be maintained through the management measures which have been introduced or will be introduced in the near future. In making judgment of the effect of the management measures, the following information should be considered: a) Protected areas are effectively established. b) Time closure is effectively established. c) It is estimated that the fishing pressure has been decreased substantially because the number of fishermen to catch the species is regulated and the number has been substantially decreased over a long period. d) Regulation of fishing gear is effectively established. e) Individuals smaller than a certain size are protected. f) Other effective management measures (such as release of females, prohibition of bottom trawl, restriction of power of light and so on) are established. g) Combination of above mentioned measures brings the same conservation effect.		
(4) In case that establishment or calculation of a TAC of the species on scientific bases is difficult and neither 5. ii) nor iii) is applicable, the annual catch amount of the species is considered negligible against the estimated stock size. In estimating the stock size, the minimum stock size should be estimated, taking into account, inter alia, the past catch record, the area of distribution, the stock size and productivity of look-alike species as well as the catch amount and the maximum fishing efficiency. The "negligible level" should in principle follow the table below, depending on the productivity of the species. When any parameter of the species falls under a less productivity category, the species shall be regarded as belonging to the category.		
(5) The species is considered to be maintained under the present fishing activities because of the stock enhancement activities for the species		
7 For a specific aquatic species, NDF prior to trades within a certain period (hereinafter referred to as comprehensive NDF) can be made when identification of look-alike species is clearly possible or the species meets at least one of the criteria 2(i), 5(i)-(iv), and is considered to be able to make NDF for a certain period. However, when a scientific stock assessment shows that the stock of the species becomes worse etc., the comprehensive NDF may be suspended.		Yes. Blue shark was decided to be listed in Appendix II as look-alike species at the CITES COP19 in 2022. Identification of specimens is clearly possible because they are clearly possible to be identified at the time of catch and/or landing, etc., and copies of all documentation to the transaction of the specimens from the catch or landing to export are provided. In addition, as described above 3(3), the Scientific Committee of WCPFC advised that the Southwest Pacific blue shark is unlikely to be overfished and it is unlikely that overfishing is occurring when considered against MSY.
Conclusion		NDF can be made.

Parameters	Productivity		
	Low	Middle	High
Natural mortality rate (M)	$M < 0.2$	$0.2 \leq M \leq 0.5$	$0.5 < M$
Intrinsic rate of Natural increase (R)	$R < 0.14$	$0.14 \leq R \leq 0.35$	$0.35 < R$
von Bertalanffy growth rate (K)	$K < 0.15$	$0.15 \leq K \leq 0.33$	$0.33 < K$
Age at maturity (t mat)	$8 < t \text{ mat}$	$3.3 \leq t \text{ mat} \leq 8$	$t \text{ mat} < 3.3$
Maximum age (t max)	$25 < t \text{ max}$	$14 \leq t \text{ max} \leq 25$	$t \text{ max} < 14$
Generation interval (G)	$10 < G$	$5 \leq G \leq 10$	$G < 5$
Negligible level 1 (Recovery Index (Fr)=0.1)	0.7%	1.2% ²	1.8% ³

1 "negligible level" can be calculated as $R * Fr / 2$ by the method of Wade 1998.
2 Median value of R is used as there are ranges.
3 0.35 is used as R

Summary of making non-detriment findings

Species: Blue shark (*Prionace glauca*), Indian Ocean Population

2 NDF can be made when the specimen is:		
(1) The specimen is collected before the listing in Appendix.		N/A
(2) The specimen is not a nature origin such as: ① Bred from parents collected before listing in Appendix. ② Bred from parents which were imported under the CITES procedures. ③ Bred from parents which met the requirement of NDF. ④ Others (Bred under a robust technique which was proved to be able to make F2.)		N/A
(3) The specimen is collected from a part of an individual by a method without affecting the survival of the individual (such as a specimen of biopsy sampling, an embryo, spermatozoa and so on).		N/A
(4) The specimen is collected from a dead individual and it is reasonably considered that the death is not attributable to the specimen collector, e.g., a stranded whale. (A by-caught individual is excluded from this category.)		N/A
3 When a specimen does not meet any criterion of paragraph 2 above, NDF should be basically considered, taking into account the following information:		
(1) Biological characteristic and life history of the species		Mean generation time is estimated to be 8 to 10 years old. Reproductive system is placental viviparity with mean litter size is 38 (range: 4–135). Length at 50% maturity (total length) is estimated as 201 cm for males and 194 cm for females. Age at 50% maturity is estimated as 7 years old for males and 6 years old for females.
(2) Distribution range of the species (historical and present)		Blue shark is distributed from tropical to temperate waters globally, including the Indian Ocean.
(3) Stock structure, status and trend of the species		In the Indian Ocean Tuna Commission (IOTC) Working Party of Bycatch and Ecosystem in 2021, stock assessment was conducted using a length-based integrated model (Stock Synthesis: SS) with data from 1950 to 2019. Six annual abundance indices (EU-Spain, EU-Portugal, Japan, Taiwan, South Africa, and Réunion) were used for the assessment. Some indices showed inconsistent trends, but the overall annual trends were flat and relatively stable. Japanese CPUE showed a large annual fluctuation, but the long-term trend was flat and relatively stable, which was the same as the overall annual trends. The results of stock assessment showed that current stock status is not overfished and not overfishing relative to MSY based reference points. From the result of the 10-year future projection, the probability that the level of stock (median of biomass) is above BMSY (41,988 tons) is high under the continuation of the catch level in 2019 (41,988 tons).
(8) Monitoring of the species status		
(9) Conservation of the species		
(4) Threats to the species		Bycatch by tuna longline fishery etc.
(5) Historical and present fishing situation and mortality rate of the species		A large number of blue sharks are mainly caught by tuna longline fishery as bycatch, but this species is frequently caught as a target species by semi-industrial fishery other than industrial longline and purse seine fishery, and artisanal fishery in the Indian Ocean. Japanese deep-set longline fishery targeting bigeye tuna in tropical waters and Japanese shallow-set longline fishery targeting southern bluefin tuna in temperate waters catch blue sharks as bycatch. Annual Japan's catch of blue shark calculated from logbook data of longline fishery ranges from 310 to 2,700 tons for 1994-2021.
(6) Introduced and proposed management measures for the species		Currently, all tuna Regional Fishery Management Organizations (RFMOs) obligate the full utilization of sharks caught by fishery and submission of fishery data. In relation to this resolution, IOTC adopted conservation and management measures for blue sharks in the Indian Ocean, including 1) for frozen product, retain of shark fin weighing over 5% of the total weight of sharks on board is prohibited and in case shark fin and carcass are not landed simultaneously, it is necessary to take measures to ensure that shark fin weight is not over 5% of the total weight of sharks on board, and 2) for fresh product, the removal of shark fin from the body of sharks is prohibited.
(7) Compliance situation of the management measures		
(10) Continuity of the role of the species in the ecosystem		Generally, it is assumed to be one of the top predators.
(11) Effects of illegal trade on the survival of the species		Unknown.
5 When NDF is considered based on the information in paragraph 3 above, as a first step, items iii), v) and vi) of paragraph 3 should be considered in accordance with the following criteria in order. If these three items meet requirements in the criteria, the other items in paragraph 3 also should be considered to judge whether NDF can be made.		
(1) When a TAC of the species is established or calculated on scientific bases, the present total catch of the species including the export is less than the amount of the TAC.		
(2) In case that establishment or calculation of a TAC of the species on scientific bases is difficult, but the stock trend can be estimated for a certain period based on catch or other data, the stock does not show a decreasing trend and the present total catch of the species including the export is less than the average past catch amount of the species. (The length of the period depends on biological characteristic of the species.)		
(3) In case that establishment or calculation of a TAC of the species on scientific bases is difficult and 5. ii) above is not applicable, the stock is considered to be maintained through the management measures which have been introduced or will be introduced in the near future. In making judgment of the effect of the management measures, the following information should be considered: a) Protected areas are effectively established. b) Time closure is effectively established. c) It is estimated that the fishing pressure has been decreased substantially because the number of fishermen to catch the species is regulated and the number has been substantially decreased over a long period. d) Regulation of fishing gear is effectively established. e) Individuals smaller than a certain size are protected. f) Other effective management measures (such as release of females, prohibition of bottom trawl, restriction of power of light and so on) are established.		
(4) In case that establishment or calculation of a TAC of the species on scientific bases is difficult and neither 5. ii) nor iii) is applicable, the annual catch amount of the species is considered negligible against the estimated stock size. In estimating the stock size, the minimum stock size should be estimated, taking into account, inter alia, the past catch record, the area of distribution, the stock size and productivity of look-alike species as well as the catch amount and the maximum fishing efficiency. The "negligible level" should in principle follow the table below, depending on the productivity of the species. When any parameter of the species falls under a less productivity category, the species shall be regarded as belonging to the category.		
(5) The species is considered to be maintained under the present fishing activities because of the stock enhancement activities for the species		
7 For a specific aquatic species, NDF prior to trades within a certain period (hereinafter referred to as comprehensive NDF) can be made when identification of look-alike species is clearly possible or the species meets at least one of the criteria 2(i), 5(i)-(iv) and is considered to be able to make NDF for a certain period. However, when a scientific stock assessment shows that the stock of the species becomes worse etc., the comprehensive NDF may be suspended.		Yes. Blue shark was decided to be listed in Appendix II as look-alike species at the CITES COP19 in 2022. Identification of specimens is clearly possible because they are clearly possible to be identified at the time of catch and/or landing, etc., and copies of all documentation to the transaction of the specimens from the catch or landing to export are provided. In addition, as described above 3(3), the results of stock assessment in the IOTC Working Party of Bycatch and Ecosystem showed that current stock status is not overfished and not overfishing.
Conclusion		NDF can be made.

Parameters	Productivity		
	Low	Middle	High
Natural mortality rate (M)	$M < 0.2$	$0.2 \leq M \leq 0.5$	$0.5 < M$
Intrinsic rate of Natural increase (R)	$R < 0.14$	$0.14 \leq R \leq 0.35$	$0.35 < R$
von Bertalanffy growth rate (K)	$K < 0.15$	$0.15 \leq K \leq 0.33$	$0.33 < K$
Age at maturity (t mat)	$8 < T \text{ mat}$	$3.3 \leq t \text{ mat} \leq 8$	$t \text{ mat} < 3.3$
Maximum age (t max)	$25 < T \text{ max}$	$14 \leq t \text{ max} \leq 25$	$t \text{ max} < 14$
Generation interval (G)	$10 < G$	$5 \leq G \leq 10$	$G < 5$
Negligible level 1 (Recovery Index (Fr)=0.1)	0.7%	1.2-6%	1.8-6%

1 "negligible level" can be calculated as $R \cdot Fr / 2$ by the method of Wade 1998.

2 Median value of R is used as there are ranges.

3 0.35 is used as R

Summary of making non-detriment findings

Species: Blue shark (*Prionace glauca*), North Atlantic Population

2 NDF can be made when the specimen is:		
(1) The specimen is collected before the listing in Appendix.		N/A
(2) The specimen is not a nature origin such as: ① Bred from parents collected before listing in Appendix. ② Bred from parents which were imported under the CITES procedures. ③ Bred from parents which met the requirement of NDF. ④ Others (Bred under a robust technique which was proved to be able to make F2.)		N/A
(3) The specimen is collected from a part of an individual by a method without affecting the survival of the individual (such as a specimen of biopsy sampling, an embryo, spermatozoa and so on).		N/A
(4) The specimen is collected from a dead individual and it is reasonably considered that the death is not attributable to the specimen collector, e.g., a stranded whale. (A by-caught individual is excluded from this category.)		N/A
3 When a specimen does not meet any criterion of paragraph 2 above, NDF should be basically considered, taking into account the following information:		
(1) Biological characteristic and life history of the species		Life span of blue shark is estimated to be over 20 years old. Reproductive system is placental viviparity with mean litter size is 37 for the North Atlantic stock. Length at 50% maturity (fork length) is estimated to be 180.2 cm for males and 171.2 cm for females. Age at maturity is estimated to be in the range between 4-7 years old.
(2) Distribution range of the species (historical and present)		Blue shark is distributed from tropical to temperate waters globally. In particular, high abundance is observed in temperate waters.
(3) Stock structure, status and trend of the species (8) Monitoring of the species status (9) Conservation of the species		Productivity of blue shark is higher than that of other pelagic sharks. The female intrinsic rate of population increase estimated from the Monte Carlo simulation based on matrix population model with consideration of age and uncertainties in the biological parameters (age at maturity, life span, litter size, growth and natural mortality) was 0.31-0.44 per year. This estimate implies that the stock size can increase approximately 1.36-1.55 fold within one year in absence of fishing impacts. In the ICCAT stock assessment meeting in 2015, stock assessments were conducted by Bayesian Surplus Production Model (BSP) and integrated model (Stock Synthesis : SS), using catch and CPUE (Catch per Unit Effort) data. BSP and SS showed that this stock is not likely in overfished condition and overfishing is not occurring. Standing Committee on Research and Statistics (SCRS) evaluated that the stock is not in overfished condition and overfishing is not occurring, but it also pointed out the result of assessments include high uncertainty due to high uncertainty of the input data as well as assumptions of their model structures.
(4) Threats to the species		Bycatch by tuna longline fishery etc.
(5) Historical and present fishing situation and mortality rate of the species (6) Introduced and proposed management measures for the species (7) Compliance situation of the management measures		Japanese deep-set longline fishery targeting bigeye tuna in tropical waters and Japanese shallow-set longline fishery targeting Atlantic bluefin tuna and swordfish in temperate waters catch blue shark as bycatch. Landings of blue shark by Japanese longline vessel calculated from logbook data from 1994 to 2021 range from 270 to 4,500 tons in the North Atlantic. Currently, all tuna Regional Fishery Management Organizations (RFMOs) obligate the full utilization of sharks caught by fishery and submission of fishery data. ICCAT adopted management measures such as Total Allowable Catch (TAC) in the North Atlantic at 39,102 ton (mean catch between 2011 and 2015) including national allocations to main fishing countries (Japan's allocation: 4,010 tons). This catch limit has been implemented since 2020.
(10) Continuity of the role of the species in the ecosystem (11) Effects of illegal trade on the survival of the species		Generally, it is assumed to be one of the top predators. Unknown.
5 When NDF is considered based on the information in paragraph 3 above, as a first step, items (ii), (v) and (vi) of paragraph 3 should be considered in accordance with the following criteria in order. If these three items meet requirements in the criteria, the other items in paragraph 3 also should be considered to judge whether NDF can be made.		
(1) When a TAC of the species is established or calculated on scientific bases, the present total catch of the species including the export is less than the amount of the TAC.		/
(2) In case that establishment or calculation of a TAC of the species on scientific bases is difficult, but the stock trend can be estimated for a certain period based on catch or other data, the stock does not show a decreasing trend and the present total catch of the species including the export is less than the average past catch amount of the species. (The length of the period depends on biological characteristic of the species.)		
(3) In case that establishment or calculation of a TAC of the species on scientific bases is difficult and 5. ii) above is not applicable, the stock is considered to be maintained through the management measures which have been introduced or will be introduced in the near future. In making judgment of the effect of the management measures, the following information should be considered: a) Protected areas are effectively established. b) Time closure is effectively established. c) It is estimated that the fishing pressure has been decreased substantially because the number of fishermen to catch the species is regulated and the number has been substantially decreased over a long period. d) Regulation of fishing gear is effectively established. e) Individuals smaller than a certain size are protected. f) Other effective management measures (such as release of females, prohibition of bottom trawl, restriction of power of light and so on) are established. g) Combination of above mentioned measures brings the same conservation effect.		
(4) In case that establishment or calculation of a TAC of the species on scientific bases is difficult and neither 5. ii) nor iii) is applicable, the annual catch amount of the species is considered negligible against the estimated stock size. In estimating the stock size, the minimum stock size should be estimated, taking into account, inter alia, the past catch record, the area of distribution, the stock size and productivity of look-alike species as well as the catch amount and the maximum fishing efficiency. The "negligible level" should in principle follow the table below, depending on the productivity of the species. When any parameter of the species falls under a less productivity category, the species shall be regarded as belonging to the category.		
(5) The species is considered to be maintained under the present fishing activities because of the stock enhancement activities for the species		
7 For a specific aquatic species, NDF prior to trades within a certain period (hereinafter referred to as comprehensive NDF) can be made when identification of look-alike species is clearly possible or the species meets at least one of the criteria 2(i), 5(i)-(iv), and is considered to be able to make NDF for a certain period. However, when a scientific stock assessment shows that the stock of the species becomes worse etc., the comprehensive NDF may be suspended.		Yes. Blue shark was decided to be listed in Appendix II as look-alike species at the CITES COP19 in 2022. Identification of specimens is clearly possible because they are clearly possible to be identified at the time of catch and/or landing, etc., and copies of all documentation to the transaction of the specimens from the catch or landing to export are provided. In addition, as described above 3(3), SCRS evaluated that this stock was not overfished and that overfishing was not occurring.
Conclusion		NDF can be made.

Parameters	Productivity		
	Low	Middle	High
Natural mortality rate (M)	$M < 0.2$	$0.2 \leq M \leq 0.5$	$0.5 < M$
Intrinsic rate of Natural increase (R)	$R < 0.14$	$0.14 \leq R \leq 0.35$	$0.35 < R$
von Bertalanffy growth rate (K)	$K < 0.15$	$0.15 \leq K \leq 0.33$	$0.33 < K$
Age at maturity (t mat)	$8 < T \text{ mat}$	$3.3 \leq t \text{ mat} \leq 8$	$t \text{ mat} < 3.3$
Maximum age (t max)	$25 < T \text{ max}$	$14 \leq t \text{ max} \leq 25$	$t \text{ max} < 14$
Generation interval (G)	$10 < G$	$5 \leq G \leq 10$	$G < 5$
Negligible level 1 (Recovery Index (Fr)=0.1)	0.7%	1.2% ²	1.8% ³

1 "negligible level" can be calculated as $R \cdot Fr^{1/2}$ by the method of Wade 1998.

2 Median value of R is used as there are ranges.

3 0.35 is used as R

Summary of making non-detriment findings

Species: Blue shark (*Prionace glauca*), South Atlantic Population

2	NDF can be made when the specimen is:	
	(1) The specimen is collected before the listing in Appendix.	N/A
	(2) The specimen is not a nature origin such as: ① Bred from parents collected before listing in Appendix. ② Bred from parents which were imported under the CITES procedures. ③ Bred from parents which met the requirement of NDF. ④ Others (Bred under a robust technique which was proved to be able to make F2.)	N/A
	(3) The specimen is collected from a part of an individual by a method without affecting the survival of the individual (such as a specimen of biopsy sampling, an embryo, spermatozoa and so on).	N/A
	(4) The specimen is collected from a dead individual and it is reasonably considered that the death is not attributable to the specimen collector, e.g., a stranded whale. (A by-caught individual is excluded from this category.)	N/A
3	When a specimen does not meet any criterion of paragraph 2 above, NDF should be basically considered, taking into account the following information:	
	(1) Biological characteristic and life history of the species	Life span of blue shark is estimated to be over 20 years old. Reproductive system is placental viviparity with mean litter size is 37 for the North Atlantic stock. Length at 50% maturity (fork length) is estimated to be 180.2 cm for males and 171.2 cm for females. Age at maturity is estimated to be in the range between 4-7 years old.
	(2) Distribution range of the species (historical and present)	Blue shark is distributed from tropical to temperate waters globally. In particular, high abundance is observed in temperate waters.
	(3) Stock structure, status and trend of the species (8) Monitoring of the species status (9) Conservation of the species	Productivity of blue shark is higher than that of other pelagic sharks. The female intrinsic rate of population increase estimated from the Monte Carlo simulation based on matrix population model with consideration of age and uncertainties in the biological parameters (age at maturity, life span, litter size, growth, and natural mortality) was 0.22-0.34 per year. This estimate implies that the stock size can increase approximately 1.25-1.40 fold within one year in absence of fishing impacts. In the ICCAT stock assessment meeting in 2015, stock assessments were conducted by Bayesian Surplus Production Model (BSP) and Bayesian State-Space Surplus Production Model (SS-BSP), using catch and CPUE (Catch per Unit Effort) data. BSP showed that this stock is not likely in overfished condition and overfishing is not occurring (multiple points are located in the green zone of Kobe plot), but SS-BSP provided the opposite results (two points are located in the red zone of Kobe plot). Stock assessment was conducted for the southern stock based on 6 types of CPUE time-series data of fishing countries. The trends of CPUEs are increasing. Standing Committee on Research and Statistics (SCRS) concluded that the stock status is uncertain, though it also acknowledged that this stock is not in overfished condition, and overfishing is not likely occurring, noting the results of stock assessments include high uncertainty due to high uncertainty of the input data as well as assumptions of their model structure.
	(4) Threats to the species	Bycatch by tuna longline fishery etc.
	(5) Historical and present fishing situation and mortality rate of the species (6) Introduced and proposed management measures for the species (7) Compliance situation of the management measures	Japanese deep-set longline fishery targeting bigeye tuna in tropical waters and Japanese shallow-set longline fishery targeting Atlantic bluefin tuna in temperate waters catch blue shark as bycatch. Landings of blue shark by Japanese longline vessel calculated from logbook data from 1994 to 2021 range from 180 to 3,500 tons in the North Atlantic. Currently, all tuna Regional Fishery Management Organizations (RFMOs) obligate the full utilization of sharks caught by fishery and submission of fishery data. ICCAT adopted management measures such as Total Allowable Catch (TAC) in the whole South Atlantic stock at 28,923 tons (no allocations to each country). This catch limit has been implemented since 2020.
	(10) Continuity of the role of the species in the ecosystem (11) Effects of illegal trade on the survival of the species	Generally, it is assumed to be one of the top predators. Unknown.
5	When NDF is considered based on the information in paragraph 3 above, as a first step, items iii), v) and vi) of paragraph 3 should be considered in accordance with the following criteria in order. If these three items meet requirements in the criteria, the other items in paragraph 3 also should be considered to judge whether NDF can be made.	
	(1) When a TAC of the species is established or calculated on scientific bases, the present total catch of the species including the export is less than the amount of the TAC.	/
	(2) In case that establishment or calculation of a TAC of the species on scientific bases is difficult, but the stock trend can be estimated for a certain period based on catch or other data, the stock does not show a decreasing trend and the present total catch of the species including the export is less than the average past catch amount of the species. (The length of the period depends on biological characteristic of the species.)	
	(3) In case that establishment or calculation of a TAC of the species on scientific bases is difficult and 5. ii) above is not applicable, the stock is considered to be maintained through the management measures which have been introduced or will be introduced in the near future. In making judgment of the effect of the management measures, the following information should be considered: a) Protected areas are effectively established. b) Time closure is effectively established. c) It is estimated that the fishing pressure has been decreased substantially because the number of fishermen to catch the species is regulated and the number has been substantially decreased over a long period. d) Regulation of fishing gear is effectively established. e) Individuals smaller than a certain size are protected. f) Other effective management measures (such as release of females, prohibition of bottom trawl, restriction of power of light and so on) are established.	
	(4) In case that establishment or calculation of a TAC of the species on scientific bases is difficult and neither 5. ii) nor iii) is applicable, the annual catch amount of the species is considered negligible against the estimated stock size. In estimating the stock size, the minimum stock size should be estimated, taking into account, inter alia, the past catch record, the area of distribution, the stock size and productivity of look-alike species as well as the catch amount and the maximum fishing efficiency. The "negligible level" should in principle follow the table below, depending on the productivity of the species. When any parameter of the species falls under a less productivity category, the species shall be regarded as belonging to the category.	
	(5) The species is considered to be maintained under the present fishing activities because of the stock enhancement activities for the species	
7	For a specific aquatic species, NDF prior to trades within a certain period (hereinafter referred to as comprehensive NDF) can be made when identification of look-alike species is clearly possible or the species meets at least one of the criteria 2(i), 5(i)-(iv), and is considered to be able to make NDF for a certain period. However, when a scientific stock assessment shows that the stock of the species becomes worse etc., the comprehensive NDF may be suspended.	Yes. Blue shark was decided to be listed in Appendix II as look-alike species at the CITES COP19 in 2022. Identification of specimens is clearly possible because they are clearly possible to be identified at the time of catch and/or landing, etc., and copies of all documentation to the transaction of the specimens from the catch or landing to export are provided. In addition, as described above 3(3), SCRS acknowledged that this stock was not overfished and overfishing was not likely occurring, noting that the stock status is uncertain.
Conclusion		NDF can be made.

Parameters	Productivity		
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¹ "negligible level" can be calculated as $R * Fr/2$ by the method of Wade 1998.

² Median value of R is used as there are ranges.

³ 0.35 is used as R