Development of a “Draft list of shark species under the purview of the IATTC”

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Document SAC-15-10

Outline

- Resolution C-23-07 (Conservation Measures for the Protection and Sustainable Management of Sharks) calls for staff consultation with EBWG and SAC on two
- Paragraph 13 - Development of a draft list of shark species under the purview of the IATTC
- Paragraph 14 - Implement a data collection program for sharks
- Ideally come away from EBWG with a recommendation to SAC

Ecological sustainability

- IATTC mandated to ensure ecologically sustainability of its fisheries

To ensure the "*long-term conservation and sustainable use of the stocks of tunas and tuna-like species and other associated species of fish taken by vessels fishing for tunas and tuna-like species in the eastern Pacific Ocean (EPO)*"

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Article VII. "…*adopt, as necessary, conservation and management measures and recommendations for species belonging to the same ecosystem and that are affected by fishing for, or dependent on or associated with, the fish stocks covered by this Convention, with a view to maintaining or restoring populations of such species above levels at which their reproduction may become seriously threatened*"

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- Difficult, given the IATTC has not adopted a prescriptive list of shark species

Resolution C-23-07

- **Resolution C-23-07 - Conservation Measures for the Protection and Sustainable Management of Sharks**

13. "*In 2024, the IATTC scientific staff, in consultation with the IATTC SAC and EBWG, shall develop a draft list of shark species under the purview of the Commission in the Convention Area for its consideration*"

IATTC shark vulnerability assessments

- The staff has been proactive in assessing shark vulnerability
- In 2022, IATTC undertook a vulnerability assessment for all shark species impacted by 8 EPO fisheries (SAC-13-11)
  - Industrial longline
  - Purse seine (Class 6) – NOA, OBJ, DEL
  - Purse seine (Class 1-5) – NOA, OBJ
  - Artisanal longline
  - Artisanal gillnet

IATTC shark vulnerability assessments

- 49 species identified to interact with IATTC fisheries

Code	Species	Common name	Industrial longline	PS-C6 (DEL)	PS-C6 (NOA)	PS-C6 (OBJ)	PS-C1-5 (NOA)	PS-C1-5 (OBJ)	Artisanal gillnet/ longline	Artisanal longline	Total
BSH	*Prionace glauca*	Blue shark	168621	198	534	340	3	46	4	6228	175974
FAL	*Carcharhinus falciformis*	Silky shark	13440	5761	2722	55272	4	5	484	5335	83023
SMA	*Isurus oxyrinchus*	Shortfin mako shark	18492	48	445	614	6	7		1973	21585
PSK	*Pseudocarcharias kamoharai*	Crocodile shark	17760						2	26	17788
OCS	*Carcharhinus longimanus*	Oceanic whitetip shark	4223	616	324	9977	2	54		49	15245
BTH	*Alopias superciliosus*	Bigeye thresher	8111	621	710	213	8	1	29	241	9934
PTH	*Alopias pelagicus*	Pelagic thresher	6075	515	506	221	11	8	94	2319	9749
SPL	*Sphyrna lewini*	Scalloped hammerhead shark	583	331	476	1851	33	55	1009	762	5100
SPZ	*Sphyrna zygaena*	Smooth hammerhead shark	2340	194	338	1971	15	51	2	76	4987
SSQ	*Zameus squamulosus*	Velvet dogfish	3038								3038
ALV	*Alopias vulpinus*	Common thresher	290	155	216	59	4		99	53	876
CCL	*Carcharhinus limbatus*	Blacktip shark	285	78	24	35	1	1	97	338	859
LMA	*Isurus paucus*	Longfin mako shark	671								671
SPK	*Sphyrna mokarran*	Great hammerhead	72	35	42	213	2	3		68	435
CCG	*Carcharhinus galapagensis*	Galapagos shark	203		5	17			1		226
BRO	*Carcharhinus brachyurus*	Copper shark	8	22	24	114					168
CNX	*Nasolamia velox*	Whitenose shark	43	2	1			5	18	92	161
RHU	*Rhizoprionodon longurio*	Pacific sharpnose shark		1	3				140	5	149
CCE	*Carcharhinus leucas*	Bull shark	2	14	21	17	2		25	39	120
TIG	*Galeocerdo cuvier*	Tiger shark	56		5	1			18	24	104
POR	*Lamna nasus*	Porbeagle	88								88
DUS	*Carcharhinus obscurus*	Dusky shark	45	2	15	10					72
ISB	*Isistius brasiliensis*	Cookie cutter shark	66								66
RHN	*Rhincodon typus*	Whale shark	1		30	29		2			62
SCK	*Dalatias licha*	Kitefin shark	60								60
LMD	*Lamna ditropis*	Salmon shark	43								43
CCR	*Carcharhinus porosus*	Smalltail shark		3		30			5		38
CCP	*Carcharhinus plumbeus*	Sandbar shark		7	18	7					32
CCA	*Carcharhinus altimus*	Bignose shark		3		24					27
SSN	*Sphyrna corona*	Scalloped bonnethead	2	2	5	5			4	4	22
SPE	*Sphyrna media*	Scoophead		1	4	13				2	20
MUU	*Mustelus lunulatus*	Sicklefin smooth-hound							7	12	19
GAG	*Galeorhinus galeus*	Tope shark	19								19
CXP	*Cynopterus coniceps*	Longnose velvet dogfish	18								18
GNC	*Ginglymostoma cirratum*	Nurse shark							2	13	15
CTK	*Mustelus henlei*	Brown smooth-hound							1	14	15
ODH	*Odontaspis noronhai*	Bigeye sand tiger shark	9								9
WSH	*Carcharodon carcharias*	Great white shark	6		1						7
SUC	*Squatina californica*	Pacific angelshark	4								4
CCT	*Carcharias taurus*	Sand tiger shark	3								3
CCQ	*Carcharhinus sorrah*	Spottail shark	2								2
CTD	*Mustelus dorsalis*	Sharptooth smooth-hound							2		2
DGS	*Squalus acanthias*	Picked/Spiny dogfish	2								2
NGB	*Negaprion brevirostris*	Lemon shark		1	1						2
SPJ	*Sphyrna tiburo*	Bonnethead			1	1					2
ALS	*Carcharhinus albimarginatus*	Silvertip shark								1	1
BSK	*Cetorhinus maximus*	Basking shark			1						1
QYW	*Squalus suckleyi*	Spotted spiny dogfish	1								1
TRB	*Triaenodon obesus*	Whitetip reef shark							1		1

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- 32 species formally assessed using EASI-Fish

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DGS	*Squalus acanthias*	Picked/Spiny dogfish	2								2
NGB	*Negaprion brevirostris*	Lemon shark		1	1						2
SPJ	*Sphyrna tiburo*	Bonnethead			1	1					2
ALS	*Carcharhinus albimarginatus*	Silvertip shark								1	1
BSK	*Cetorhinus maximus*	Basking shark			1						1
QYW	*Squalus suckleyi*	Spotted spiny dogfish	1								1
TRB	*Triaenodon obesus*	Whitetip reef shark							1		1

IATTC shark vulnerability assessments

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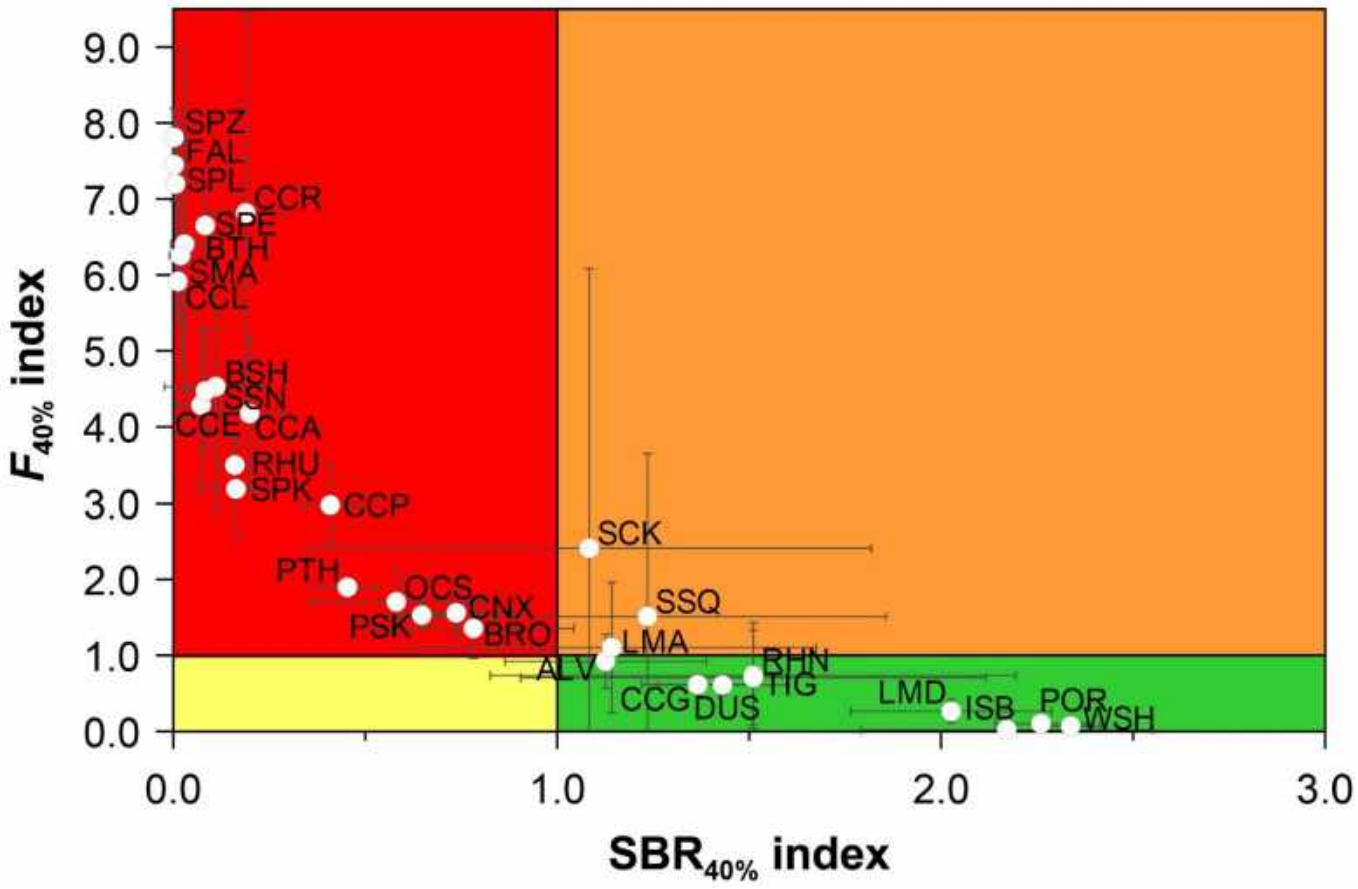
  - 20 classified as “most vulnerable”



IATTC shark vulnerability assessments

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- 32 species formally assessed using EASI-Fish
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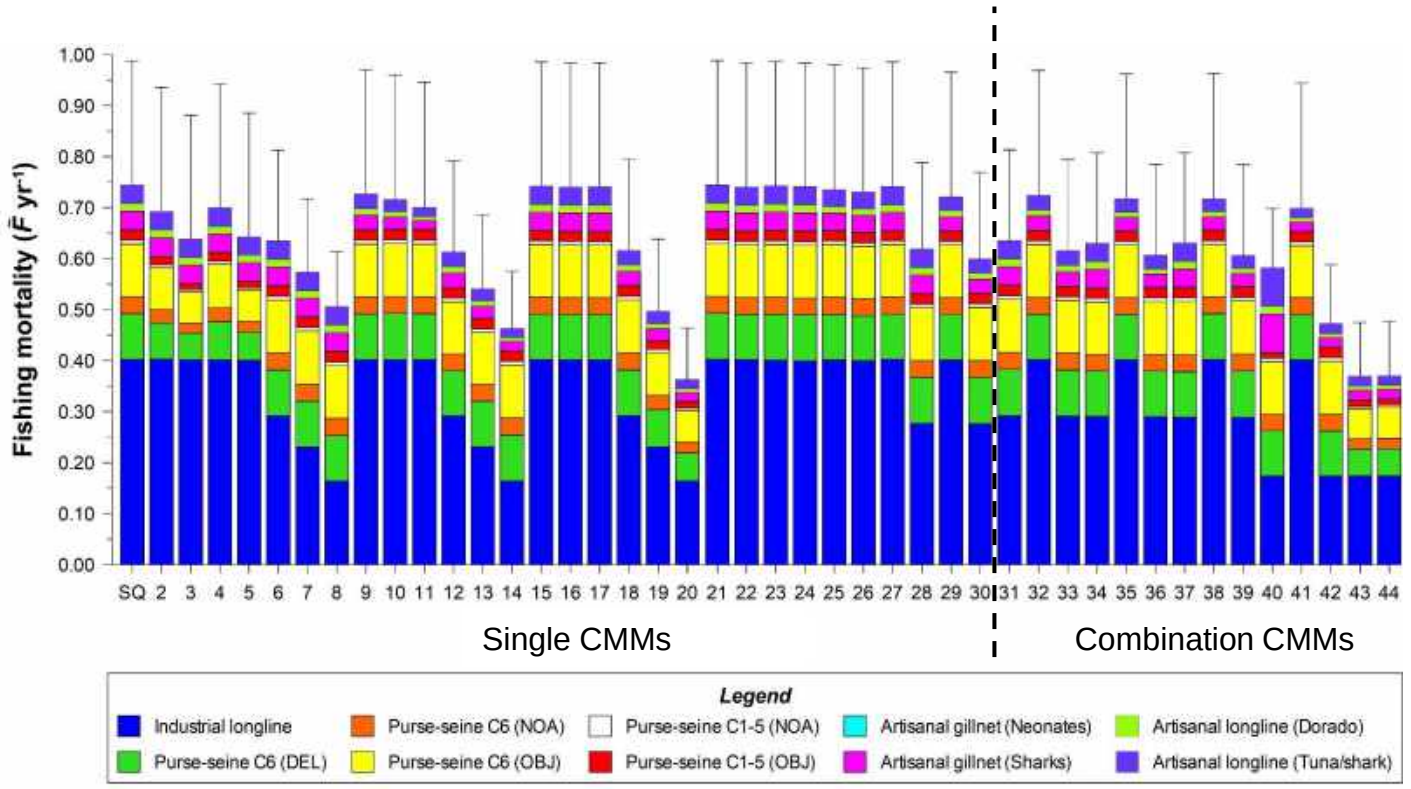
- Silky shark and 3 hammerhead species among most vulnerable and were then the focus of EASI-Fish assessments to test CMMs (SAC-14-12)



Developing a draft list of species

- 49 ‘impacted’ species classified by:
  - Ecological traits

Family	Species	Geographical distribution	Habitat	Endemic to EPO
Alopiidae	*Alopias pelagicus*	Oceanic	Pelagic	No
Alopiidae	*Alopias superciliosus*	Neritic/Oceanic	Pelagic	No
Alopiidae	*Alopias vulpinus*	Neritic/Oceanic	Pelagic	No
Carcharhinidae	*Carcharhinus albimarginatus*	Neritic/Oceanic	Pelagic	No
Carcharhinidae	*Carcharhinus altimus*	Neritic	Demersal	No
Carcharhinidae	*Carcharhinus brachyurus*	Neritic/Oceanic	Pelagic	No
Carcharhinidae	*Carcharhinus falciformis*	Oceanic	Pelagic	No
Carcharhinidae	*Carcharhinus galapagensis*	Neritic/Oceanic	Pelagic	No
Carcharhinidae	*Carcharhinus leucas*	Neritic	Pelagic	No
Carcharhinidae	*Carcharhinus limbatus*	Neritic	Demersal	No
Carcharhinidae	*Carcharhinus longimanus*	Oceanic	Pelagic	No
Carcharhinidae	*Carcharhinus obscurus*	Neritic	Demersal	No
Carcharhinidae	*Carcharhinus plumbeus*	Neritic	Demersal	No
Carcharhinidae	*Carcharhinus porosus*	Neritic	Demersal	Yes
Carcharhinidae	*Carcharhinus sorrah*	Neritic	Benthopelagic	No
Carcharhinidae	*Carcharias taurus*	Neritic	Demersal	No

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- 49 ‘impacted’ species classified by:
  - Ecological traits
  - Existing IATTC Resolution(s)

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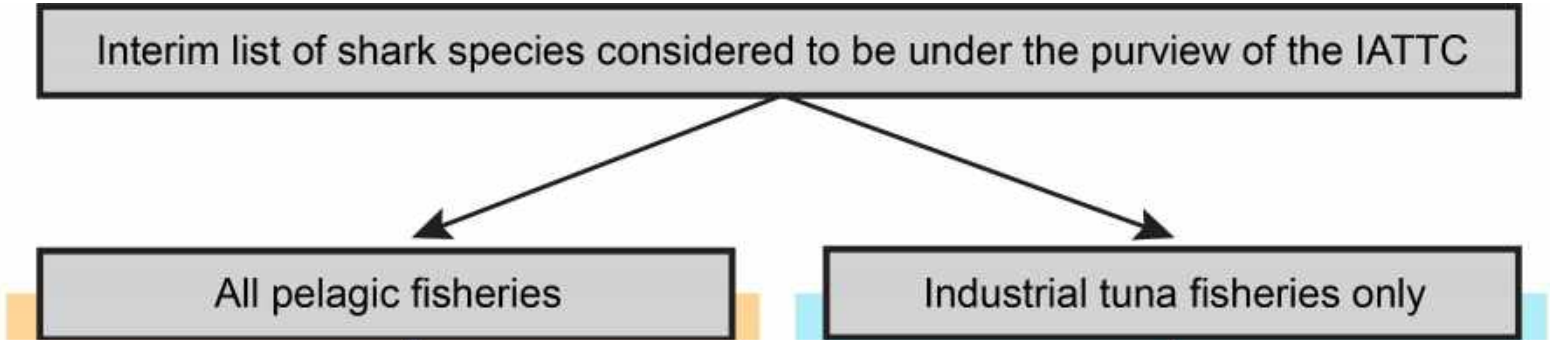
Alopiidae	*Alopias pelagicus*	Oceanic	Pelagic	No	No
Alopiidae	*Alopias superciliosus*	Neritic/Oceanic	Pelagic	No	No
Alopiidae	*Alopias vulpinus*	Neritic/Oceanic	Pelagic	No	No
Carcharhinidae	*Carcharhinus albimarginatus*	Neritic/Oceanic	Pelagic	No	No
Carcharhinidae	*Carcharhinus altimus*	Neritic	Demersal	No	No
Carcharhinidae	*Carcharhinus brachyurus*	Neritic/Oceanic	Pelagic	No	No
Carcharhinidae	*Carcharhinus falciformis*	Oceanic	Pelagic	No	Yes
Carcharhinidae	*Carcharhinus galapagensis*	Neritic/Oceanic	Pelagic	No	No
Carcharhinidae	*Carcharhinus leucas*	Neritic	Pelagic	No	No
Carcharhinidae	*Carcharhinus limbatus*	Neritic	Demersal	No	No
Carcharhinidae	*Carcharhinus longimanus*	Oceanic	Pelagic	No	Yes
Carcharhinidae	*Carcharhinus obscurus*	Neritic	Demersal	No	No
Carcharhinidae	*Carcharhinus plumbeus*	Neritic	Demersal	No	No
Carcharhinidae	*Carcharhinus porosus*	Neritic	Demersal	Yes	No
Carcharhinidae	*Carcharhinus sorrah*	Neritic	Benthopelagic	No	No
Carcharhinidae	*Carcharias taurus*	Neritic	Demersal	No	No

Developing a draft list of species

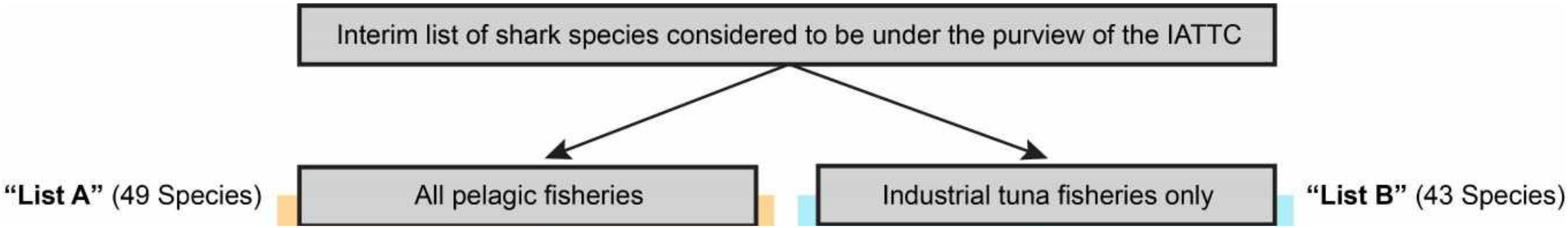
- 49 ‘impacted’ species classified by:
  - Ecological traits
  - Existing IATTC Resolution(s)
  - Conservation status – IUCN “CR” or “EN”, or CITES Appendix II

Family	Species	Geographical distribution	Habitat	Endemic to EPO	IATTC Resolution	IUCN classification	CITES Appendix II
Alopiidae	*Alopias pelagicus*	Oceanic	Pelagic	No	No	EN	Yes
Alopiidae	*Alopias superciliosus*	Neritic/Oceanic	Pelagic	No	No	VU	Yes
Alopiidae	*Alopias vulpinus*	Neritic/Oceanic	Pelagic	No	No	VU	Yes
Carcharhinidae	*Carcharhinus albimarginatus*	Neritic/Oceanic	Pelagic	No	No	VU	Yes
Carcharhinidae	*Carcharhinus altimus*	Neritic	Demersal	No	No	NT	Yes
Carcharhinidae	*Carcharhinus brachyurus*	Neritic/Oceanic	Pelagic	No	No	VU	Yes
Carcharhinidae	*Carcharhinus falciformis*	Oceanic	Pelagic	No	Yes	VU	Yes
Carcharhinidae	*Carcharhinus galapagensis*	Neritic/Oceanic	Pelagic	No	No	LC	Yes
Carcharhinidae	*Carcharhinus leucas*	Neritic	Pelagic	No	No	VU	Yes
Carcharhinidae	*Carcharhinus limbatus*	Neritic	Demersal	No	No	VU	Yes
Carcharhinidae	*Carcharhinus longimanus*	Oceanic	Pelagic	No	Yes	CR	Yes
Carcharhinidae	*Carcharhinus obscurus*	Neritic	Demersal	No	No	EN	Yes
Carcharhinidae	*Carcharhinus plumbeus*	Neritic	Demersal	No	No	EN	Yes
Carcharhinidae	*Carcharhinus porosus*	Neritic	Demersal	Yes	No	CR	Yes
Carcharhinidae	*Carcharhinus sorrah*	Neritic	Benthopelagic	No	No	NT	Yes
Carcharhinidae	*Carcharias taurus*	Neritic	Demersal	No	No	CR	Yes

Potential species lists

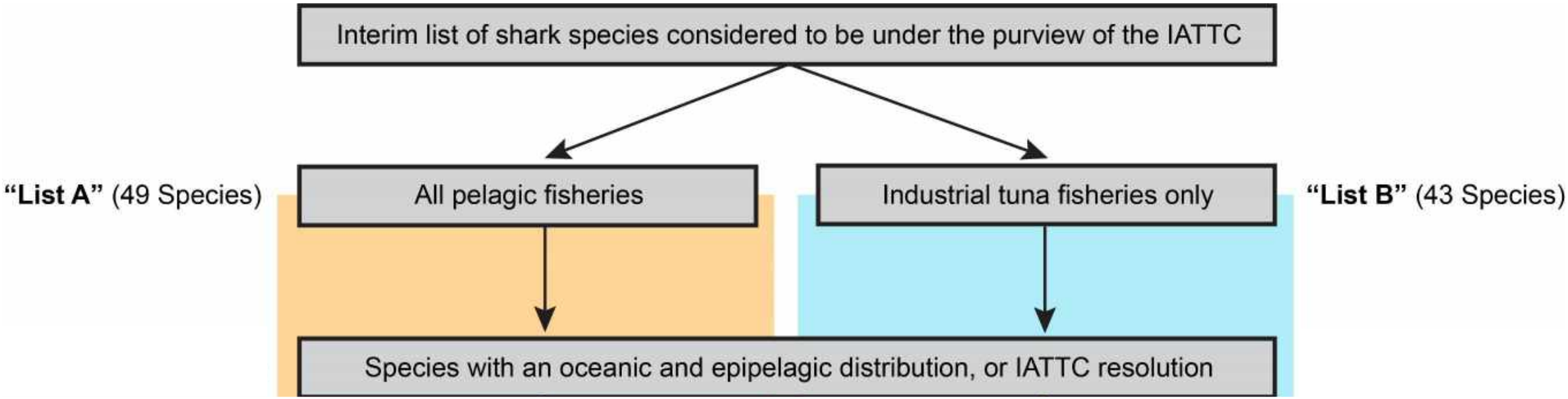


Potential species lists



Includes many neritic and/or demersal species rarely caught by tuna fleets

Potential species lists



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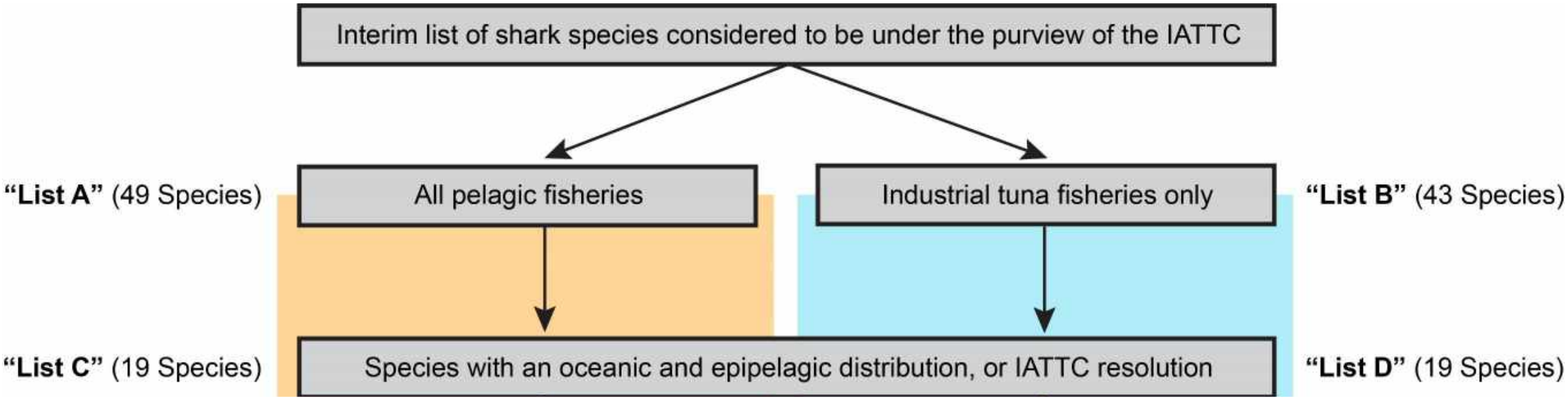
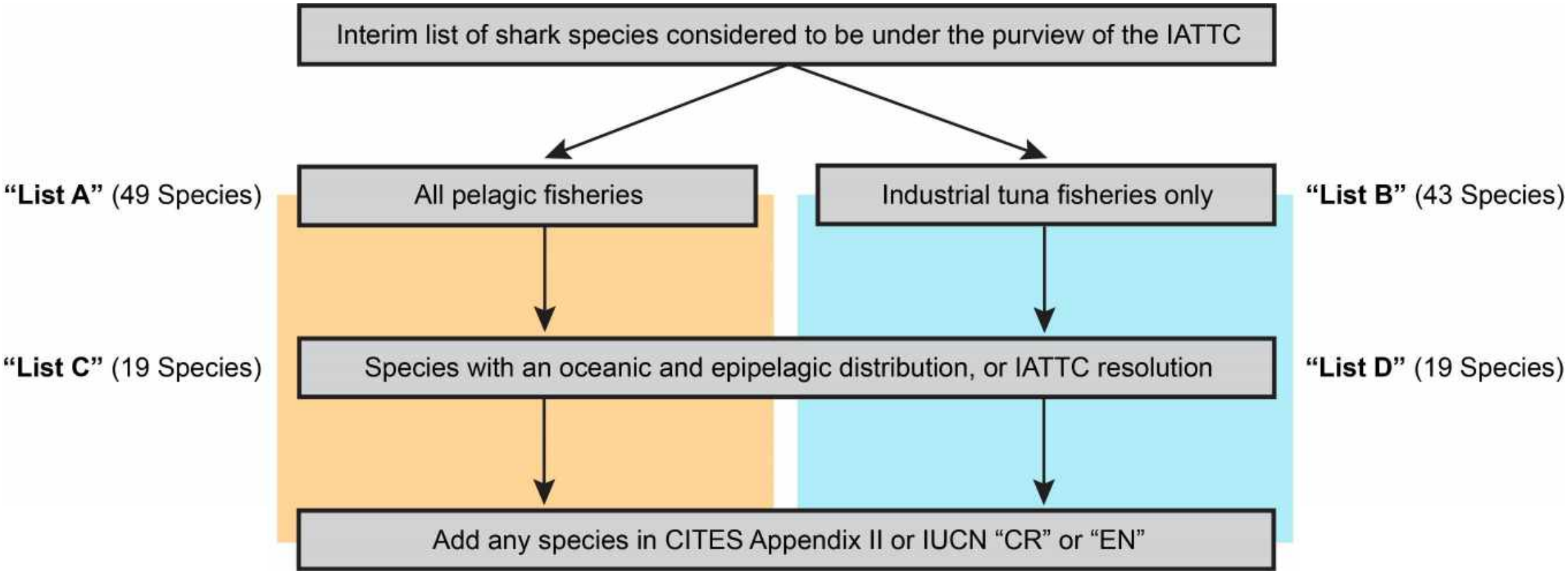


Excludes species of conservation concern where even a few mortalities by IATTC fleets may be biologically significant

Potential species lists



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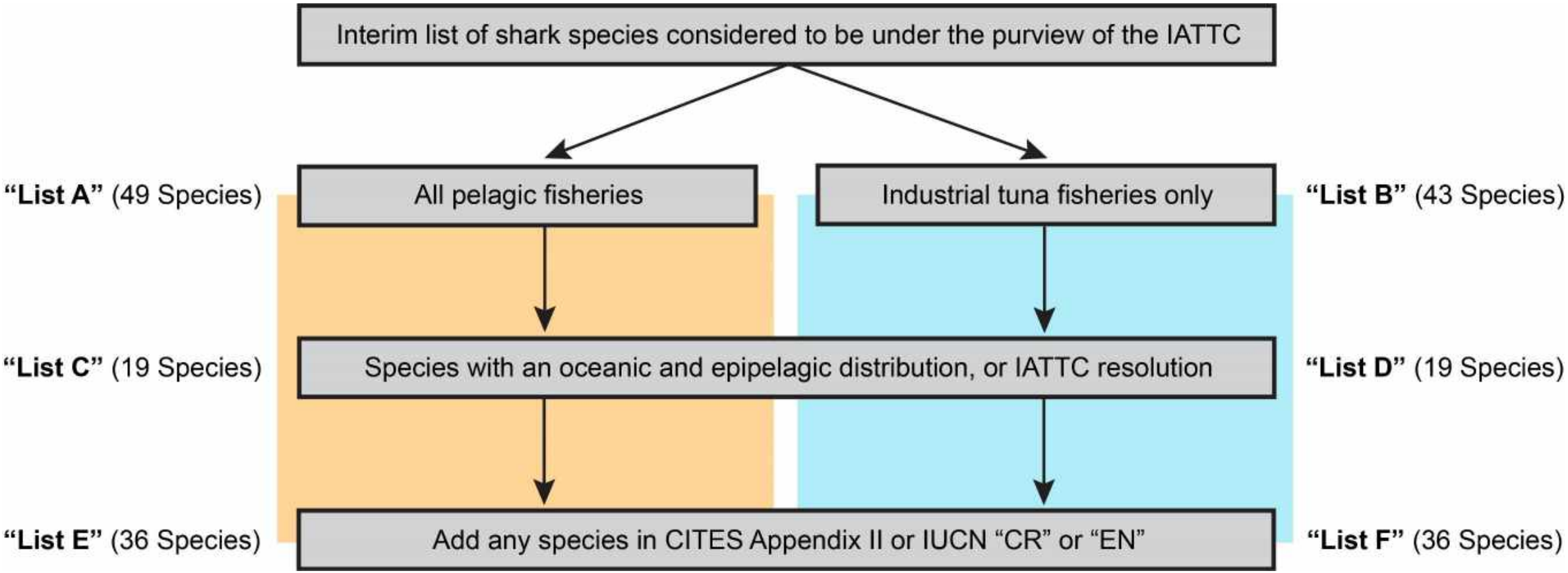

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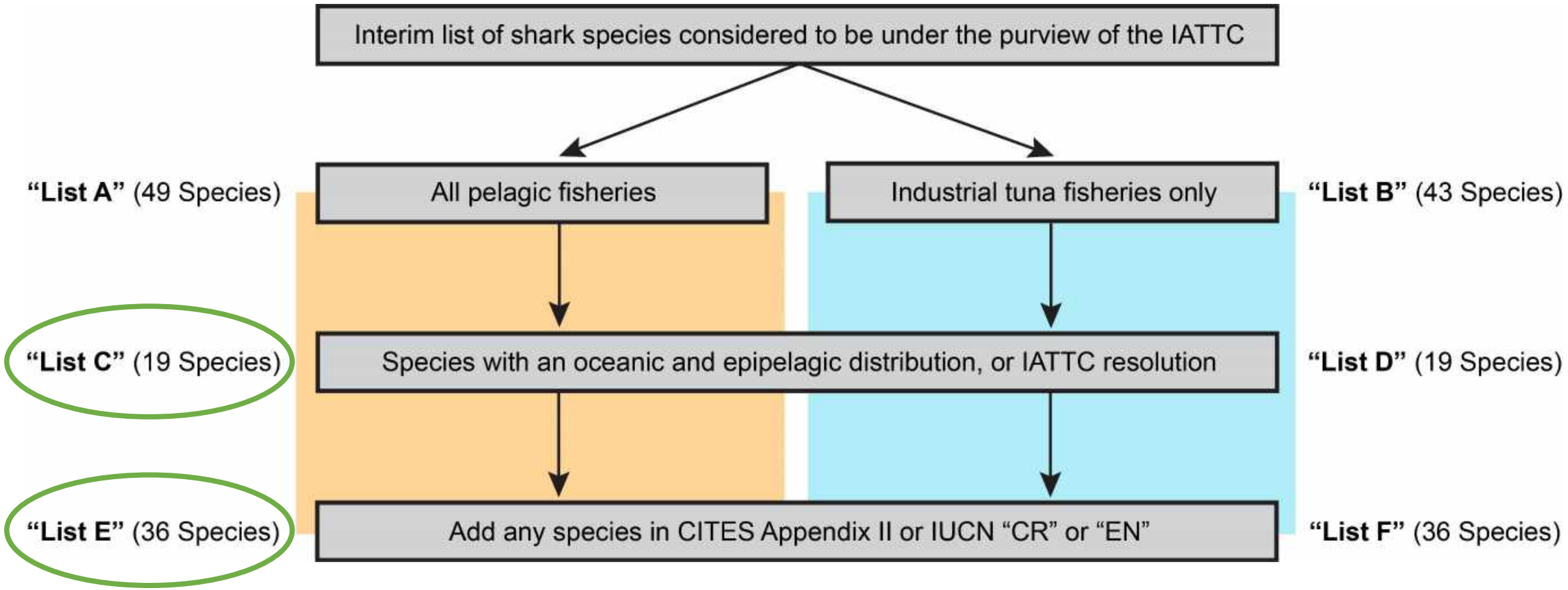

Comparisons with existing lists

Family	Species	Common name	List C	List E
Alopiidae	*Alopias pelagicus*	Pelagic thresher	■	■
Alopiidae	*Alopias superciliosus*	Bigeye thresher	■	■
Alopiidae	*Alopias vulpinus*	Common thresher	■	■
Carcharhinidae	*Carcharhinus albimarginatus*	Silvertip shark		■
Carcharhinidae	*Carcharhinus altimus*	Bignose shark		■
Carcharhinidae	*Carcharhinus brachyurus*	Copper shark	■	■
Carcharhinidae	*Carcharhinus falciformis*	Silky shark	■	■
Carcharhinidae	*Carcharhinus galapagensis*	Galapagos shark	■	■
Carcharhinidae	*Carcharhinus leucas*	Bull shark		■
Carcharhinidae	*Carcharhinus limbatus*	Blacktip shark		■
Carcharhinidae	*Carcharhinus longimanus*	Oceanic whitetip shark	■	■
Carcharhinidae	*Carcharhinus obscurus*	Dusky shark		■
Carcharhinidae	*Carcharhinus plumbeus*	Sandbar shark		■
Carcharhinidae	*Carcharhinus porosus*	Smalltail shark		■
Carcharhinidae	*Carcharias taurus*	Sand tiger shark		■
Carcharhinidae	*Carcharhinus sorrah*	Spottail shark		■
Carcharhinidae	*Nasolamia velox*	Whitenose shark		■
Carcharhinidae	*Negaprion brevirostris*	Lemon shark		■
Carcharhinidae	*Prionace glauca*	Blue shark	■	■
Carcharhinidae	*Rhizoprionodon longurio*	Pacific sharpnose shark		■
Carcharhinidae	*Triaenodon obesus*	Whitetip reef shark		■
Cetorhinidae	*Cetorhinus maximus*	Basking shark	■	■
Dalatiidae	*Dalatias licha*	Kitefin shark		
Dalatiidae	*Isistius brasiliensis*	Cookie cutter shark		
Galeocerdonidae	*Galeocerdo cuvier*	Tiger shark	■	■
Ginglymostomatidae	*Ginglymostoma cirratum*	Nurse shark		
Lamnidae	*Carcharodon carcharias*	Great white shark	■	■
Lamnidae	*Isurus oxyrinchus*	Shortfin mako shark	■	■
Lamnidae	*Isurus paucus*	Longfin mako shark	■	■
Lamnidae	*Lamna ditropis*	Salmon shark	■	■
Lamnidae	*Lamna nasus*	Porbeagle shark	■	■
Mutaenesocidae	*Cynoponticus coniceps*	Longnose velvet dogfish		
Odontaspididae	*Odontaspis noronhai*	Bigeye sand tiger shark		
Pseudocarchariidae	*Pseudocarcharias kamoharai*	Crocodile shark		
Rhincodontidae	*Rhincodon typus*	Whale shark	■	■
Somniosidae	*Zameus squamulosus*	Velvet dogfish		
Sphyrnidae	*Sphyrna corona*	Scalloped bonnethead		■
Sphyrnidae	*Sphyrna lewini*	Scalloped hammerhead	■	■
Sphyrnidae	*Sphyrna media*	Scoophead		■
Sphyrnidae	*Sphyrna mokarran*	Great hammerhead	■	■
Sphyrnidae	*Sphyrna tiburo*	Bonnethead		■
Sphyrnidae	*Sphyrna zygaena*	Smooth hammerhead	■	■
Squalidae	*Squalus suckleyi*	Spotted spiny dogfish		
Squalidae	*Squalus acanthias*	Picked/Spiny dogfish		
Squatinidae	*Squatina californica*	Pacific angelshark		
Triakidae	*Galeorhinus galeus*	Tope shark		■
Triakidae	*Mustelus dorsalis*	Sharptooth smooth-hound		
Triakidae	*Mustelus henlei*	Brown smooth-hound		
Triakidae	*Mustelus lunulatus*	Sicklefin smooth-hound		

Comparisons with existing lists

Family	Species	Common name	List C	List E	UNCLOS Annex I
Alopiidae	*Alopias pelagicus*	Pelagic thresher	■	■	■
Alopiidae	*Alopias superciliosus*	Bigeye thresher	■	■	■
Alopiidae	*Alopias vulpinus*	Common thresher	■	■	■
Carcharhinidae	*Carcharhinus albimarginatus*	Silvertip shark		■	■
Carcharhinidae	*Carcharhinus altimus*	Bignose shark		■	■
Carcharhinidae	*Carcharhinus brachyurus*	Copper shark	■	■	■
Carcharhinidae	*Carcharhinus falciformis*	Silky shark	■	■	■
Carcharhinidae	*Carcharhinus galapagensis*	Galapagos shark	■	■	■
Carcharhinidae	*Carcharhinus leucas*	Bull shark		■	■
Carcharhinidae	*Carcharhinus limbatus*	Blacktip shark		■	■
Carcharhinidae	*Carcharhinus longimanus*	Oceanic whitetip shark	■	■	■
Carcharhinidae	*Carcharhinus obscurus*	Dusky shark		■	■
Carcharhinidae	*Carcharhinus plumbeus*	Sandbar shark		■	■
Carcharhinidae	*Carcharhinus porosus*	Smalltail shark		■	■
Carcharhinidae	*Carcharias taurus*	Sand tiger shark		■	■
Carcharhinidae	*Carcharhinus sorrah*	Spottail shark		■	■
Carcharhinidae	*Nasolamia velox*	Whitenose shark		■	■
Carcharhinidae	*Negaprion brevirostris*	Lemon shark		■	■
Carcharhinidae	*Prionace glauca*	Blue shark	■	■	■
Carcharhinidae	*Rhizoprionodon longurio*	Pacific sharpnose shark		■	■
Carcharhinidae	*Triaenodon obesus*	Whitetip reef shark		■	■
Cetorhinidae	*Cetorhinus maximus*	Basking shark	■	■	■
Dalatiidae	*Dalatias licha*	Kitefin shark			
Dalatiidae	*Isistius brasiliensis*	Cookie cutter shark			
Galeocerdonidae	*Galeocerdo cuvier*	Tiger shark	■	■	
Ginglymostomatidae	*Ginglymostoma cirratum*	Nurse shark			
Lamnidae	*Carcharodon carcharias*	Great white shark	■	■	■
Lamnidae	*Isurus oxyrinchus*	Shortfin mako shark	■	■	■
Lamnidae	*Isurus paucus*	Longfin mako shark	■	■	■
Lamnidae	*Lamna ditropis*	Salmon shark	■	■	■
Lamnidae	*Lamna nasus*	Porbeagle shark	■	■	■
Mustelidae	*Cynoponticus coniceps*	Longnose velvet dogfish			
Odontaspididae	*Odontaspis noronhai*	Bigeye sand tiger shark			
Pseudocarchariidae	*Pseudocarcharias kamoharai*	Crocodile shark			
Rhincodontidae	*Rhincodon typus*	Whale shark	■	■	■
Somniosidae	*Zameus squamulosus*	Velvet dogfish			
Sphyrnidae	*Sphyrna corona*	Scalloped bonnethead		■	■
Sphyrnidae	*Sphyrna lewini*	Scalloped hammerhead	■	■	■
Sphyrnidae	*Sphyrna media*	Scoophead		■	■
Sphyrnidae	*Sphyrna mokarran*	Great hammerhead	■	■	■
Sphyrnidae	*Sphyrna tiburo*	Bonnethead		■	■
Sphyrnidae	*Sphyrna zygaena*	Smooth hammerhead	■	■	■
Squalidae	*Squalus suckleyi*	Spotted spiny dogfish			
Squalidae	*Squalus acanthias*	Picked/Spiny dogfish			
Squatinidae	*Squatina californica*	Pacific angelshark			
Triakidae	*Galeorhinus galeus*	Tope shark		■	
Triakidae	*Mustelus dorsalis*	Sharptooth smooth-hound			
Triakidae	*Mustelus henlei*	Brown smooth-hound			
Triakidae	*Mustelus lunulatus*	Sicklefin smooth-hound			

- UNCLOS Annex 1 in Preamble of Antigua Convention
- Similar species composition as **List E**

ANNEX I. HIGHLY MIGRATORY SPECIES

1. Albacore tuna: Thunnus alalunga.
2. Bluefin tuna: Thunnus thynnus.
3. Bigeye tuna: Thunnus obesus.
4. Skipjack tuna: Katsuwonus pelamis.
5. Yellowfin tuna: Thunnus albacares.
6. Blackfin tuna: Thunnus atlanticus.
7. Little tuna: Euthynnus alletteratus; Euthynnus affnis.
8. Southern bluefin tuna: Thunnus maccoyii.
9. Frigate mackerel: Auxis thazard; Auxis rochei.
10. Pomfrets: Family Bramidae.
11. Marlins: Tetrapturus angustirostris; Tetrapturus belone; Tetrapturus pfluegeri; Tetrapturus albidus; Tetrapturus audax; Tetrapturus georgei; Makaira mazara; Makaira indica; Makaira nigricans.
12. Sail-fishes: Istiophorus platypterus; istiophorus albicans.
13. Swordfish: Xiphias gladius.
14. Sauries: Scomberesox saurus; Cololabis saira; Cololabis adocetus; Scomberesox saurus scombroides.
15. Dolphin: Coryphaena hippurus; Coryphaena equiselis.
16. Oceanic sharks: Hexanchus griseus; Cetorhinus maximus; Family Alopiidae; Rhincodon typus; Family Carcharhinidae; Family Sphyrnidae; Family Isurida.
17. Cetaceans: Family Physeteridae, Family Balaenopteridae; Family Balaenidae; Family Eschrichtiidae; Family Monodontidae; Family Ziphiidae; Family Delphinidae.

Comparisons with existing lists

Family	Species	Common name	List C	List E	UNCLOS Annex I
Alopiidae	*Alopias pelagicus*	Pelagic thresher	■	■	■
Alopiidae	*Alopias superciliosus*	Bigeye thresher	■	■	■
Alopiidae	*Alopias vulpinus*	Common thresher	■	■	■
Carcharhinidae	*Carcharhinus albimarginatus*	Silvertip shark		■	■
Carcharhinidae	*Carcharhinus altimus*	Bignose shark		■	■
Carcharhinidae	*Carcharhinus brachyurus*	Copper shark	■	■	■
Carcharhinidae	*Carcharhinus falciformis*	Silky shark	■	■	■
Carcharhinidae	*Carcharhinus galapagensis*	Galapagos shark	■	■	■
Carcharhinidae	*Carcharhinus leucas*	Bull shark		■	■
Carcharhinidae	*Carcharhinus limbatus*	Blacktip shark		■	■
Carcharhinidae	*Carcharhinus longimanus*	Oceanic whitetip shark	■	■	■
Carcharhinidae	*Carcharhinus obscurus*	Dusky shark		■	■
Carcharhinidae	*Carcharhinus plumbeus*	Sandbar shark		■	■
Carcharhinidae	*Carcharhinus porosus*	Smalltail shark		■	■
Carcharhinidae	*Carcharias taurus*	Sand tiger shark		■	■
Carcharhinidae	*Carcharhinus terra*	Spottail shark		■	■
Carcharhinidae	*Nasolamia velox*	Whitenose shark		■	■
Carcharhinidae	*Negaprion brevirostris*	Lemon shark		■	■
Carcharhinidae	*Prionace glauca*	Blue shark	■	■	■
Carcharhinidae	*Rhizoprionodon longurio*	Pacific sharpnose shark		■	■
Carcharhinidae	*Triaenodon obesus*	Whitetip reef shark		■	■
Cetorhinidae	*Cetorhinus maximus*	Basking shark	■	■	■
Dalatiidae	*Dalatias licha*	Kitefin shark			
Dalatiidae	*Isistius brasiliensis*	Cookie cutter shark			
Galeocerdonidae	*Galeocerdo cuvier*	Tiger shark	■	■	
Ginglymostomatidae	*Ginglymostoma cirratum*	Nurse shark			
Lamnidae	*Carcharodon carcharias*	Great white shark	■	■	■
Lamnidae	*Isurus oxyrinchus*	Shortfin mako shark	■	■	■
Lamnidae	*Isurus paucus*	Longfin mako shark	■	■	■
Lamnidae	*Lamna ditropis*	Salmon shark	■	■	■
Lamnidae	*Lamna nasus*	Porbeagle shark	■	■	■
Mustelidae	*Cynoponticus coniceps*	Longnose velvet dogfish			
Odontaspididae	*Odontaspis noronhai*	Bigeye sand tiger shark			
Pseudocarchariidae	*Pseudocarcharias kamoharai*	Crocodile shark			
Rhincodontidae	*Rhincodon typus*	Whale shark	■	■	■
Somniosidae	*Zameus squamulosus*	Velvet dogfish			
Sphyrnidae	*Sphyrna corona*	Scalloped bonnethead		■	■
Sphyrnidae	*Sphyrna lewini*	Scalloped hammerhead	■	■	■
Sphyrnidae	*Sphyrna media*	Scoophead		■	■
Sphyrnidae	*Sphyrna mokarran*	Great hammerhead	■	■	■
Sphyrnidae	*Sphyrna tiburo*	Bonnethead		■	■
Sphyrnidae	*Sphyrna zygaena*	Smooth hammerhead	■	■	■
Squalidae	*Squalus suckleyi*	Spotted spiny dogfish			
Squalidae	*Squalus acanthias*	Picked/Spiny dogfish			
Squatinidae	*Squatina californica*	Pacific angelshark			
Triakidae	*Galeorhinus galeus*	Tope shark		■	
Triakidae	*Mustelus dorsalis*	Sharptooth smooth-hound			
Triakidae	*Mustelus henlei*	Brown smooth-hound			
Triakidae	*Mustelus lunulatus*	Sicklefin smooth-hound			

- UNCLOS Annex 1 in Preamble of Antigua Convention
- Similar species composition as **List E**

ANNEX I. HIGHLY MIGRATORY SPECIES

1. Albacore tuna: Thunnus alalunga.
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7. Little tuna: Euthynnus alletteratus; Euthynnus affnis.
8. Southern bluefin tuna: Thunnus maccoyii.
9. Frigate mackerel: Auxis thazard; Auxis rochei.
10. Pomfrets: Family Bramidae.
11. Marlins: Tetrapturus angustirostris; Tetrapturus belone; Tetrapturus pfluegeri; Tetrapturus albidus; Tetrapturus audax; Tetrapturus georgei; Makaira mazara; Makaira indica; Makaira nigricans.
12. Sail-fishes: Istiophorus platypterus; istiophorus albicans.
13. Swordfish: Xiphias gladius.
14. Sauries: Scomberesox saurus; Cololabis saira; Cololabis adocetus; Scomberesox saurus scombroides.
15. Dolphin: Coryphaena hippurus; Coryphaena equiselis.
16. Oceanic sharks: Hexanchus griseus; Cetorhinus maximus; Family Alopiidae; Rhincodon typus; Family Carcharhinidae; Family Sphyrnidae; Family Isurida.
17. Cetaceans: Family Physeteridae; Family Balaenopteridae; Family Balaenidae; Family Eschrichtiidae; Family Monodontidae; Family Ziphiidae; Family Delphinidae.

59 species **11 species**

IATTC Director's Memorandum

- Since 2021, the Director circulates a memo to CPCs regarding specifications for data provision (on IATTC website), including for non-tuna species

SPECIFICATIONS FOR DATA PROVISION

- The technical aspects for data that are compiled and maintained by the IATTC on species under its purview have been established by the Director in accordance with Resolutions C-03-05[1] on data provision and C-04-05 on bycatch.
- The requirements for reporting on, restrictions on, and provisions for the operations of vessels in the Antigua Convention Area[2] are established in Resolutions C-18-06 on a Regional Vessel Register, C-02-03 on the capacity of the tuna fleet in the eastern Pacific Ocean, and C-11-05 on the establishment of a list of longline vessels over 24 m (LSTLFVs) authorized to operate in the eastern Pacific Ocean.
- Confidentiality of all information provided is maintained in strict accordance with Resolution C-04-10 on catch reporting ("*…categories containing two or less vessels or companies shall be pooled.*") and paragraph 50 of the IATTC Rule of Procedure ("50. *Reports and statistics of individual fisheries production and details of the operations that companies individually provide to the Commission or its staff shall be considered as confidential and treated in accordance with rules on confidentiality established by the Commission*").

IATTC Director's Memorandum

- Since 2021, the Director circulates a memo to CPCs regarding specifications for data provision (on IATTC website), including for non-tuna species
- Table 2 lists 17 tuna and tuna-like species and 46 'associated' and 'dependent' and potentially vulnerable taxa required to be reported
  - **19 sharks**, 8 rays, 10 large teleosts, 5 sea turtles, 4 marine mammals, no seabirds.

SPECIFICATIONS FOR DATA PROVISION

- The technical aspects for data that are compiled and maintained by the IATTC on species under its purview have been established by the Director in accordance with Resolutions C-03-05[1] on data provision and C-04-05 on bycatch.
- The requirements for reporting on, restrictions on, and provisions for the operations of vessels in the Antigua Convention Area[2] are established in Resolutions C-18-06 on a Regional Vessel Register, C-02-03 on the capacity of the tuna fleet in the eastern Pacific Ocean, and C-11-05 on the establishment of a list of longline vessels over 24 m (LSTLFVs) authorized to operate in the eastern Pacific Ocean.
- Confidentiality of all information provided is maintained in strict accordance with Resolution C-04-10 on catch reporting ("*…categories containing two or less vessels or companies shall be pooled.*") and paragraph 50 of the IATTC Rule of Procedure ("50. *Reports and statistics of individual fisheries production and details of the operations that companies individually provide to the Commission or its staff shall be considered as confidential and treated in accordance with rules on confidentiality established by the Commission*").

Comparisons with existing lists

Family	Species	Common name	List C	List E	UNCLOS Annex I	IATTC Memo
Alopiidae	*Alopias pelagicus*	Pelagic thresher	■	■	■	■
Alopiidae	*Alopias superciliosus*	Bigeye thresher	■	■	■	■
Alopiidae	*Alopias vulpinus*	Common thresher	■	■	■	
Carcharhinidae	*Carcharhinus albimarginatus*	Silvertip shark		■	■	
Carcharhinidae	*Carcharhinus altimus*	Bignose shark		■	■	
Carcharhinidae	*Carcharhinus brachyurus*	Copper shark	■	■	■	
Carcharhinidae	*Carcharhinus falciformis*	Silky shark	■	■	■	■
Carcharhinidae	*Carcharhinus galapagensis*	Galapagos shark	■	■	■	
Carcharhinidae	*Carcharhinus leucas*	Bull shark		■	■	
Carcharhinidae	*Carcharhinus limbatus*	Blacktip shark		■	■	■
Carcharhinidae	*Carcharhinus longimanus*	Oceanic whitetip shark	■	■	■	■
Carcharhinidae	*Carcharhinus obscurus*	Dusky shark		■	■	
Carcharhinidae	*Carcharhinus plumbeus*	Sandbar shark		■	■	
Carcharhinidae	*Carcharhinus porosus*	Smalltail shark		■	■	
Carcharhinidae	*Carcharias taurus*	Sand tiger shark		■	■	
Carcharhinidae	*Carcharhinus sorrah*	Spottail shark		■	■	
Carcharhinidae	*Nasolamia velox*	Whitenose shark		■	■	
Carcharhinidae	*Negaprion brevirostris*	Lemon shark		■	■	
Carcharhinidae	*Prionace glauca*	Blue shark	■	■	■	■
Carcharhinidae	*Rhizoprionodon longurio*	Pacific sharpnose shark		■	■	
Carcharhinidae	*Triaenodon obesus*	Whitetip reef shark		■	■	
Cetorhinidae	*Cetorhinus maximus*	Basking shark	■	■	■	
Dalatiidae	*Dalatias licha*	Kitefin shark				
Dalatiidae	*Isistius brasiliensis*	Cookie cutter shark				
Galeocerdonidae	*Galeocerdo cuvier*	Tiger shark	■	■		
Ginglymostomatidae	*Ginglymostoma cirratum*	Nurse shark				
Lamnidae	*Carcharodon carcharias*	Great white shark	■	■	■	
Lamnidae	*Isurus oxyrinchus*	Shortfin mako shark	■	■	■	■
Lamnidae	*Isurus paucus*	Longfin mako shark	■	■	■	■
Lamnidae	*Lamna ditropis*	Salmon shark	■	■	■	■
Lamnidae	*Lamna nasus*	Porbeagle shark	■	■	■	
Mustelidae	*Cynoponticus coniceps*	Longnose velvet dogfish				
Odontaspididae	*Odontaspis noronhai*	Bigeye sand tiger shark				
Pseudocarchariidae	*Pseudocarcharias kamoharai*	Crocodile shark				
Rhincodontidae	*Rhincodon typus*	Whale shark	■	■	■	
Somniosidae	*Zameus squamulosus*	Velvet dogfish				
Sphyrnidae	*Sphyrna corona*	Scalloped bonnethead		■	■	■
Sphyrnidae	*Sphyrna lewini*	Scalloped hammerhead	■	■	■	■
Sphyrnidae	*Sphyrna media*	Scoophead		■	■	■
Sphyrnidae	*Sphyrna mokarran*	Great hammerhead	■	■	■	■
Sphyrnidae	*Sphyrna tiburo*	Bonnethead		■	■	■
Sphyrnidae	*Sphyrna zygaena*	Smooth hammerhead	■	■	■	■
Squalidae	*Squalus suckleyi*	Spotted spiny dogfish				
Squalidae	*Squalus acanthias*	Picked/Spiny dogfish				
Squatinidae	*Squatina californica*	Pacific angelshark				
Triakidae	*Galeorhinus galeus*	Tope shark		■		
Triakidae	*Mustelus dorsalis*	Sharptooth smooth-hound				
Triakidae	*Mustelus henlei*	Brown smooth-hound				
Triakidae	*Mustelus lunulatus*	Sicklefin smooth-hound				

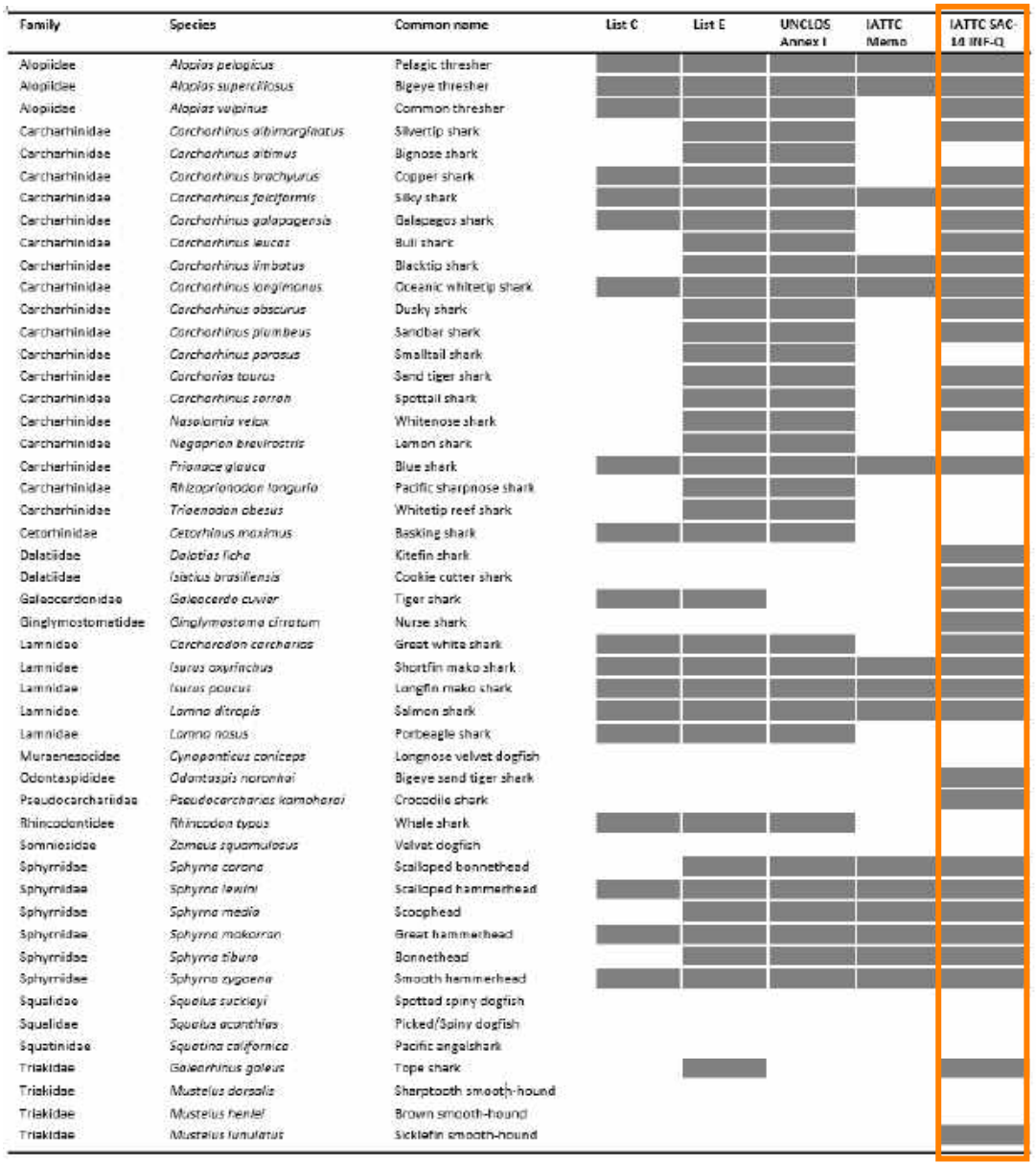
- Similar to **List C** but some key oceanic species absent
  - Common thresher
  - Whale shark
  - Great white shark

Comparisons with existing lists

Family	Species	Common name	List C	List E	UNCLOS Annex I	IATTC Memo	IATTC SAC-14 INF-Q
Alopiidae	*Alopias pelagicus*	Pelagic thresher	■	■	■	■	■
Alopiidae	*Alopias superciliosus*	Bigeye thresher	■	■	■	■	■
Alopiidae	*Alopias vulpinus*	Common thresher	■	■	■		■
Carcharhinidae	*Carcharhinus albimarginatus*	Silvertip shark		■	■		■
Carcharhinidae	*Carcharhinus altimus*	Bignose shark		■	■		
Carcharhinidae	*Carcharhinus brachyurus*	Copper shark	■	■	■		■
Carcharhinidae	*Carcharhinus falciformis*	Silky shark	■	■	■	■	■
Carcharhinidae	*Carcharhinus galapagensis*	Galapagos shark	■	■	■		■
Carcharhinidae	*Carcharhinus leucas*	Bull shark		■	■		■
Carcharhinidae	*Carcharhinus limbatus*	Blacktip shark		■	■	■	■
Carcharhinidae	*Carcharhinus longimanus*	Oceanic whitetip shark	■	■	■	■	■
Carcharhinidae	*Carcharhinus obscurus*	Dusky shark		■	■		■
Carcharhinidae	*Carcharhinus plumbeus*	Sandbar shark		■	■		■
Carcharhinidae	*Carcharhinus porosus*	Smalltail shark		■	■		
Carcharhinidae	*Carcharias taurus*	Sand tiger shark		■	■		■
Carcharhinidae	*Carcharhinus sorrah*	Spottail shark		■	■		■
Carcharhinidae	*Nasolamia velox*	Whitenose shark		■	■		■
Carcharhinidae	*Negaprion brevirostris*	Lemon shark		■	■		
Carcharhinidae	*Prionace glauca*	Blue shark	■	■	■	■	■
Carcharhinidae	*Rhizoprionodon longurio*	Pacific sharpnose shark		■	■		
Carcharhinidae	*Triaenodon obesus*	Whitetip reef shark		■	■		
Cetorhinidae	*Cetorhinus maximus*	Basking shark	■	■	■		
Dalatiidae	*Dalatias licha*	Kitefin shark					■
Dalatiidae	*Isistius brasiliensis*	Cookie cutter shark					■
Galeocerdonidae	*Galeocerdo cuvier*	Tiger shark	■	■			■
Ginglymostomatidae	*Ginglymostoma cirratum*	Nurse shark					■
Lamnidae	*Carcharodon carcharias*	Great white shark	■	■	■		■
Lamnidae	*Isurus oxyrinchus*	Shortfin mako shark	■	■	■	■	■
Lamnidae	*Isurus paucus*	Longfin mako shark	■	■	■	■	■
Lamnidae	*Lamna ditropis*	Salmon shark	■	■	■	■	■
Lamnidae	*Lamna nasus*	Porbeagle shark	■	■	■		
Mustelidae	*Cynoponticus coniceps*	Longnose velvet dogfish					
Odontaspididae	*Odontaspis noronhai*	Bigeye sand tiger shark					■
Pseudocarchariidae	*Pseudocarcharias kamoharai*	Crocodile shark					■
Rhincodontidae	*Rhincodon typus*	Whale shark	■	■	■		
Somniosidae	*Zameus squamulosus*	Velvet dogfish					
Sphyrnidae	*Sphyrna corona*	Scalloped bonnethead		■	■	■	■
Sphyrnidae	*Sphyrna lewini*	Scalloped hammerhead	■	■	■	■	■
Sphyrnidae	*Sphyrna media*	Scoophead		■	■	■	■
Sphyrnidae	*Sphyrna mokarran*	Great hammerhead	■	■	■	■	■
Sphyrnidae	*Sphyrna tiburo*	Bonnethead		■	■	■	■
Sphyrnidae	*Sphyrna zygaena*	Smooth hammerhead	■	■	■	■	■
Squalidae	*Squalus suckleyi*	Spotted spiny dogfish					
Squalidae	*Squalus acanthias*	Picked/Spiny dogfish					
Squatinidae	*Squatina californica*	Pacific angelshark					
Triakidae	*Galeorhinus galeus*	Tope shark		■			■
Triakidae	*Mustelus dorsalis*	Sharptooth smooth-hound					
Triakidae	*Mustelus henlei*	Brown smooth-hound					
Triakidae	*Mustelus lunulatus*	Sicklefin smooth-hound					■

- Staff and participants of IATTC's data improvements workshop for the industrial longline fishery in 2023 developed a list of key species (WS-DAT-01-Report, SAC-14 INF-Q).

Comparisons with existing lists



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Alopiidae	*Alopias pelagicus*	Pelagic thresher	■	■	■	■	■
Alopiidae	*Alopias superciliosus*	Bigeye thresher	■	■	■	■	■
Alopiidae	*Alopias vulpinus*	Common thresher	■	■	■		■
Carcharhinidae	*Carcharhinus albimarginatus*	Silvertip shark		■	■		■
Carcharhinidae	*Carcharhinus altimus*	Bignose shark		■	■		
Carcharhinidae	*Carcharhinus brachyurus*	Copper shark	■	■	■		■
Carcharhinidae	*Carcharhinus falciformis*	Silky shark	■	■	■	■	■
Carcharhinidae	*Carcharhinus galapagensis*	Galapagos shark	■	■	■		■
Carcharhinidae	*Carcharhinus leucas*	Bull shark		■	■		■
Carcharhinidae	*Carcharhinus limbatus*	Blacktip shark		■	■	■	■
Carcharhinidae	*Carcharhinus longimanus*	Oceanic whitetip shark	■	■	■	■	■
Carcharhinidae	*Carcharhinus obscurus*	Dusky shark		■	■		■
Carcharhinidae	*Carcharhinus plumbeus*	Sandbar shark		■	■		■
Carcharhinidae	*Carcharhinus porosus*	Smalltail shark		■	■		
Carcharhinidae	*Carcharias taurus*	Sand tiger shark		■	■		■
Carcharhinidae	*Carcharhinus sorrah*	Spottail shark		■	■		■
Carcharhinidae	*Nasolamia velox*	Whitenose shark		■	■		■
Carcharhinidae	*Negaprion brevirostris*	Lemon shark		■	■		
Carcharhinidae	*Prionace glauca*	Blue shark	■	■	■	■	■
Carcharhinidae	*Rhizoprionodon longurio*	Pacific sharpnose shark		■	■		
Carcharhinidae	*Triaenodon obesus*	Whitetip reef shark		■	■		
Cetorhinidae	*Cetorhinus maximus*	Basking shark	■	■	■		
Dalatiidae	*Dalatias licha*	Kitefin shark					■
Dalatiidae	*Isistius brasiliensis*	Cookie cutter shark					■
Galeocerdonidae	*Galeocerdo cuvier*	Tiger shark	■	■			■
Ginglymostomatidae	*Ginglymostoma cirratum*	Nurse shark					■
Lamnidae	*Carcharodon carcharias*	Great white shark	■	■	■		■
Lamnidae	*Isurus oxyrinchus*	Shortfin mako shark	■	■	■	■	■
Lamnidae	*Isurus paucus*	Longfin mako shark	■	■	■	■	■
Lamnidae	*Lamna ditropis*	Salmon shark	■	■	■	■	■
Lamnidae	*Lamna nasus*	Porbeagle shark	■	■	■		
Mustelidae	*Cynoponticus coniceps*	Longnose velvet dogfish					
Odontaspididae	*Odontaspis noronhai*	Bigeye sand tiger shark					■
Pseudocarchariidae	*Pseudocarcharias kamoharai*	Crocodile shark					■
Rhincodontidae	*Rhincodon typus*	Whale shark	■	■	■		
Somniosidae	*Zameus squamulosus*	Velvet dogfish					
Sphyrnidae	*Sphyrna corona*	Scalloped bonnethead		■	■	■	■
Sphyrnidae	*Sphyrna lewini*	Scalloped hammerhead	■	■	■	■	■
Sphyrnidae	*Sphyrna media*	Scoophead		■	■	■	■
Sphyrnidae	*Sphyrna mokarran*	Great hammerhead	■	■	■	■	■
Sphyrnidae	*Sphyrna tiburo*	Bonnethead		■	■	■	■
Sphyrnidae	*Sphyrna zygaena*	Smooth hammerhead	■	■	■	■	■
Squalidae	*Squalus suckleyi*	Spotted spiny dogfish					
Squalidae	*Squalus acanthias*	Picked/Spiny dogfish					
Squatinidae	*Squatina californica*	Pacific angelshark					
Triakidae	*Galeorhinus galeus*	Tope shark		■			■
Triakidae	*Mustelus dorsalis*	Sharptooth smooth-hound					
Triakidae	*Mustelus henlei*	Brown smooth-hound					
Triakidae	*Mustelus lunulatus*	Sicklefin smooth-hound					■

- Staff and participants of IATTC's data improvements workshop for the industrial longline fishery in 2023 developed a list of key species (WS-DAT-01-Report, SAC-14 INF-Q).
- 17 tuna and tuna-like species and 86 'associated'/'dependent'/vulnerable taxa
  - **26 sharks**, 9 rays, 28 large teleosts, 5 sea turtles, 13 marine mammals, 5 seabirds.
- Similarly precautionary as **List E**, but includes many neritic species rarely caught by tuna fleets

Conclusions

- The staff considers, at a minimum, **19 species in List C** (for industrial and artisanal fleets) be adopted as an interim list of shark species

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- The staff considers, at a minimum, **19 species in List C** (for industrial and artisanal fleets) be adopted as an interim list of shark species
- But we must consider **Article IV**. Application of the Precautionary Approach
  - 2. "*…The absence of adequate scientific information shall not be used as a reason for postponing or failing to take conservation and management measures*."
- 36 species in **List E** may be adopted, but contains several neritic species
- Given no single organization responsible for sharks in the EPO, the staff suggests **an IATTC Recommendation be adopted** for the additional 17 species to note their ecological importance and conservation concerns, and willingness to cooperate in conservation efforts initiated and supported by work of relevant organizations, if there is a clear role for IATTC to play.

Development of Options for a Shark Data Collection Program for IATTC Fisheries: Lessons And Opportunities

Shane Griffiths, Salvador Siu, Dan Ovando, Jon Lopez, Cleridy Lennert-Cody, Alexandra Aires-da-Silva

15ª Reunión del Comité Científico Asesor - 10-14 de junio de 2024
15th Meeting of the Scientific Advisory Committee – 10-14 June 2024
La Jolla, California, USA-EE.UU.

Document SAC-15-10

Resolution C-23-07

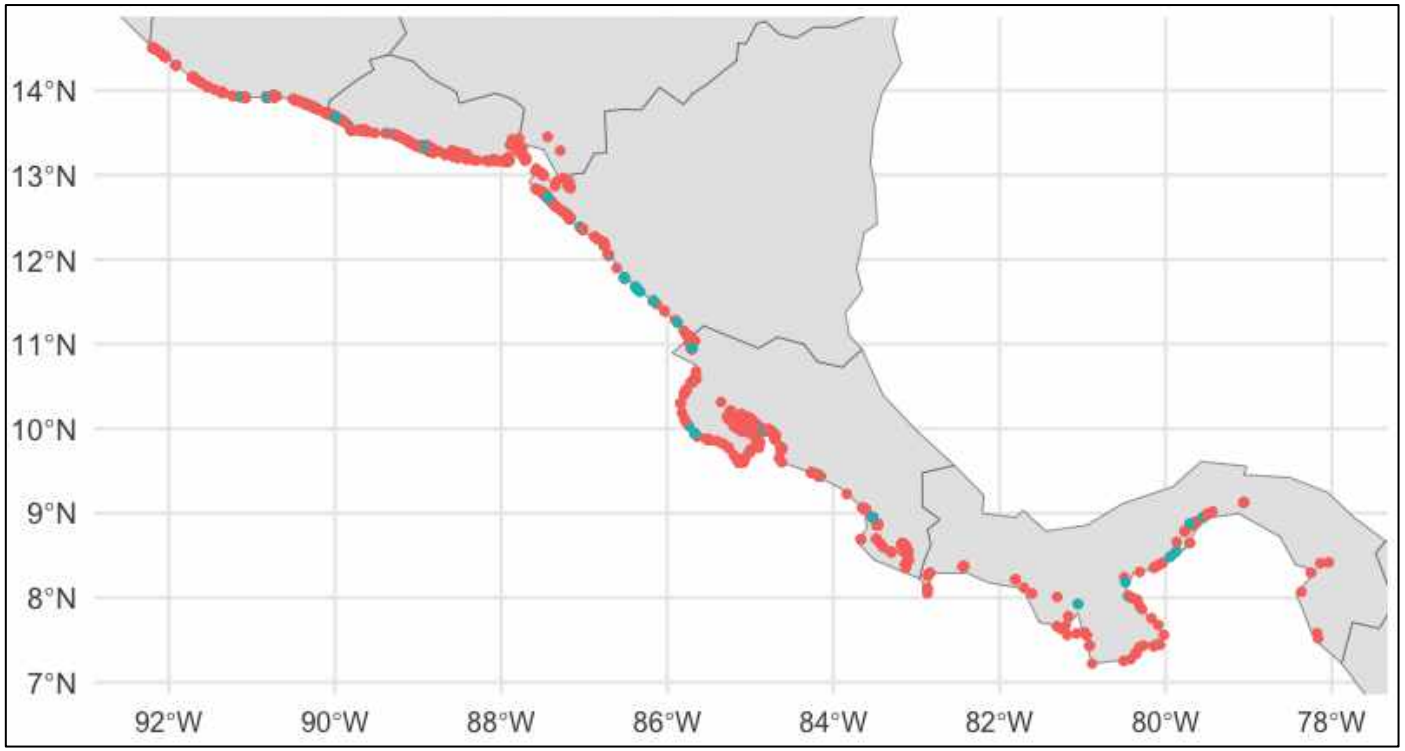
- **Resolution C-23-07 - Conservation Measures for the Protection and Sustainable Management of Sharks**

14. *"In 2024, the IATTC scientific staff, in consultation with the IATTC SAC and EBWG shall implement a data collection program for sharks associated with fisheries managed by the Commission, making use of existing research and data collection mechanisms and programs where possible. The program will include the monitoring of shark catches by small scale fisheries in coastal countries and the establishment, maintenance and strengthening of standardized data management databases, considering appropriate assistance to those CPCs"*

Small scale coastal fisheries

- IATTC have various data collection programs for ‘industrial’ longline and purse-seine fisheries in the EPO
- But very little data for small scale multispecies coastal fleets
  - Vessels <20 m LOA
  - Not “tuna fisheries”
  - Little domestic data collection
- But, thousands of vessels
- Thousands of access points
- Significant shark catches

SAC-14 INF-L



An overview of survey methods

- Artisanal fisheries a relatively new research area with few survey methods
- Marine recreational fisheries studied for decades and share many sampling difficulties with artisanal fisheries
  - Fishery dispersed across thousands of kilometres of coastline
  - Hundreds to many thousands of access points
  - Fishers often not require to report catch and/or effort
  - Lack of a licence or permit to provide a complete list frame for sampling
- Established cost-effective methods could transfer to artisanal fisheries

An overview of survey methods

- On-site survey methods
  - Access point surveys where fishers intercepted on-site – very precise catch, effort, biologicals
  - Generally very expensive due to labor and travel costs to visit many access points
  - Catch rate data collected requires an estimate of total fishery effort for expansion

Off-site survey methods

- Off-site survey methods
  - Longitudinal diary survey (hardcopy/telephone) collects daily/trip data – cheap but reporting burden
  - Retrospective recall survey – cheap but suffer from recall bias beyond 2-3 months
  - Satellite imagery – cheap high resolution instantaneous vessel counts for large areas
  - Fisher or vessel license frames – a complete list of participating fishers/vessels

Complementary survey methods

- Complementary survey methods
  - A combination of methods (e.g. on-site survey for catch rates + vessel licence frame for effort)

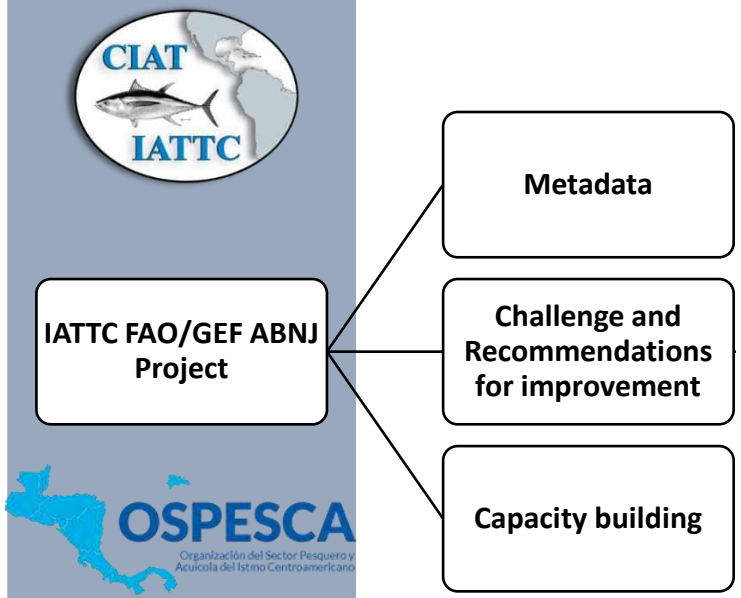
On-site catch rate data

+

Off-site satellite imagery for effort

ABNJ Tuna 1 project (GTM, SLV, NIC, CRI, PAN)

2015-2017



ABNJ Tuna 1 project (GTM, SLV, NIC, CRI, PAN)

2015-2017

IATTC FAO/GEF ABNJ Project

- Metadata
- Challenge and Recommendations for improvement
- Capacity building

2018-2019

Pilot study for shark sampling program

- Mapping shark landing sites using satellite imagery
- Landing sites characterization
- 2019 On-site recall survey for catch and effort
- Order-of-magnitude estimates-survey
- Catch sampling designs

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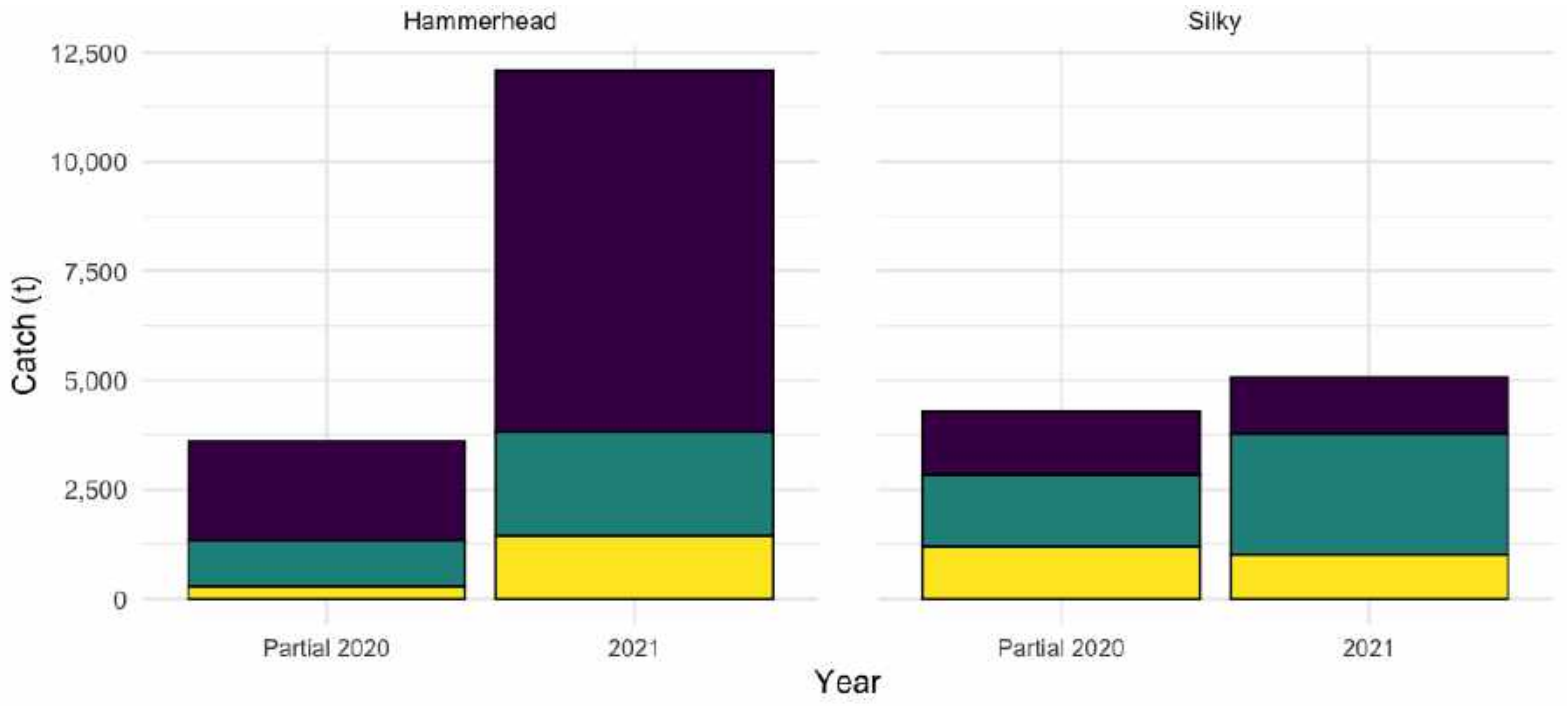
2020-2021

Long-term Shark Sampling Program

- 2020-21 Order-of-Magnitude sampling data
- Access point survey for catch sampling in artisanal fleet
- Catch sampling design for medium and advanced fleet
- Pilot tissue sampling (Mobulidae)

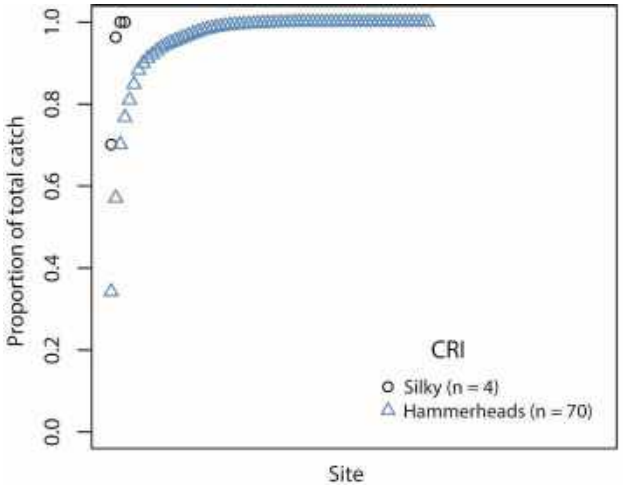
Overview of research

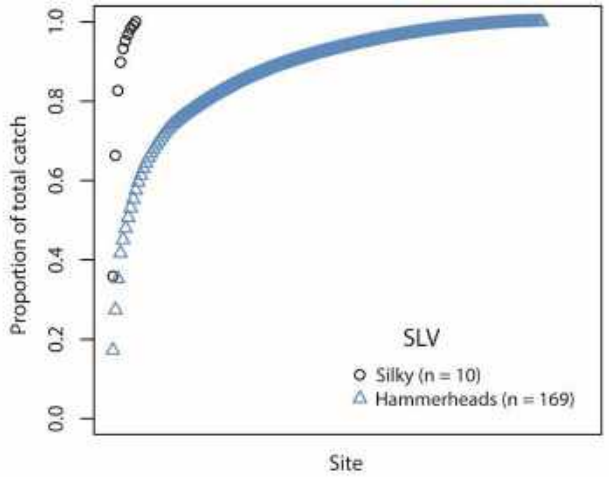
- Analysis of ABNJ Tuna 1 datasets
  - Produce order-of-magnitude estimates of catches for silky and hammerhead sharks (SAC-14 INF-L)

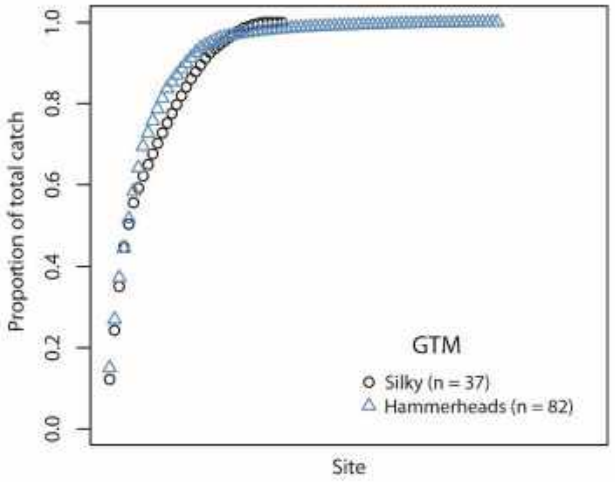


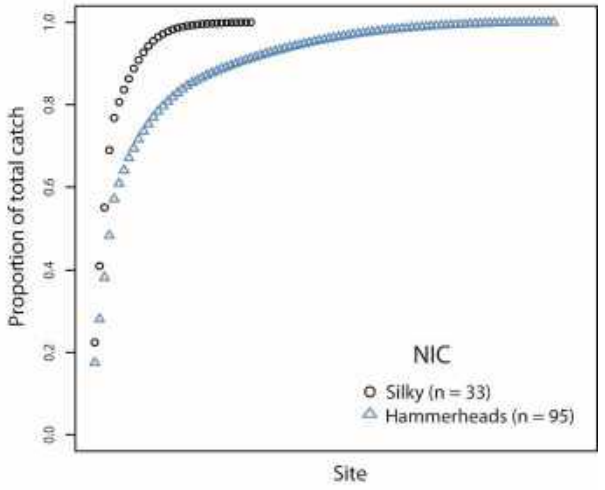
Overview of research

- Analysis of ABNJ Tuna 1 datasets
  - Produce order-of-magnitude estimates of catches for silky and hammerhead sharks (SAC-14 INF-L)
  - Analysis of 2020-21 data to determine an appropriate long-term sampling design (SAC-14-INF-P)









ABNJ Tuna 2 project (MEX, ECU, PER)

- ABNJ Tuna 2 project - 2023-2025
  1. Use satellite imagery to identify all visible vessel access points in each country
  2. Staff currently visiting shark landing sites for verification
  3. In 2024-25, ABNJ1 survey methods will be applied
- Seek common issues in ABNJ1 and ABNJ2
- Develop a robust shark monitoring program

Lessons learned from ABNJ

- Thousands of access points to sample
- Focused mainly on priority species: silky and hammerhead sharks
- Sampling focused at ‘Primary’ sites, rather than ‘Secondary’ and ‘Tertiary’
- Importance of landing sites can change over time (season or market prices)
- Therefore, surveys must be flexible to capture spatial shift in effort
- It must also be fit-for-purpose relating to the species of interest

1. Will a sampling program focus on priority or ‘most vulnerable’ species?
2. Or all species under the IATTC’s purview (min 19 species; SAC-15-09)

Priority species

- On-site methods from ABNJ1 may sufficiently sample ‘primary’ sites
- Precise catch rates and biological data (e.g. CKMR) can be collected
- Sample ‘Primary’ sites and less sampling at ‘secondary’ and ‘tertiary’ sites

- But, pilot surveys required if priority species change (e.g. silky to threshers) and will disrupt the continuity of a long time series
- Ancillary surveys required for total fleet effort (vessel registration frame)
- Cost depends on country size, but USD$100-300k per year (without CKMR)

All shark species

- Thousands of sites require sampling to cover spatial-temporal variability in catches of all species. On-site methods will be cost prohibitive
- Cost-effective ‘complementary survey’ design required, such as
  - Longitudinal diary survey for catch rates
  - Satellite imagery or vessel register for effort
- Additional on-site sampling required for size and biological data (e.g.CKMR)
- Despite being ‘cheaper’, catch precision likely to be lower for most species AND cost is likely hundreds of thousands $USD per year

Strategic vision for sharks

- Short term (1–3 years)
  - Apply EASI-Fish to data-poor species using BRPs as per 2022 and iteratively improved with new data
  - Apply ABNJ1 and ABNJ2 sampling protocols and new protocols from CKMR feasibility study
- Medium term (3–5 years)
  - Implement CKMR sampling for stock assessment tool for shark species in the EPO,
  - Update morphometric relationships and collecting biological samples for data-limited assessments
  - Model-based estimates of catches (SAC-14 INF-L) from ongoing catch monitoring.
- Long-term (10–20 years)
  - High-quality stock assessments that integrate conventional fisheries data with CKMR. This will be possible once a regional sampling program is implemented and maintained by EPO coastal states

Conclusions

- Large scale and fleets makes sampling logistically difficult and expensive
- Surveys need to be fit for purpose
- Design depends on which species Members wish to monitor
- Initially catch, effort, size time series considered for stock assessment
- However, CKMR supersedes stock assessment requiring different data
- ABNJ2 underway and furthering our understanding of these shark fisheries
- Ideally, postpone implementing a program until completion of:
  - ABNJ2 catch surveys and data analysis
  - CKMR feasibility study

Preguntas – Questions?