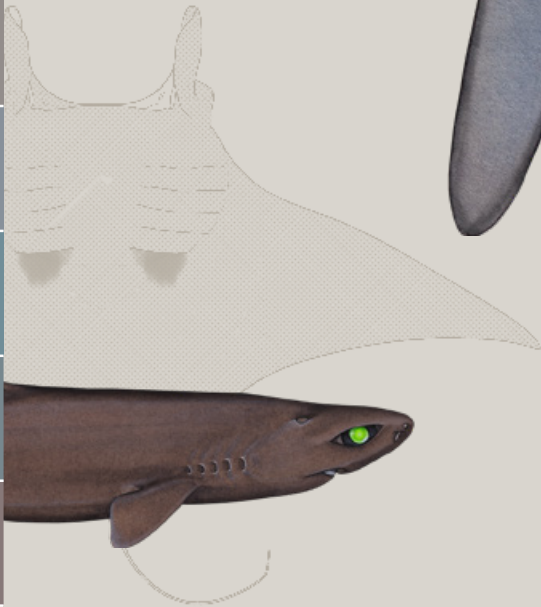
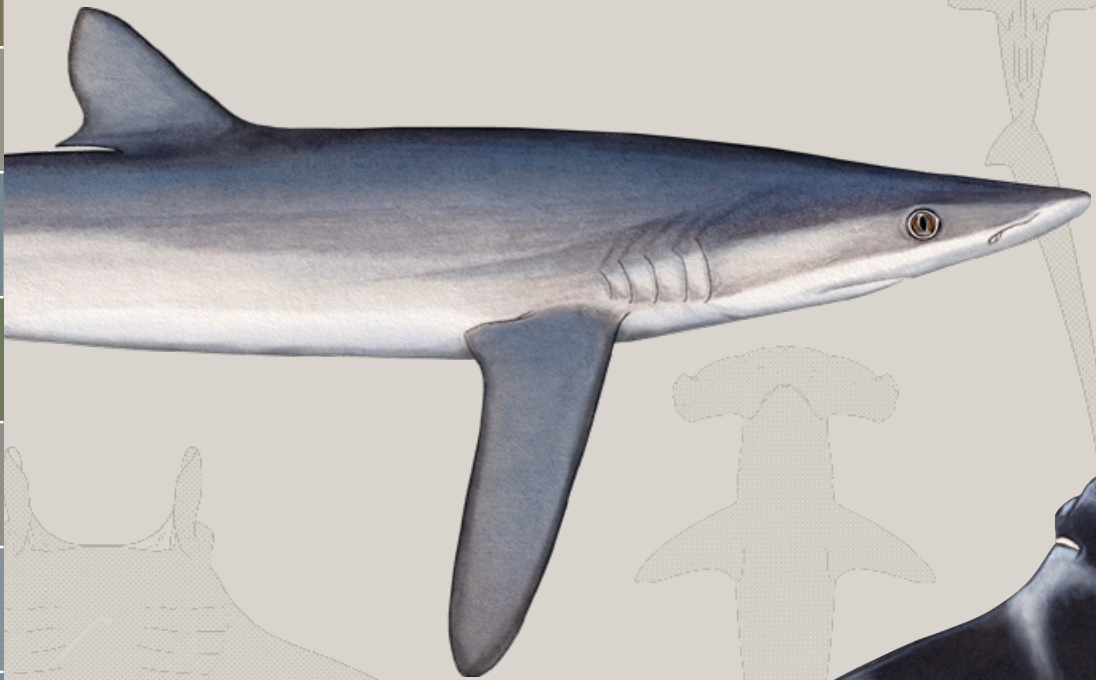




Shark and ray identification manual



for observers and crew of the western and central Pacific tuna fisheries

Shark and ray identification manual

for observers and crew of
the western and central Pacific
tuna fisheries

Timothy Park, Lindsay Marshall,
Aymeric Desurmont, Boris Colas and Neville Smith



Noumea, New Caledonia, October 2019

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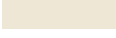
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Additional figures, as required, were designed in-house at the Pacific Community (SPC) by Boris Colas.

The two shark underwater pictures were reproduced courtesy of Jason Arnold (<https://www.jasonarnoldphoto.com/>) (p. 32) and Tomas Kotouc (<https://www.shutterstock.com/fr/g/tomas+kotouc>) (p. 50).

Common names for each species were provided by Dr Nan Yao (Cantonese and Mandarin), Dr Yukio Takeuchi and Dr Ken Okaji (Japanese), Dr Seonjae Hwang (Korean), and extracted from the FAO ASFIS list of species (English, French and Spanish).

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Food and Agriculture Organization
of the United Nations

Introduction

The SPC *Shark and ray identification manual for observers and crew of the western and central Pacific tuna fisheries* has been developed to improve the identification of shark and ray species encountered in the tropical and subtropical tuna fisheries of the Western and Central Pacific Ocean (WCPO), as well as informing on correct methods for their handling and release. The manual is designed to be a concise field guide for use by fisheries observers and fishers who collect the operational data and whose reports are the principal sources of catch information for fisheries management in the world's largest tuna fishery.

Although sharks and rays are an incidental bycatch of pelagic tuna fisheries, these fisheries are accredited with causing significant declines in the populations of some shark and ray species. The 44 shark and ray species in this guide include those with adaptations to being pinnacle predators, huge planktonic feeders or small parasitic predators of large pelagic fish and mammals. These species are included because they are caught incidentally, or are set on because of their association with tuna, or interact with fishing operations through their depredation of the catch in the WCPO tropical and subtropical tuna fisheries.

Because pelagic shark and ray populations are adversely affected by tuna fisheries, the Western and Central Pacific Fisheries Commission (WCPFC) has designated 14 shark species and six mobulid species as **Key Shark Species** (for data provision) in the WCPO. Vessels fishing in the WCPO and fisheries observers are required to report their catch for each of the 14 Key Shark Species, which are listed below.

- Blue shark (*Prionace glauca*) – since 2008
- Mako sharks (*Isurus oxyrinchus*, *I. paucus*) – since 2008
- Oceanic whitetip shark (*Carcharhinus longimanus*) – since 2008
- Thresher sharks (*Alopias superciliosus*, *A. pelagicus* and *A. vulpinus*) – since 2008
- Silky shark (*C. falciformis*) – since 2009
- Porbeagle shark (*Lamna nasus*) – (south of 20°S) since 2010
- Hammerhead sharks (*Eusphyra blochii*, *Sphryna lewini*, *S. mokarran* and *S. zygaena*) – since 2010
- Whale shark (*Rhincodon typus*) – since 2012

- Manta and mobulid rays (*Mobula* spp.) – since 2017. Note that the manta and mobulid species identified as Key Shark Species by SC13¹ have since undergone a revision of nomenclature, which is reflected in the species listed in this guide (*Mobula alfredi*, *M. birostris*, *M. tarapacana*, *M. mobular*, *M. thurstoni*, and *M. kuhlii*).

Furthermore, some of these Key Shark Species have been designated as **Species of Special Interest (SSI)**. The shark and ray SSI are the oceanic whitetip, the silky shark, the whale shark and the mobulid rays. These are regulated as no-retention, no-live landing species (OCS, FAL), no-targeted-set by purse-seine vessels (RHN), and all require specific data to be collected by observers, including location, length, sex, fate and condition. Observers should also record their interactions with the primary fishing gear.

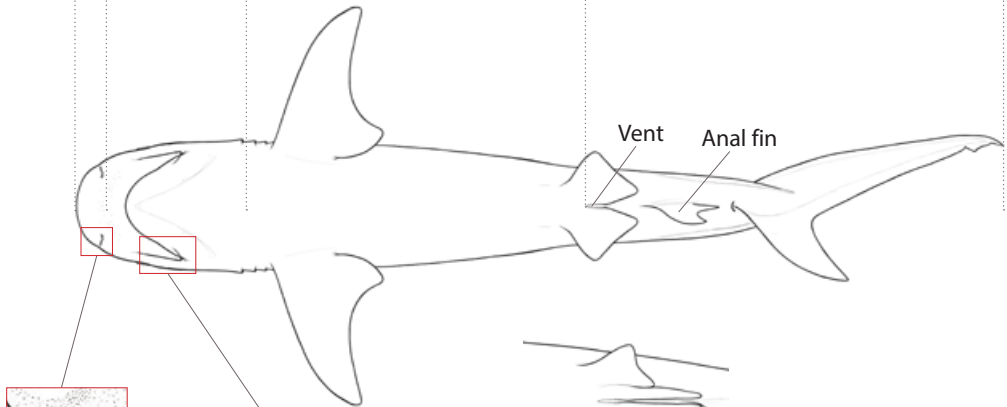
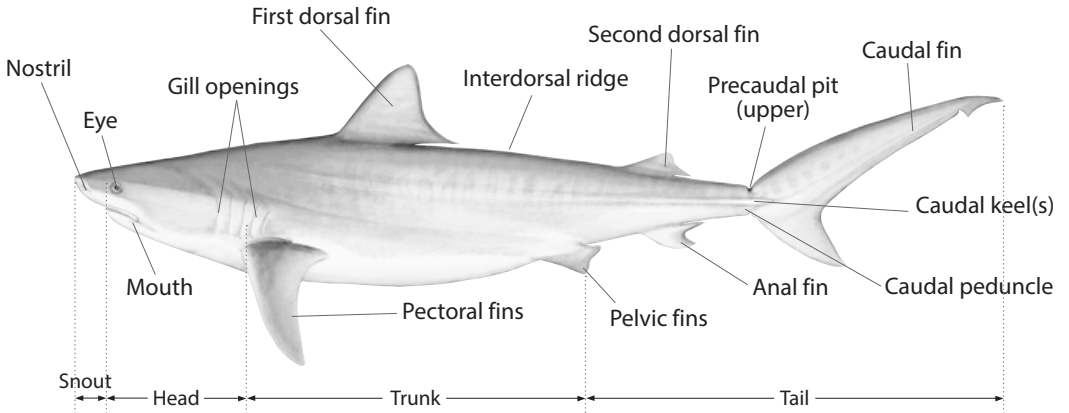
This guide is organised in three tools:

1. The first provides a pathway of 43 identification key steps. It is preceded by illustrated definitions of shark and ray key external features.
2. The second consists of detailed illustrations of the 44 species of sharks and rays to show key features and their natural colouration when alive.
3. The third details the WCPFC best handling guidelines for the safe release of whale sharks and mobulids (since 2018), and other sharks (since 2019) incidentally caught during fishing operations. Reference sources are also provided.

¹ WCPFC-SC13-2017/ST-WP-07

Main shark and ray external features and measurements

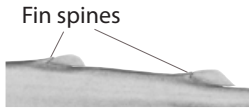
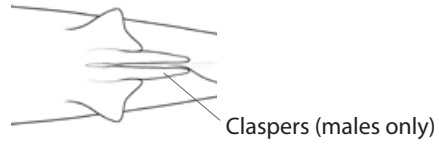
Shark external features



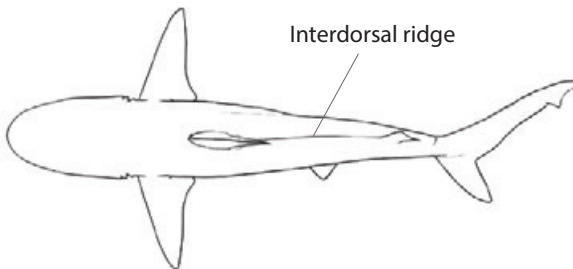
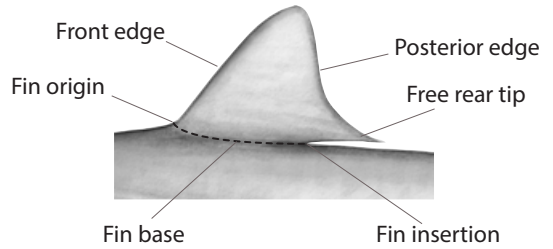
Nasal flap



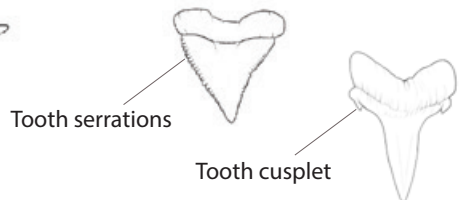
Upper and lower labial furrows



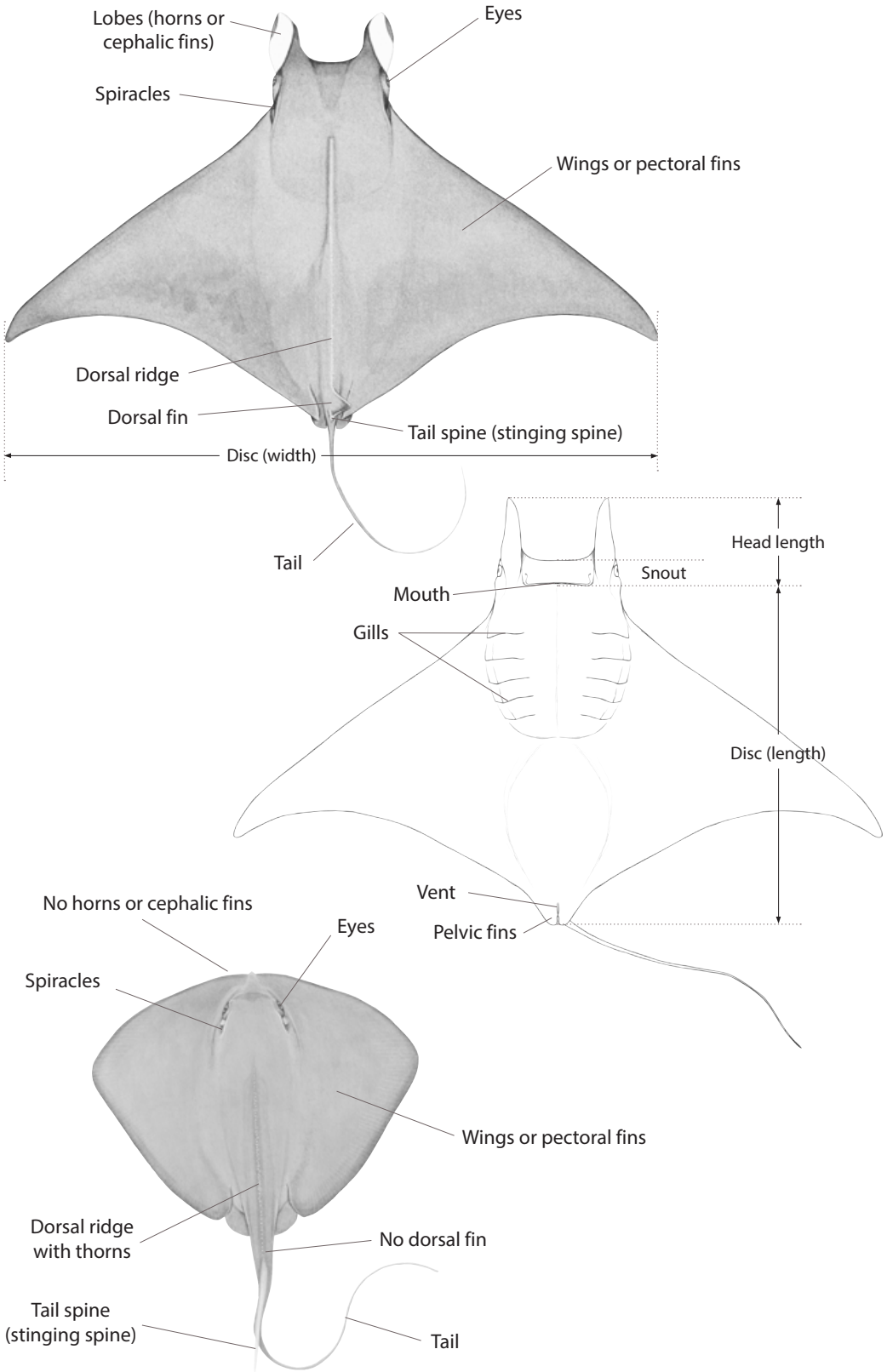
Fin spines



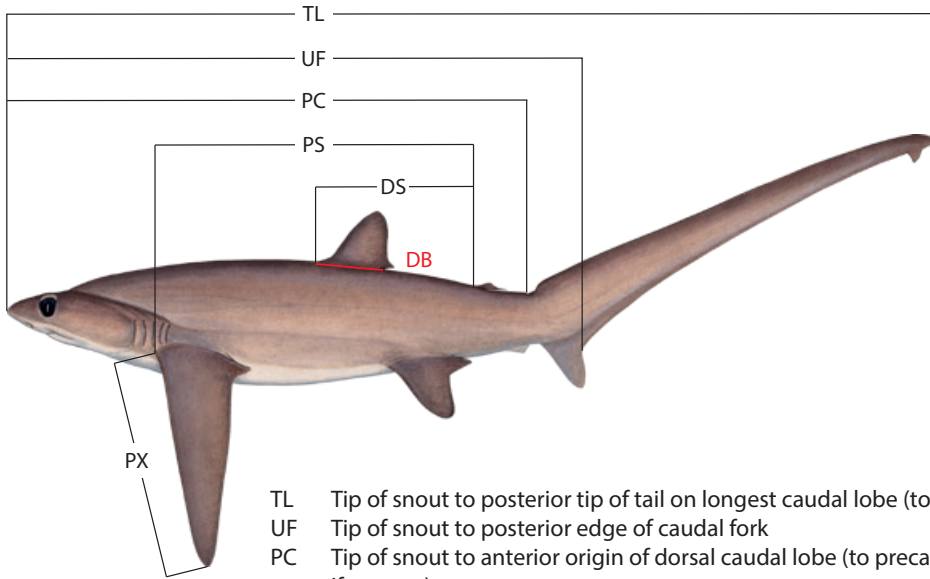
Interdorsal ridge



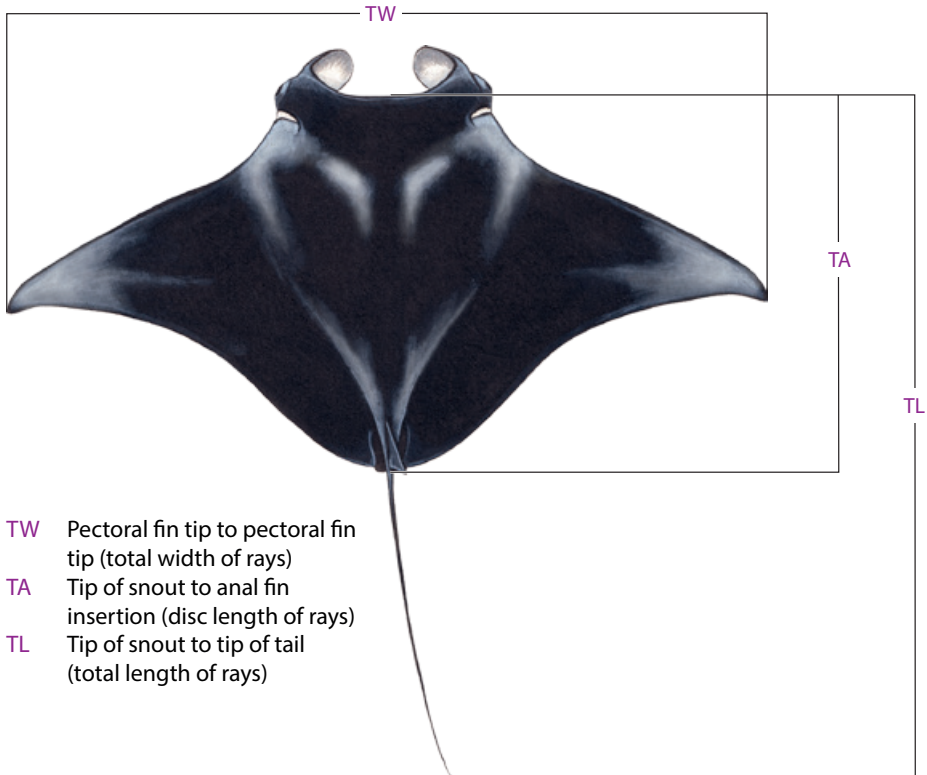
Ray external features



Shark and ray measurements



- TL Tip of snout to posterior tip of tail on longest caudal lobe (total length)
- UF Tip of snout to posterior edge of caudal fork
- PC Tip of snout to anterior origin of dorsal caudal lobe (to precaudal pit if present)
- DS Anterior origin of first dorsal to anterior origin of second dorsal
- DB Dorsal fin base from anterior fin origin to posterior fin insertion
- PX Length of pectoral fin from its anterior origin to fin apex (fin tip)



- TW Pectoral fin tip to pectoral fin tip (total width of rays)
- TA Tip of snout to anal fin insertion (disc length of rays)
- TL Tip of snout to tip of tail (total length of rays)

Key for shark and ray species identification

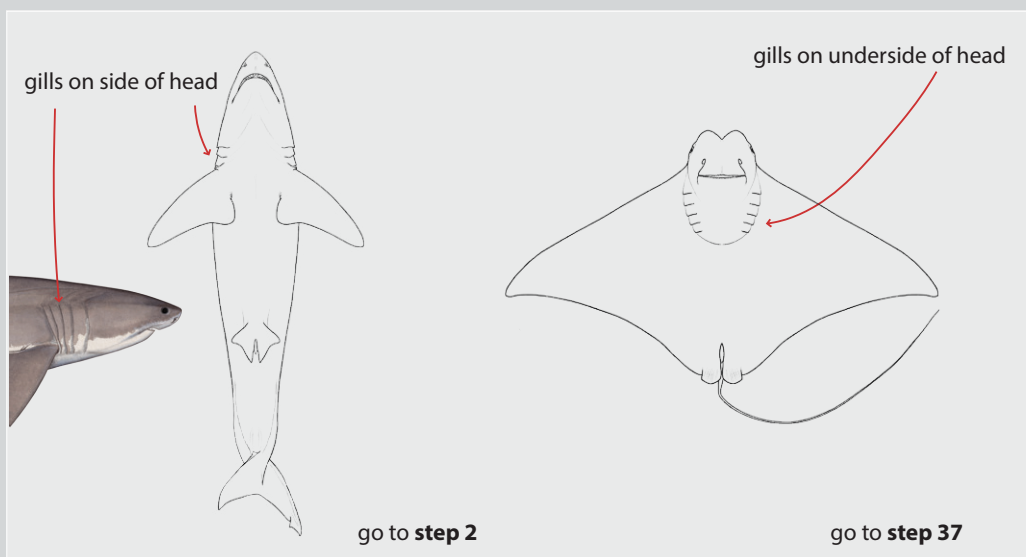
To improve identification of the shark and ray species a dichotomous key based on readily seen external features has been developed for field use and observer training.

A dichotomous key relies on a pathway of steps of paired alternative descriptions (mutually exclusive couplets) identifying or contrasting features that are reliable (are always found in live and dead forms and both sexes of the species), consistent (are present throughout the year and across the range) and clear or measurable. Each couplet is a branch that either removes a selection of species or identifies one from the rest (e.g. key step 1, below, used to separate sharks and rays).

This key has been developed to provide a simple standardised process for identifying sharks and rays that are either not already known, or to help distinguish among similar looking species. The key features used in the couplets have been identified and verified as standardised key features by shark scientific experts.

The key couplets identify clear features for identification and so reflect the systematics of sharks, and the identification groups the species in their families. The use of key features also affects the number of steps to identify a species. Where there is only one species of a family, the key quickly identifies the species from the others. Where there are many similar species, such as in the family Carcharhinidae, identification takes up to 26 steps of couplets to distinguish the final species pair.

The key for shark and ray identification has 43 couplet pairs that identify 44 species of pelagic sharks and rays. The key should be used routinely to identify species and the detailed illustrations in the following section can then be used to confirm identification. The use of this key in training will standardise the process followed by observers to identify sharks and rays.



1

2

6 gill openings on each side of head

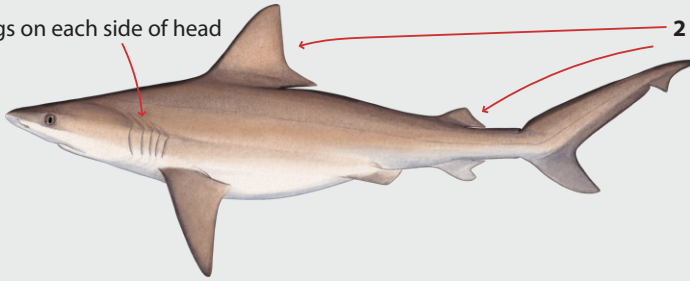
1 dorsal fin



Hexanchus griseus (Bluntnose sixgill shark) p. 24

5 gill openings on each side of head

2 dorsal fins



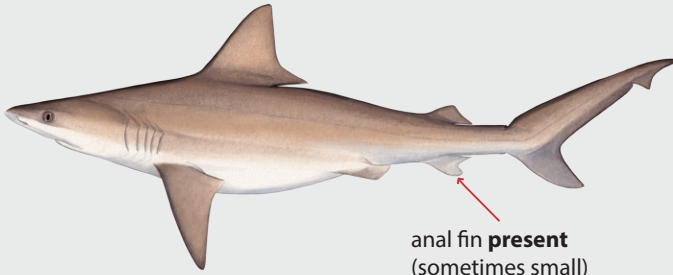
go to **step 3**

3



anal fin **absent**

go to **step 4**



anal fin **present**
(sometimes small)

go to **step 6**

4

dorsal fins **without** spines



go to **step 5**

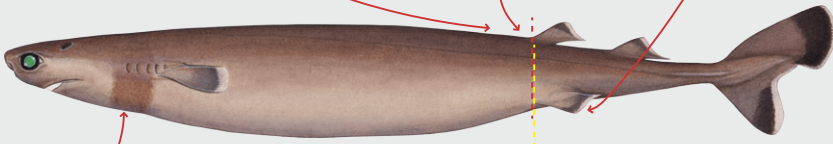
dorsal fins **with** small spines



Zameus squamulosus (Velvet dogfish) p. 25

dorsal fins located well back on body

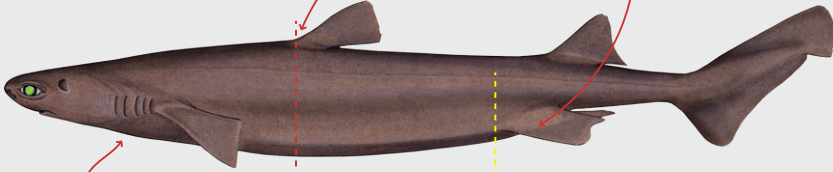
first dorsal over pelvic fins



dark collar around head at gill region

Isistius brasiliensis (Cookie-cutter shark) p. 26

first dorsal well in front of pelvic fin

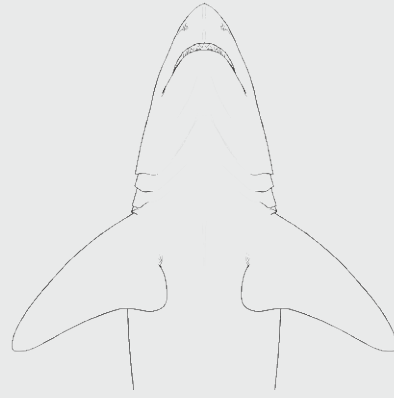
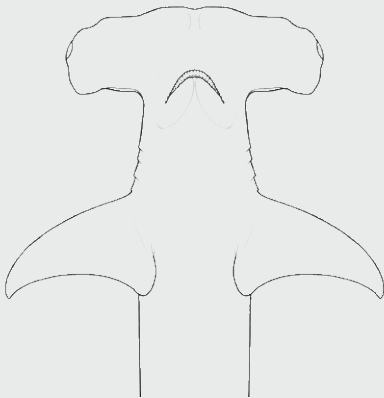


no dark collar around head

Dalatias licha (Black shark, Kitefin shark) p. 27

head **hammer-shaped**

head **not hammer-shaped**

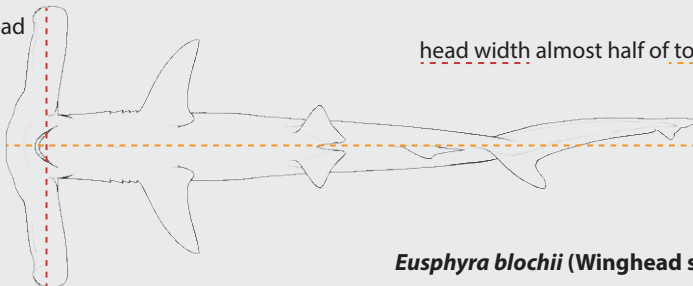


go to **step 7**

go to **step 10**

lateral blades of head very long, narrow and wing-like

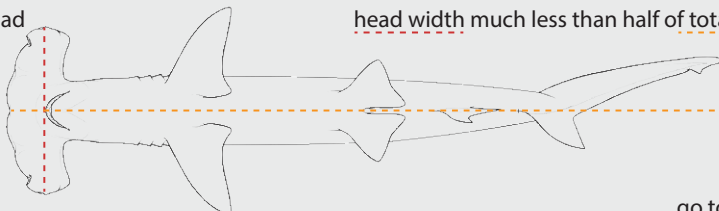
head width almost half of total length



Eusphyra blochii (Winghead shark) p. 28

lateral blades of head relatively broad, shorter and not wing-like

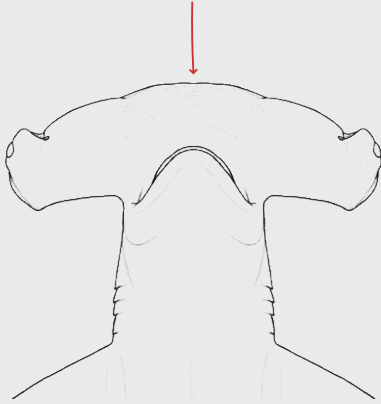
head width much less than half of total length



go to **step 8**

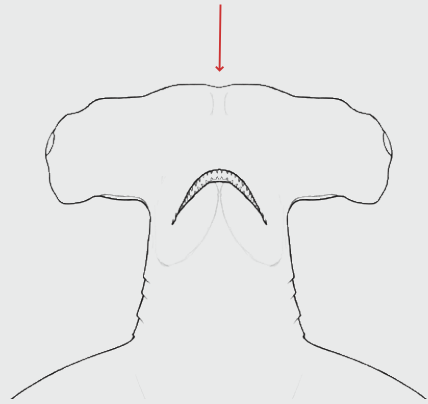
8

anterior profile of head **without** a median indentation



Sphyrna zygaena (Smooth hammerhead) p. 29

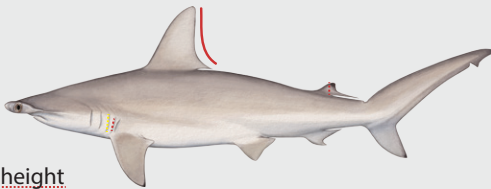
anterior profile of head **with** a median indentation



go to **step 9**

9

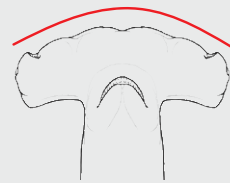
first dorsal fin semi-falcate, only moderately high



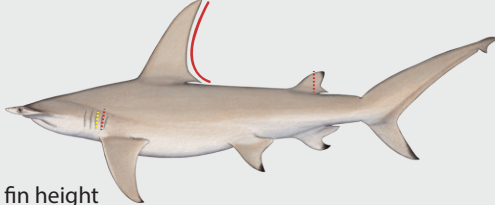
2nd dorsal fin height
smaller than or equal to the length of the 3rd gill slit

Sphyrna lewini (Scalloped hammerhead) p. 30

anterior profile of head convex



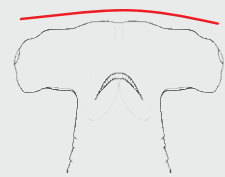
first dorsal falcate, very tall in adults



2nd dorsal fin height
greater than the length of the 3rd gill slit

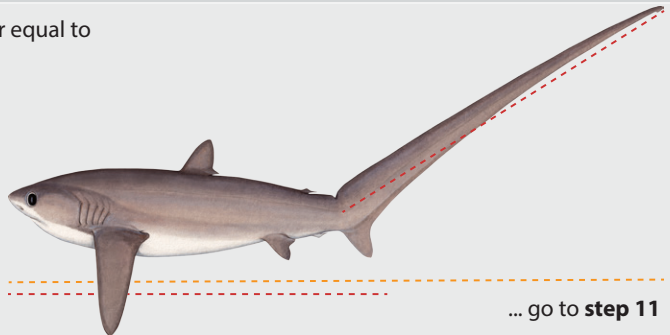
Sphyrna mokarran (Great hammerhead) p. 31

anterior profile of head nearly straight (slightly convex in small juveniles)



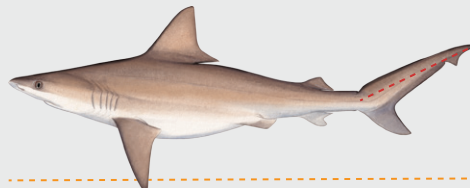
10

length of caudal fin greater than or equal to half of total length



... go to **step 11**

length of caudal fin much less than half of total length

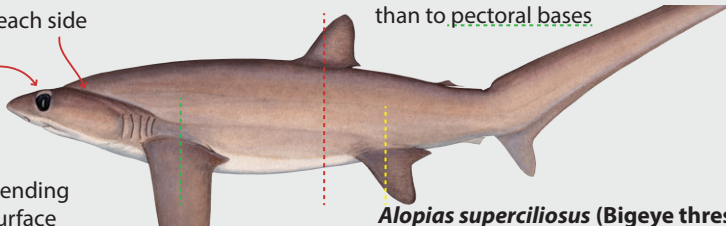


... go to **step 13**

head with deep groove extending around each side

base of first dorsal fin closer to pelvic bases than to pectoral bases

eyes very large, extending onto dorsal head surface

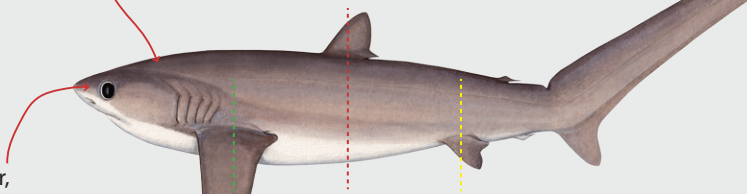


***Alopias superciliosus* (Bigeye thresher)** p. 33

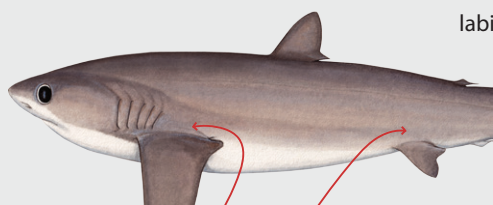
head without a deep groove

base of first dorsal fin about equidistant between pectoral and pelvic bases, or closer to pectoral fin bases

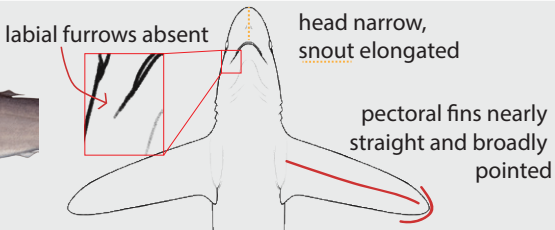
eyes smaller, with orbits lateral on head



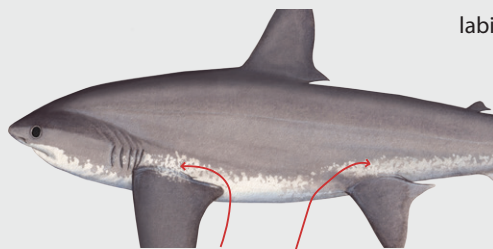
go to **step 12**



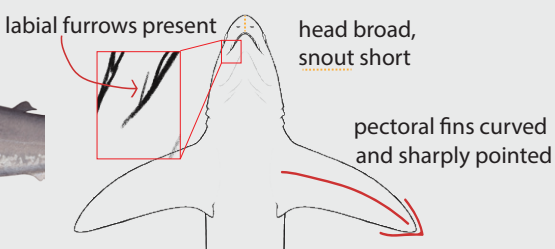
flanks above pectoral and pelvic fins not white



***Alopias pelagicus* (Pelagic thresher)** p. 34

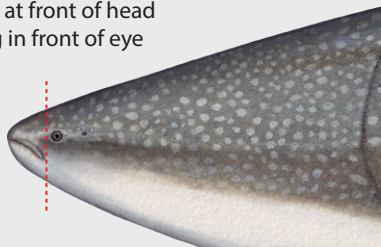


flanks above pectoral and pelvic fins white



***Alopias vulpinus* (Thresher shark)** p. 35

mouth at front of head ending in front of eye

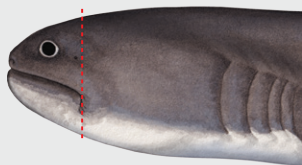


checkerboard colour pattern



***Rhincodon typus* (Whale shark)** p. 36

mouth not at front of head ending below or behind eye



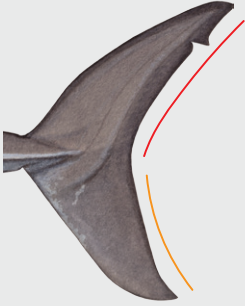
no checkerboard colour pattern



go to **step 14**

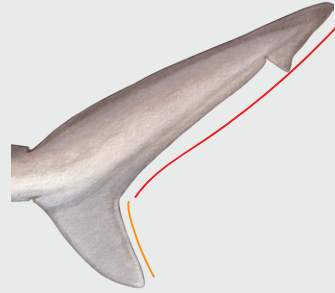
14

caudal fin lunate
upper lobe less than 1.5 times
longer than lower lobe



go to **step 15**

caudal fin heterocercal
upper lobe more than 1.5 times
longer than lower lobe



go to **step 19**

15

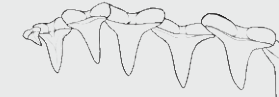
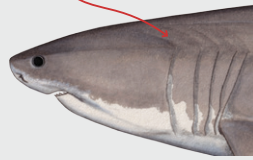
very large gills
extend onto surface of the head
and ventral surface



teeth minute

***Cetorhinus maximus* (Basking shark)** p. 37

gills do not extend onto surface of the
head or ventral surface



teeth blade-like, much larger

go to **step 16**

16

upper teeth broadly triangular,
flattened and strongly serrated

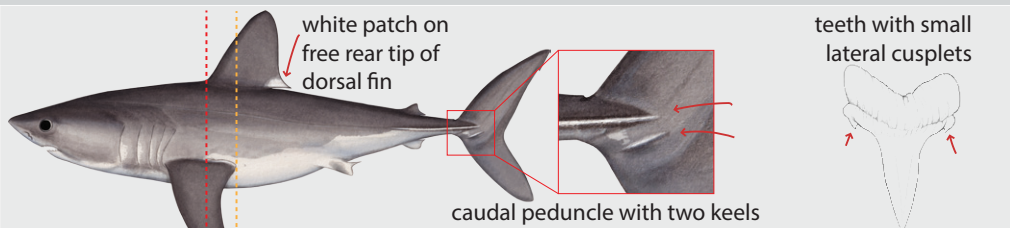


***Carcharodon carcharias* (White shark)** p. 38

upper teeth long, narrow, and
without serrations

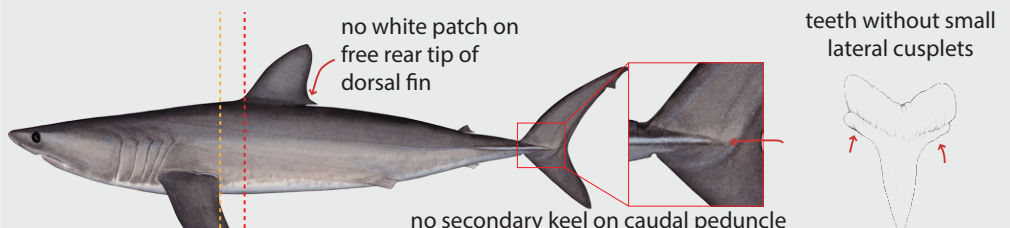


go to **step 17**



first dorsal-fin origin over base or inner margin of pectoral fins

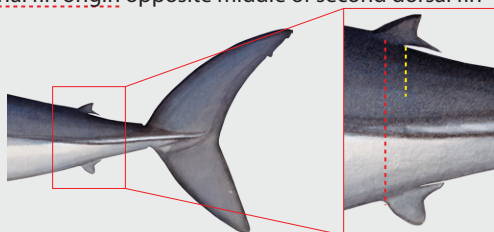
Lamna nasus (Porbeagle) p. 39



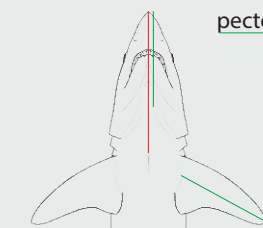
first dorsal-fin origin posterior to pectoral fins

go to **step 18**

anal fin origin opposite middle of second dorsal fin

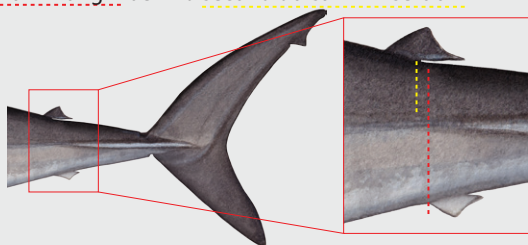


pectoral fins much shorter than head length

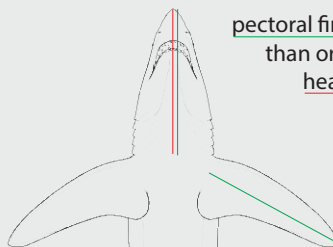


Isurus oxyrinchus (Shortfin mako) p. 40

anal fin origin behind second dorsal fin insertion

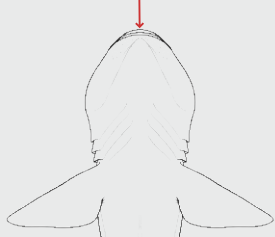


pectoral fins longer than or equal to head length



Isurus paucus (Longfin mako) p. 41

mouth huge and terminal

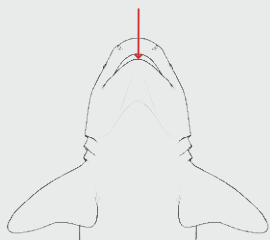


lower jaw extending to snout tip

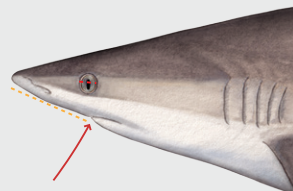


Megachasma pelagios (Megamouth shark) p. 42

mouth located on undersurface of the head (subterminal)



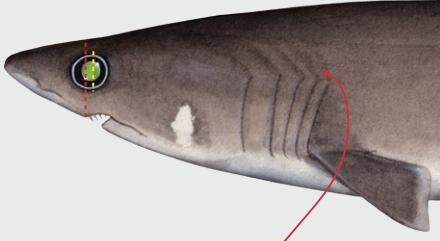
preoral distance distinctly longer than eye diameter



go to **step 20**

20

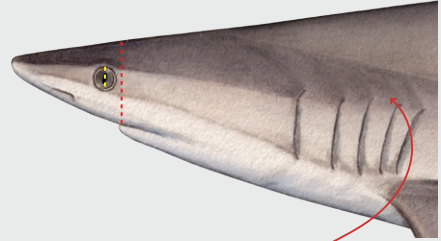
eyes very large,
more than half the greatest height of snout



gill openings extending onto dorsal surface of head

Pseudocarcharias kamoharai
(Crocodile shark) p. 43

eyes smaller,
less than half the greatest height of snout

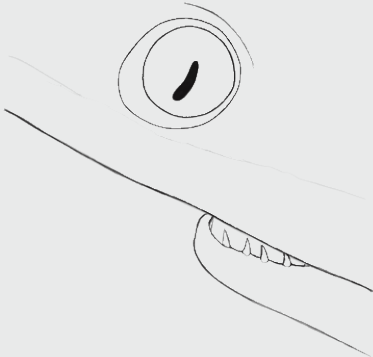


gill openings **not** extending onto dorsal surface of head

go to **step 21**

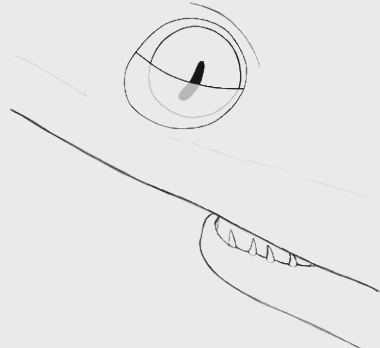
21

eyelids fixed, not capable of closing over eyes



Odontaspis noronhai (Bigeye sand tiger) p. 44

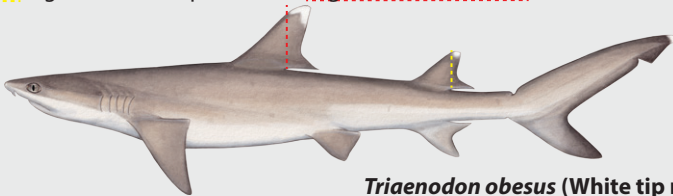
eyelids capable of closing over eye (nictitating)



go to **step 22**

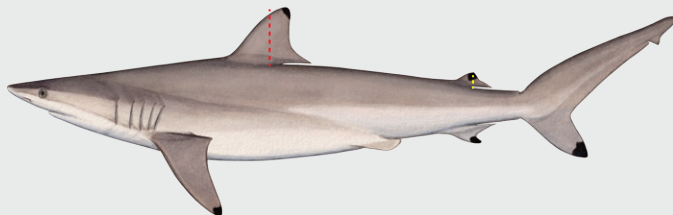
22

second dorsal fin higher than or equal to half height of first dorsal fin.



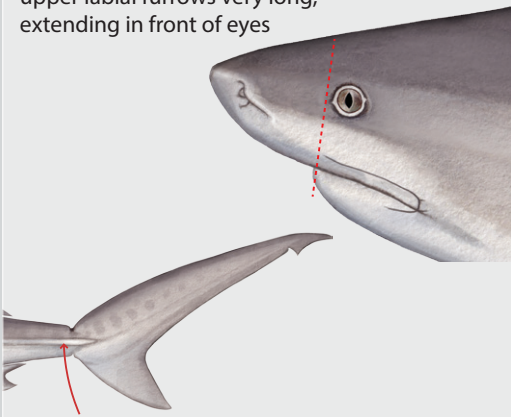
Triaenodon obesus (White tip reef shark) p. 45

second dorsal fin smaller than half height of first dorsal fin



go to **step 23**

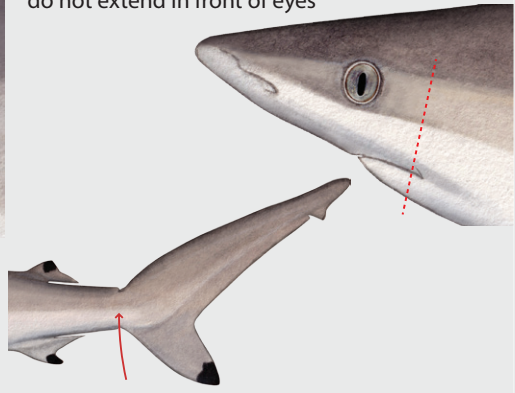
upper labial furrows very long, extending in front of eyes



prominent lateral keels present on caudal peduncle

***Galeocerdo cuvier* (Tiger shark)** p. 46

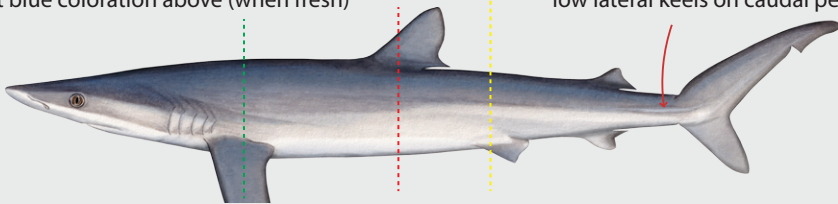
upper labial furrows do not extend in front of eyes



lateral keels absent from caudal peduncle (weak keels present in the Blue shark)

go to **step 24**

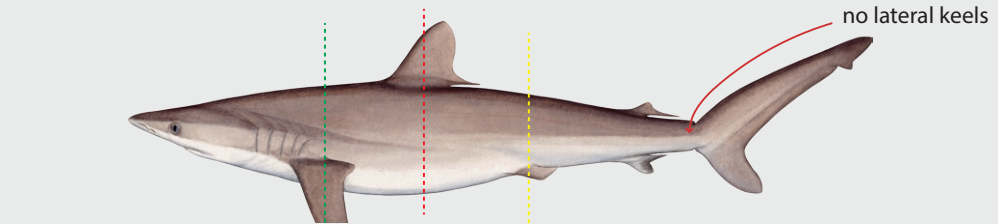
brilliant blue coloration above (when fresh)



low lateral keels on caudal peduncle

first dorsal fin much closer to pelvic fins than pectoral fins

***Prionace glauca* (Blue shark)** p. 47

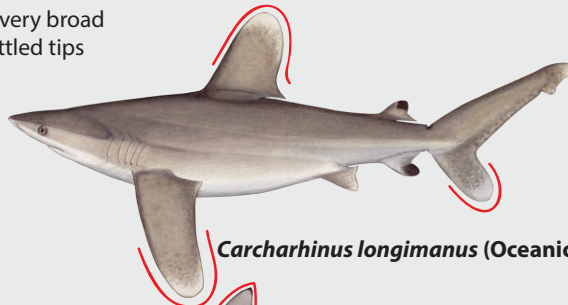


first dorsal fin midway between pectoral and pelvic fins or closer to pectoral fins

no lateral keels

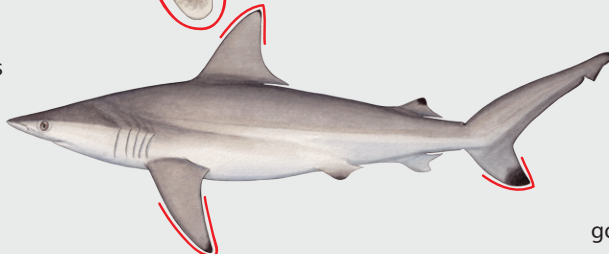
go to **step 25**

first dorsal and pectoral fins very broad with rounded and white mottled tips



***Carcharhinus longimanus* (Oceanic whitetip)** p. 48

fins not mottled white; first dorsal and pectoral fins tapering with pointed tips



go to **step 26**

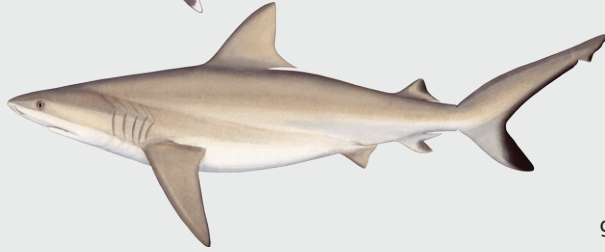
26

first dorsal fin, pectoral, pelvic and caudal fins **with** conspicuous white tips and posterior edges



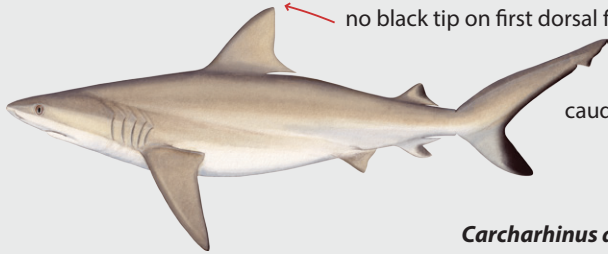
Carcharhinus albimarginatus (Silvertip shark) p. 49

first dorsal fin, pectoral, pelvic and caudal fins **without** white tips



go to **step 27**

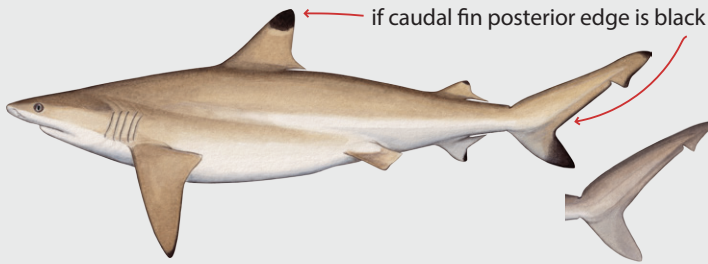
27



no black tip on first dorsal fin (sometimes white tip)

caudal fin with prominent posterior black edge

Carcharhinus amblyrhynchos (Grey reef shark) p. 51



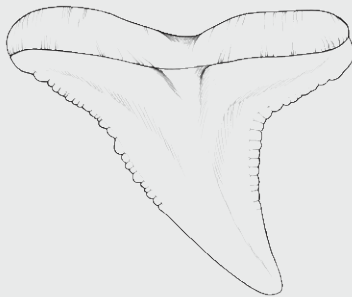
if caudal fin posterior edge is black then first dorsal fin tip is black

caudal fin with prominent posterior black edges or plain

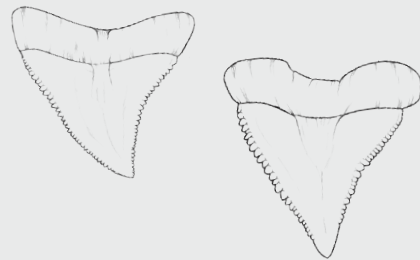
go to **step 28**

28

largest upper teeth with bent, hooked, narrow cusps

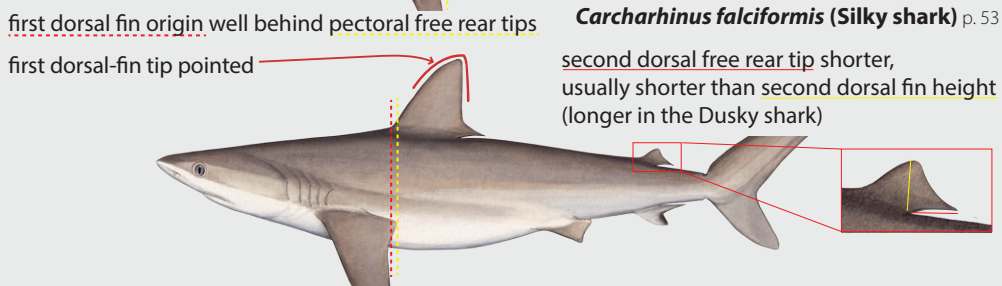
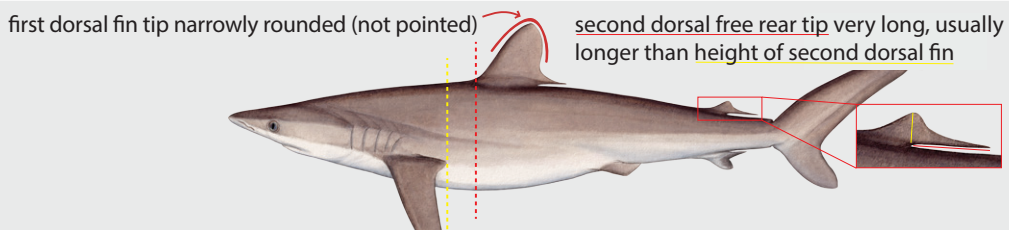
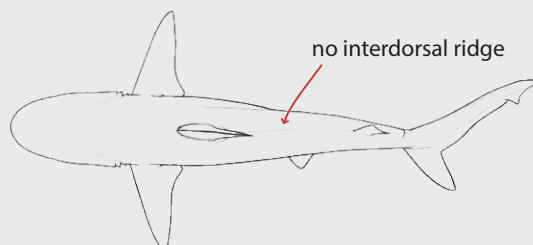
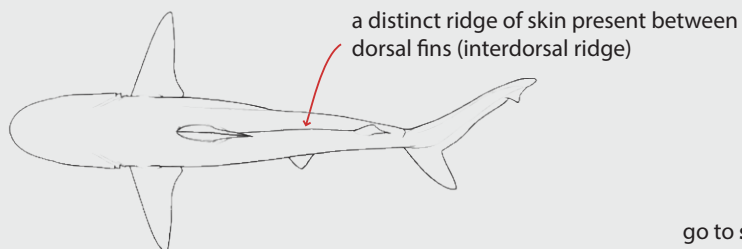


largest upper teeth variably shaped but never with bent, hooked cusps



Carcharhinus brachyurus (Bronze whaler) p. 52

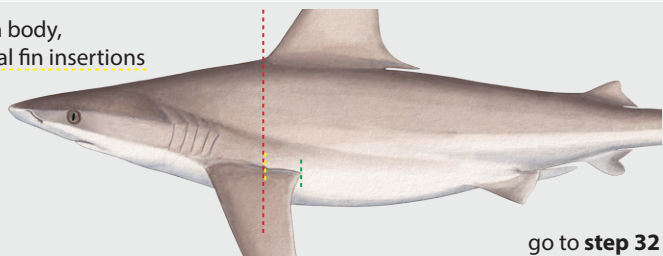
go to **step 29**



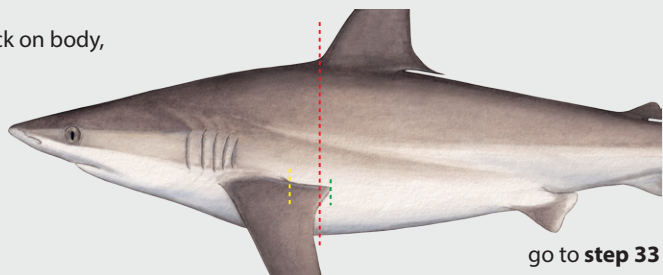
first dorsal-fin origin in front of or over pectoral free rear tips

go to **step 31**

first dorsal fin located forward on body, its origin almost opposite pectoral fin insertions

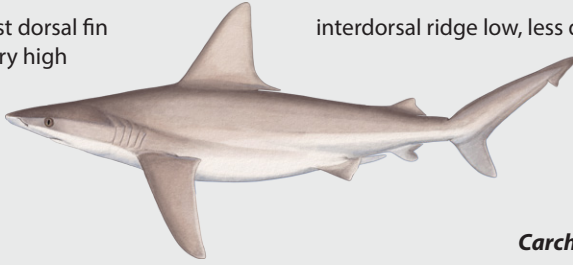


first dorsal fin located further back on body, its origin closer to pectoral fin free rear tips than to insertions



32

first dorsal fin very high



interdorsal ridge low, less distinct

anterior nasal flaps low and inconspicuous



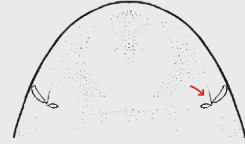
***Carcharhinus plumbeus* (Sandbar shark)** p. 54

first dorsal fin lower



interdorsal ridge high, very distinct

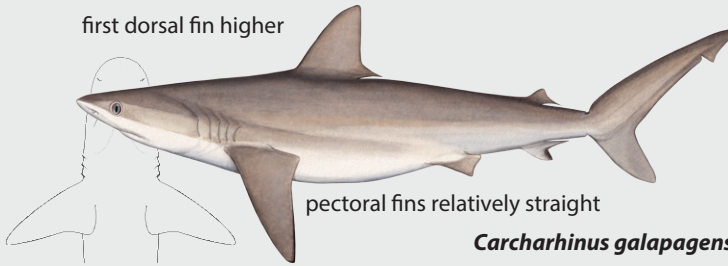
anterior nasal flaps high and triangular



***Carcharhinus altimus* (Bignose shark)** p. 55

33

first dorsal fin higher



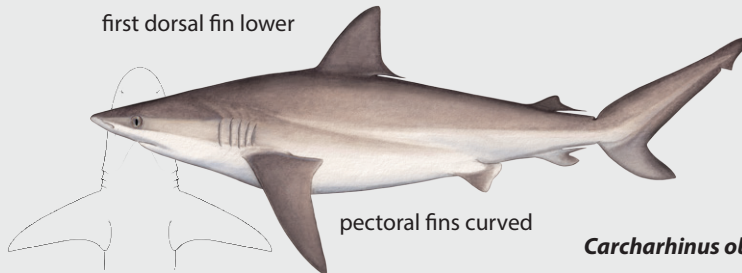
pectoral fins relatively straight

upper teeth relatively narrow



***Carcharhinus galapagensis* (Galapagos shark)** p. 56

first dorsal fin lower



pectoral fins curved

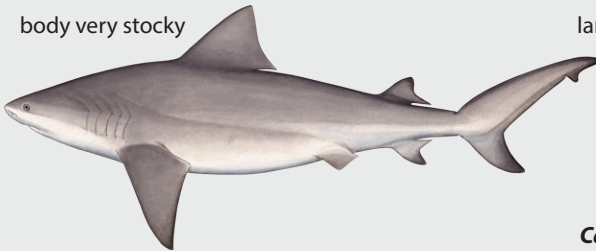
upper teeth relatively broad and oblique



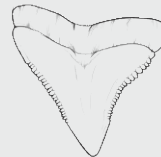
***Carcharhinus obscurus* (Dusky shark)** p. 57

34

body very stocky

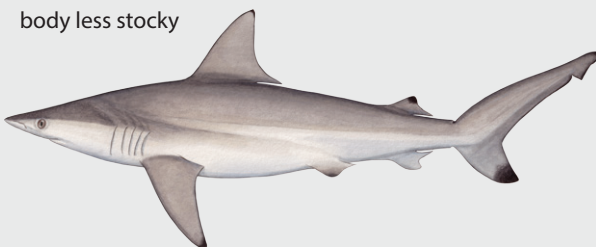


largest upper teeth broad, triangular and serrated



***Carcharhinus leucas* (Bull shark)** p. 58

body less stocky

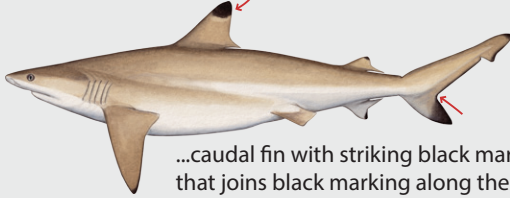


largest upper teeth narrow and sometimes serrated



go to **step 35**

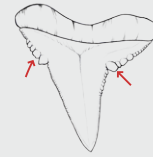
first dorsal fin with a very distinct black tip AND



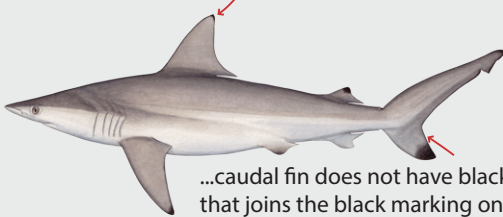
...caudal fin with striking black marking on lower lobe that joins black marking along the posterior margin

Carcharhinus melanopterus (Blacktip reef shark) p. 59

largest upper teeth with coarse basal serrations

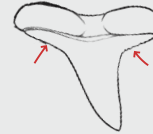


first dorsal fin may or may not have black tip AND



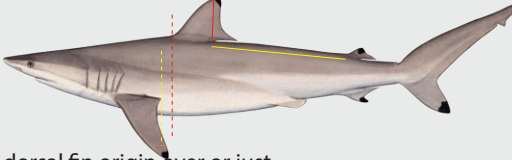
...caudal fin does not have black posterior margin that joins the black marking on the lower lobe

largest upper teeth without coarse basal serrations



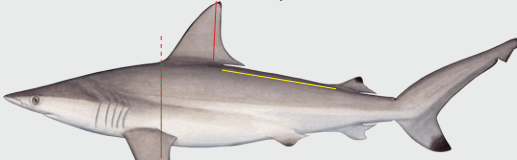
go to **step 36**

first dorsal fin relatively low (height >2.2 times in interdorsal space)



first dorsal fin origin over or just behind pectoral free rear tips

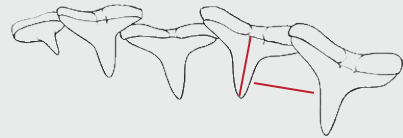
first dorsal fin taller (height <2.2 times in interdorsal space)



first dorsal fin origin over or just forward of pectoral fin insertions

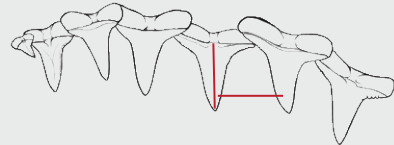
Carcharhinus limbatus (Common blacktip shark) p. 61

teeth very short, teeth in middle rows usually shorter than distance between teeth

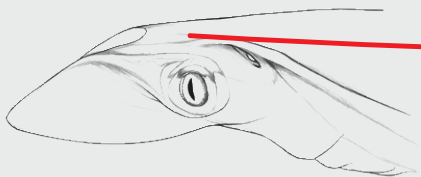


Carcharhinus brevipinna (Spinner shark) p. 60

teeth of normal size, teeth in middle rows usually taller than distance between teeth



head not elevated above disc

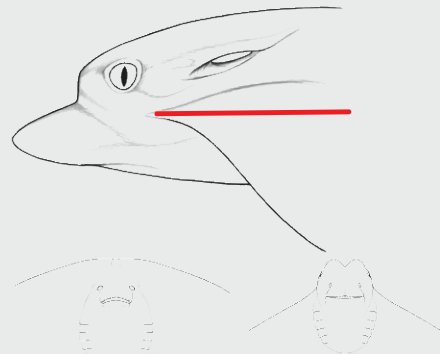


snout modified into a pair of elongate lobes on each side of head



go to **step 38**

head elevated above disc



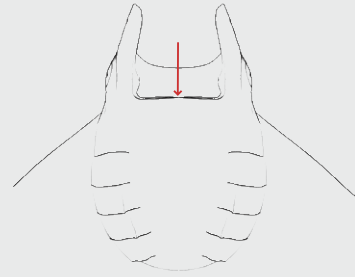
snout formed as a single, convex, lobe-like process or pair of rounded lobes

go to **step 43**

38

mouth terminal on head

mouth subterminal on ventral surface of head



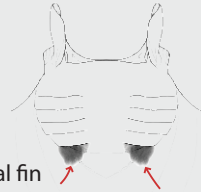
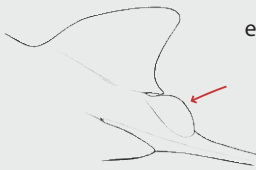
go to **step 39**

go to **step 40**

39

a large, black, semi-circular spot emanating from both of the fifth gill slits

anterior margin of white shoulder patches parallel with front of head

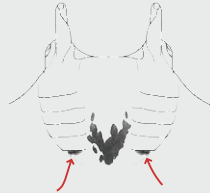
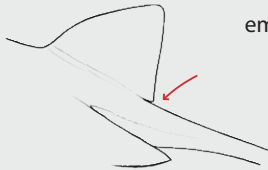


calcified mass containing an embedded spine present behind dorsal fin

***Mobula birostris* (Giant manta)** p. 62

a small black semi-circular spot emanating from both of the fifth gill slits

anterior margin of white shoulder patches curving posteriorly



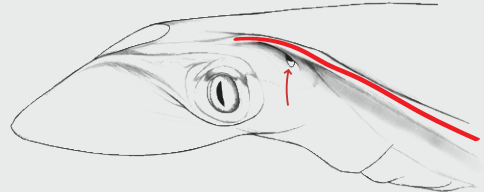
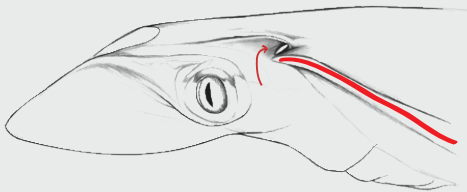
no calcified mass of spine present behind dorsal fin

***Mobula alfredi* (Reef manta)** p. 63

40

spiracles long, slit-like and dorsal to the plane of the pectoral fins

spiracles small, subcircular and ventral to the plane of the pectoral fins

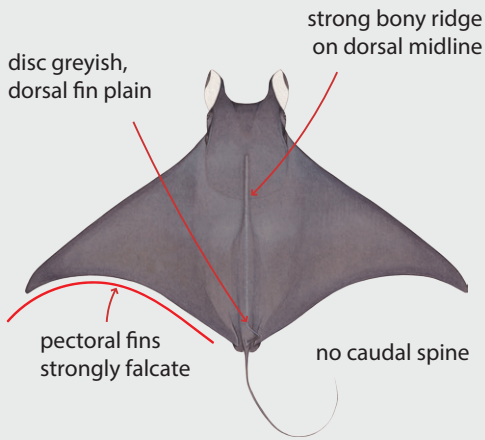


large animals, reaching well over 2 m disc width

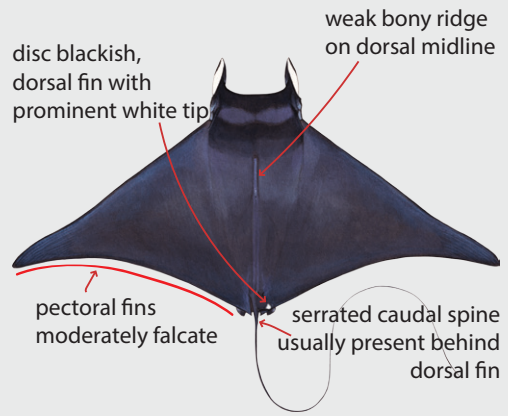
small animals, not reaching 2 m disc width

go to **step 41**

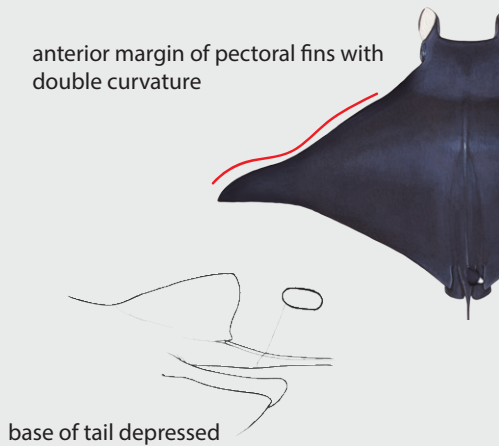
go to **step 42**



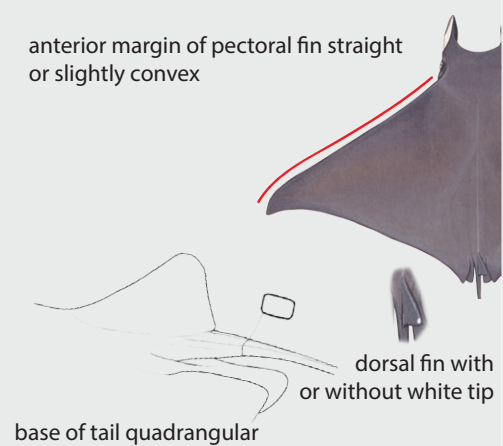
***Mobula tarapacana* (Chilean devilray)** p. 64



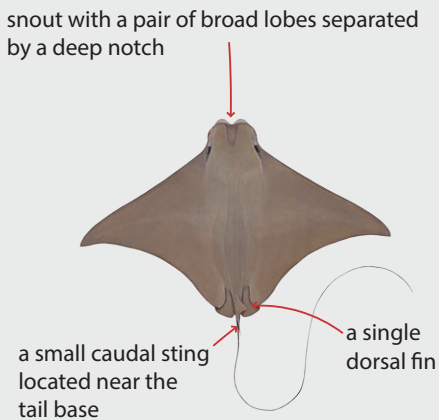
***Mobula mobular* (Giant devilray)** p. 65



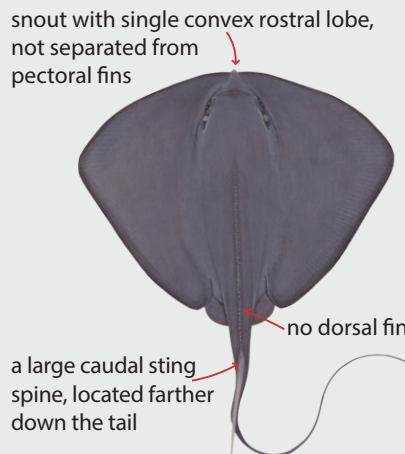
***Mobula thurstoni* (Bentfin devilray)** p. 66



***Mobula kuhlii* (Shortfin devilray)** p. 67



***Rhinoptera javanica* (Javan cownose ray)** p. 68



***Pteroplatytrygon violacea* (Pelagic stingray)** p. 69

Species details and illustrations

The following 44 species of pelagic sharks and rays have been carefully illustrated to show the key features as well as their natural colouration when alive. The species are in the same order as they are identified in the keys. As a result, species are naturally grouped into families, allowing the page edges to be colour-coded for ease of use. The sequence in which the families and species appear is not the one traditionally found in taxonomic guides.

Similarly, the species are arranged with the most similar ones placed on opposing pages to help a visual comparison of characteristic features.

This guide has been developed with the intention of providing illustrations as anatomically and colour correct as possible to facilitate identification in the field.

Each page also provides:

- the scientific and common English names of the species, and of the family it belongs to;
- vernacular names in six other languages – Cantonese, French, Japanese, Korean, Mandarin and Spanish – to facilitate exchanges among observers, crew and other fisheries agency field staff;
- the chain of specific keys used to identify the species – when identification reaches family level, the keys become orange;
- other characteristic features that distinguish similar species; and
- a figure to compare the maximum known size of each species with that of a six-foot tall human being. It is an important feature, as some similar looking species may have significant size differences.

Hexanchus griseus

Bluntnose sixgill shark

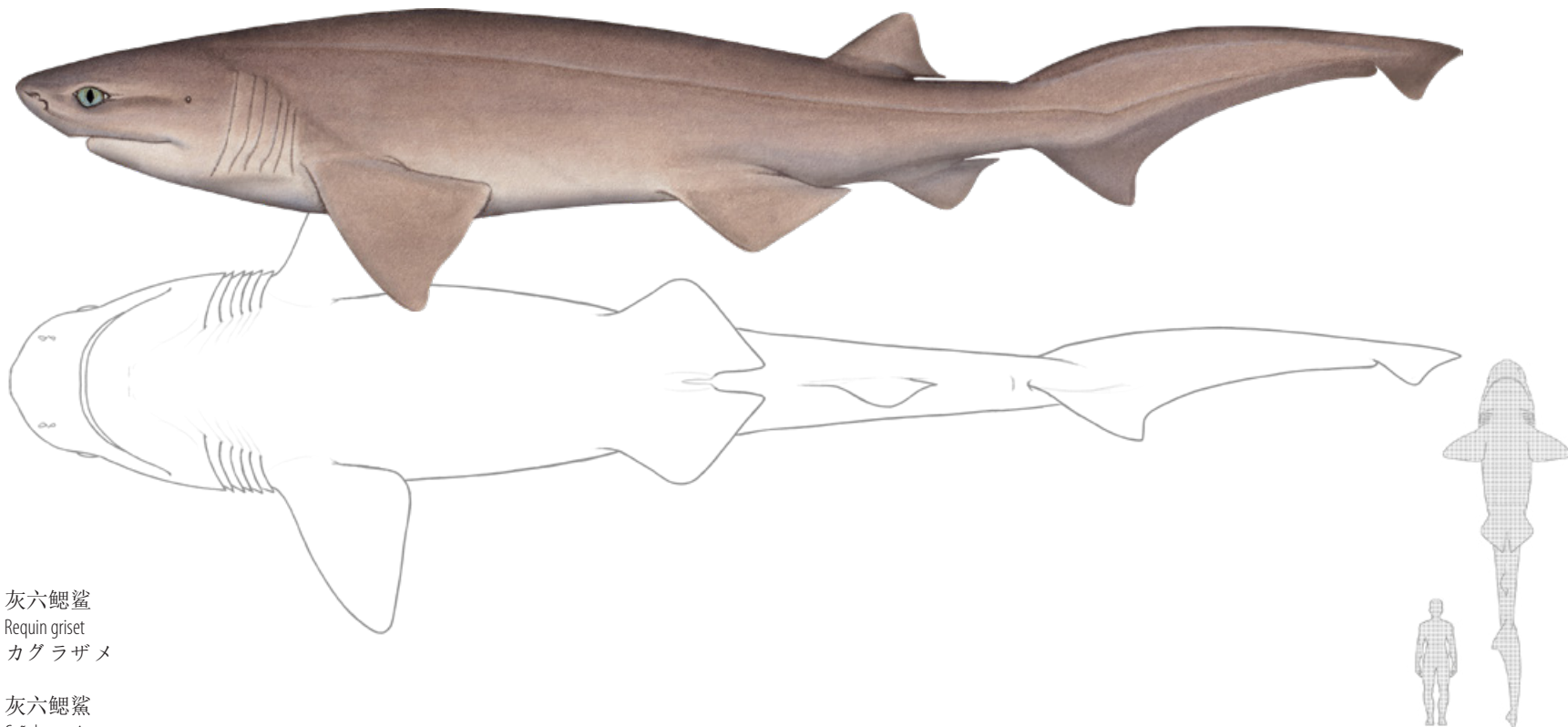
Hexanchidae: Cow sharks



Identification keys **1** **2**

Six pairs of gill slits
A single dorsal fin

24



- Cantonese: 灰六鰓鯊
- French: Requin grisé
- Japanese: カグラザメ
- Korean:
- Mandarin: 灰六鰓鯊
- Spanish: Cañabota gris



Cantonese: 异鳞鲨
French: Squale grogneur velouté
Japanese: ピロウドザメ
Korean:
Mandarin: 異鳞鮫 (刺鯊)
Spanish: Bruja boca chica

Small spines present on dorsal fins
Second dorsal fin larger than first dorsal fin



Identification keys **1** **2** **3** **4**

Zameus squamulosus

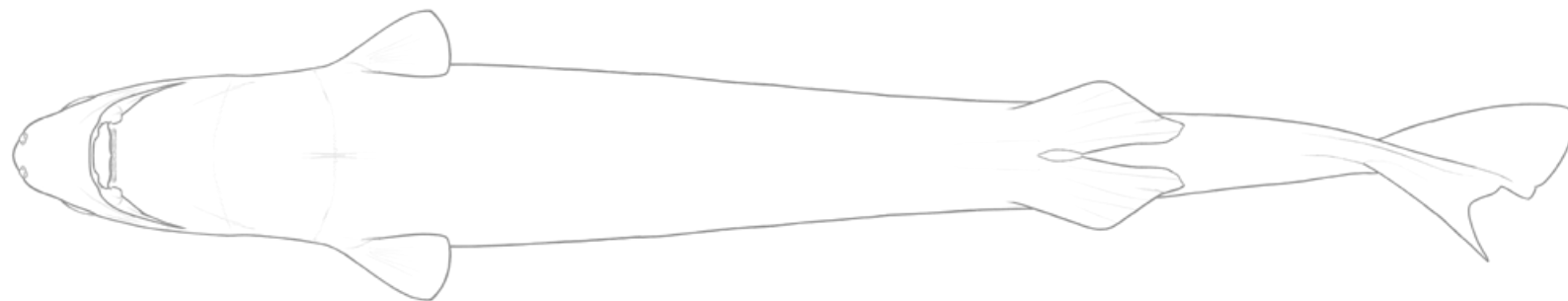
Velvet dogfish

Somniosidae: Sleeper sharks

SSQ

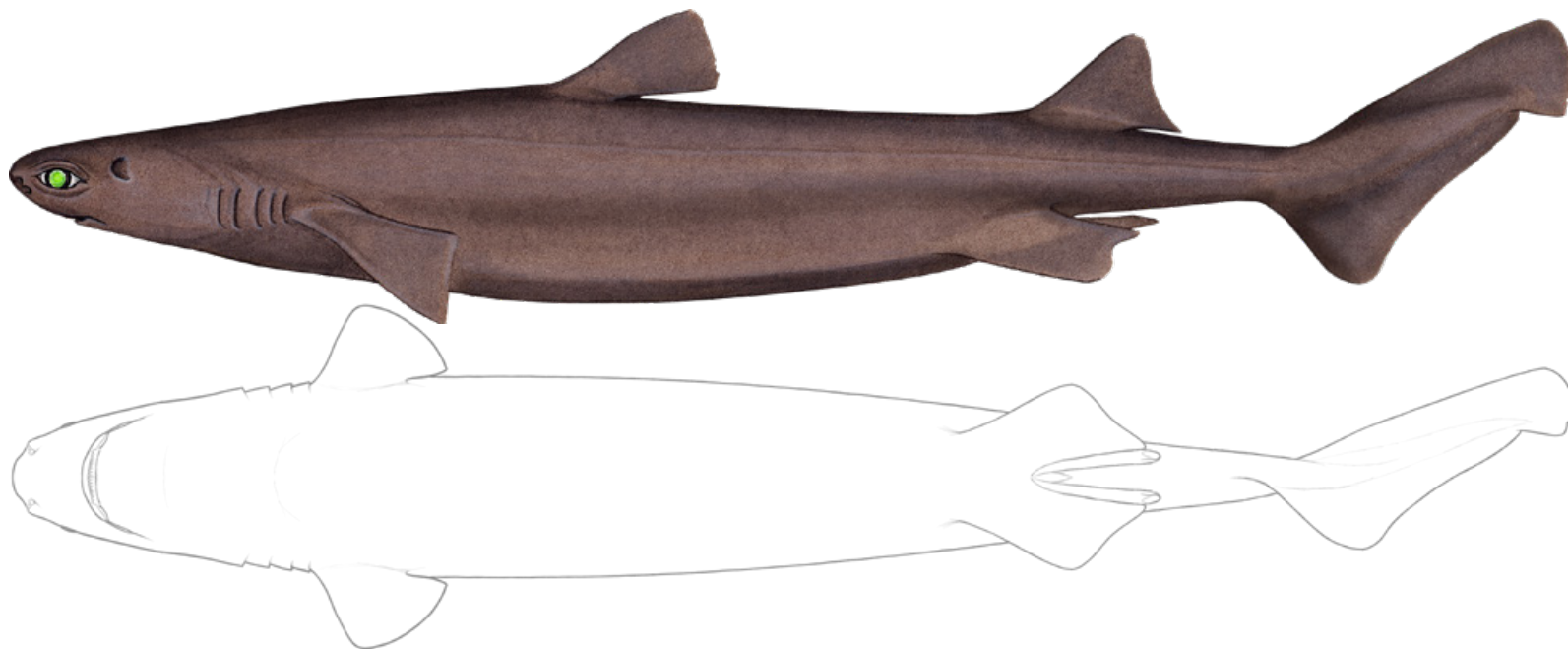
Identification keys **1** **2** **3** **4** **5**

Dark collar around head at gill
First dorsal fin base over pelvic fin origin



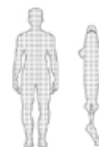
Cantonese: 巴西达摩鲨
French: Squalelet féroce
Japanese: タルマザメ
Korean:
Mandarin: 雪茄鲛 (巴西達摩鯊)
Spanish: Tollo cigarro





Cantonese: 鰐鯊
 French: Squale liche
 Japanese: ヨロイザメ
 Korean:
 Mandarin: 黑鮫 (黑豬罐)
 Spanish: Carocho

No dark collar around head
 First dorsal well in front of pelvic fin
 Dorsal fins of equal size without spines



Identification keys **1** **2** **3** **4** **5**

Dalatias licha

Black shark, kitefin shark

Dalatiidae: Kitefin sharks

SCK

Eusphyra blochii

Winghead shark

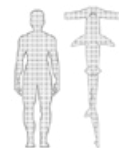
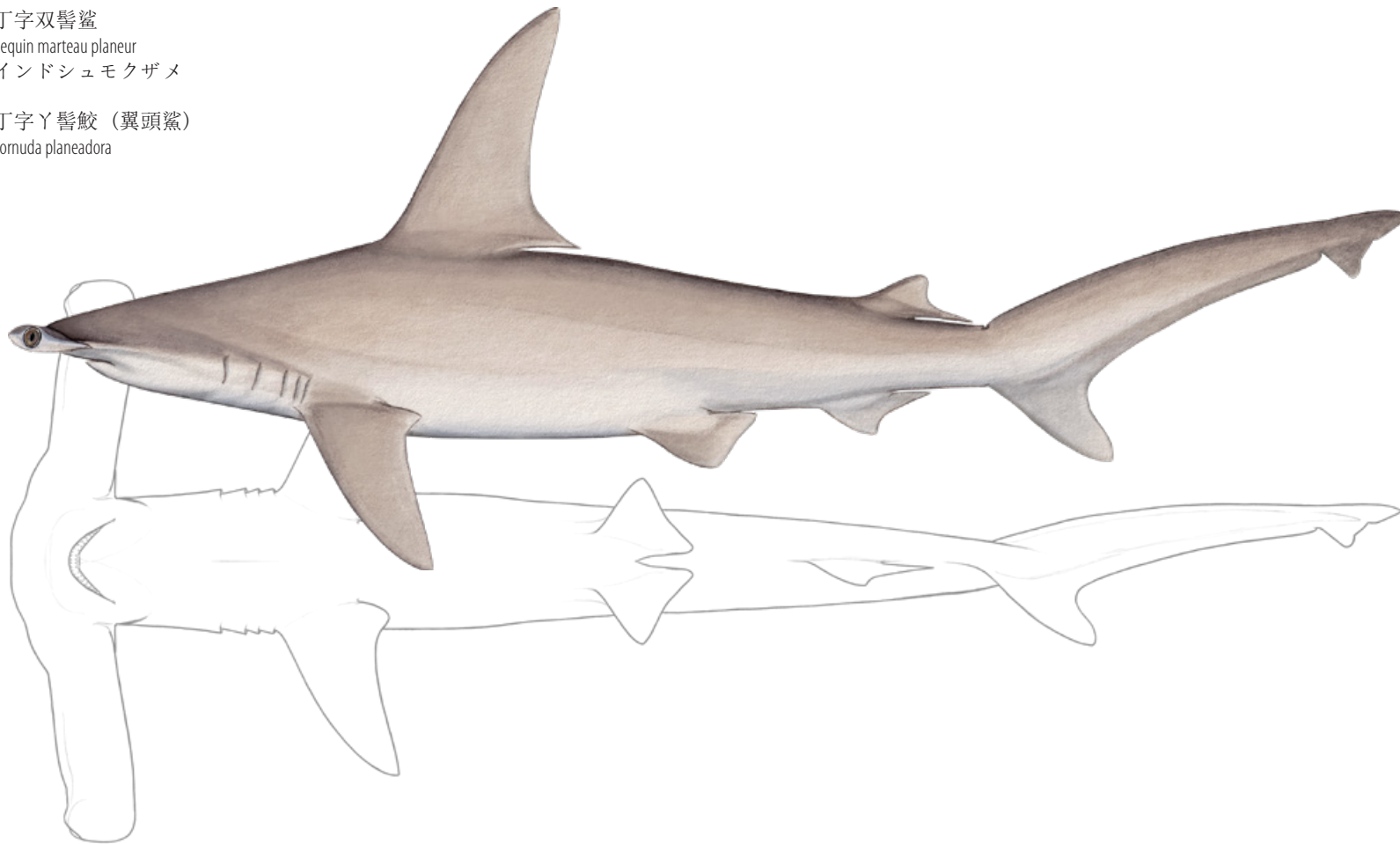
Sphyrnidae: Hammerhead sharks

EUB

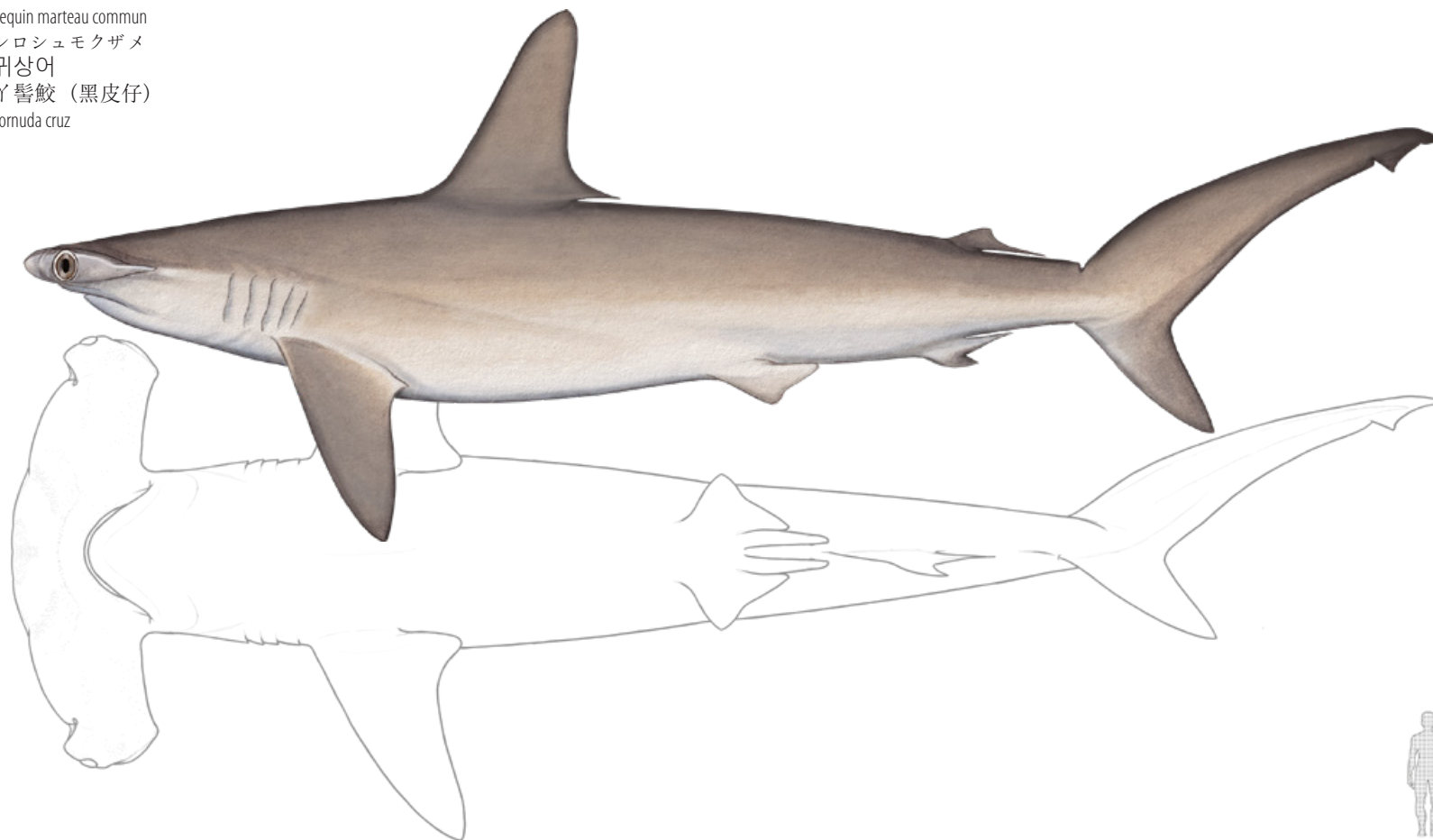
Identification keys **1** **2** **3** **6** **7**

Lateral blades of head very long, narrow and wing-like
Head width almost half of total length

Cantonese: 丁字双髻鲨
French: Requin marteau planeur
Japanese: インドシュモクザメ
Korean:
Mandarin: 丁字丫髻鲨 (翼头鲨)
Spanish: Cornuda planeadora



Cantonese: 锤头双髻鲨
French: Requin marteau commun
Japanese: シロシュモクザメ
Korean: 귀상어
Mandarin: 丫髻鲨 (黑皮仔)
Spanish: Cornuda cruz



Front profile of head convex with lateral indentations and no middle indentation

Identification keys **1 2 3 6 7 8**

Sphyrna zygaena

Smooth hammerhead

Sphyrnidae: Hammerhead sharks

SPZ

Sphyrna lewini

Scalloped hammerhead

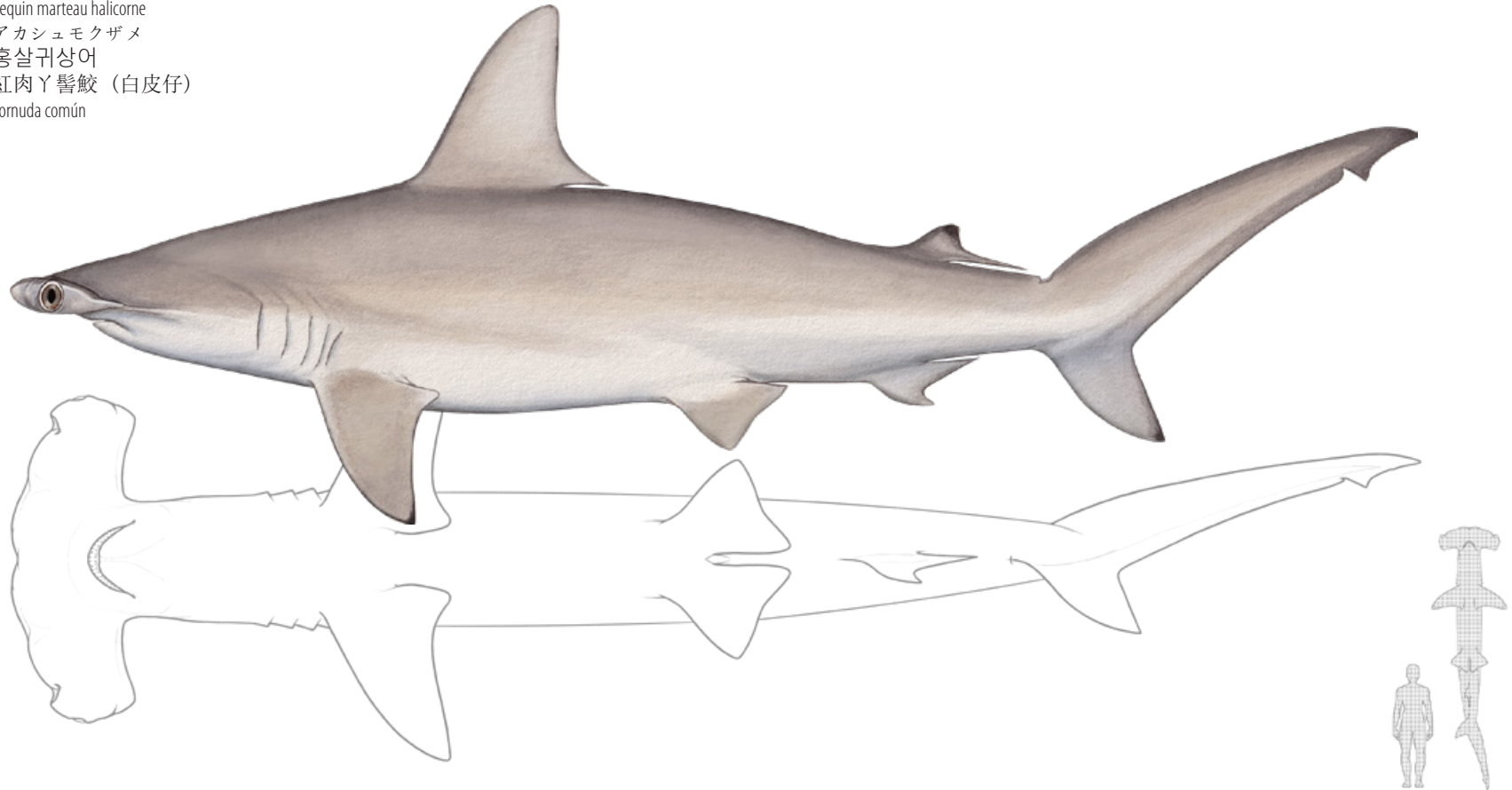
Sphyrnidae: Hammerhead sharks

SPL

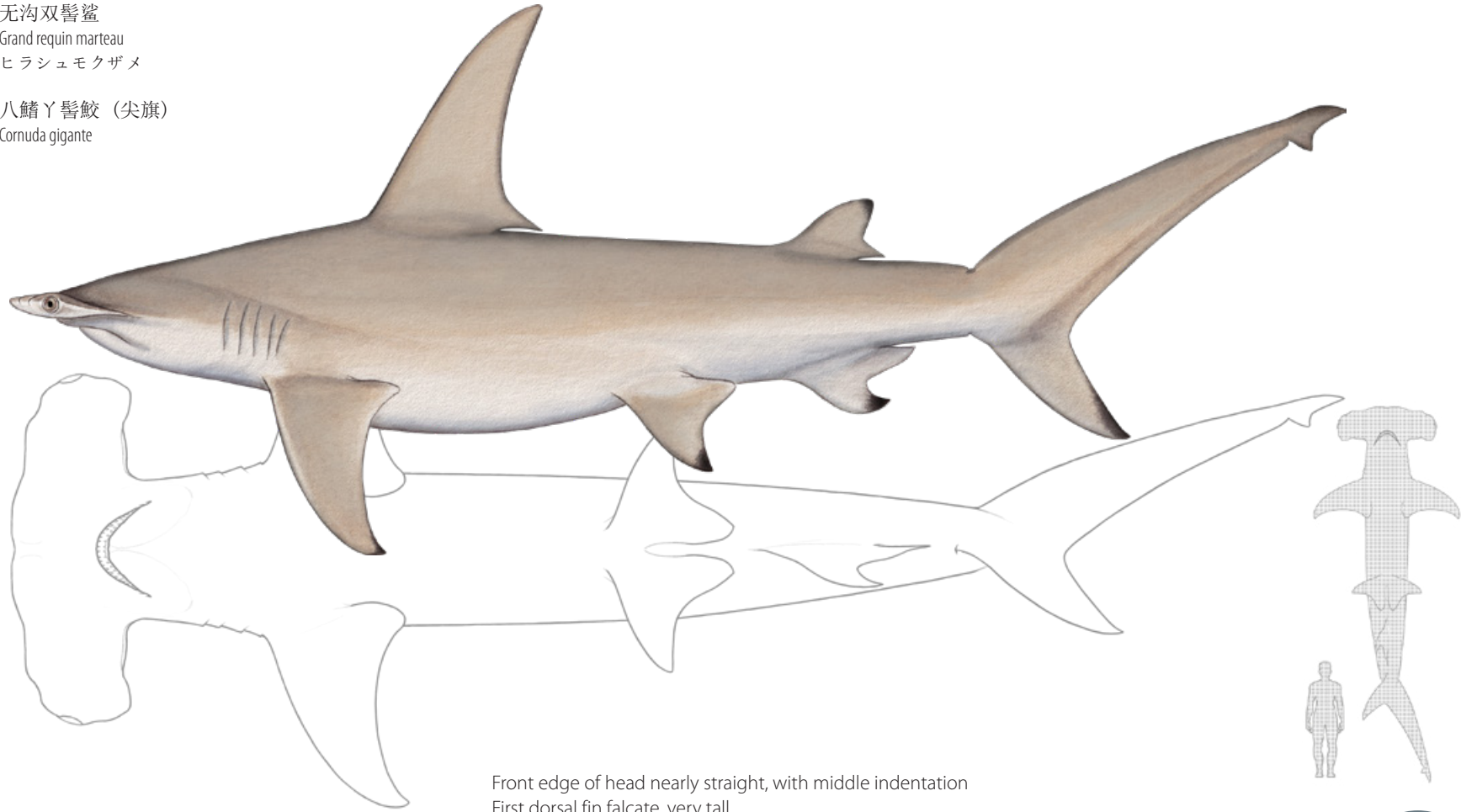
Identification keys **1** **2** **3** **6** **7** **8** **9**

Front of head convex with a middle and paired lateral indentations
First dorsal fin semi-falcate, only moderately high
Pelvic fins with straight posterior edges

Cantonese: 路氏双髻鲨
French: Requin marteau halicorne
Japanese: アカシュモクザメ
Korean: 홍살귀상어
Mandarin: 紅肉丫髻鯊 (白皮仔)
Spanish: Cornuda común



Cantonese: 无沟双髻鲨
 French: Grand requin marteau
 Japanese: ヒラシユモクザメ
 Korean:
 Mandarin: 八鳍Y髻鲨 (尖旗)
 Spanish: Cornuda gigante



Front edge of head nearly straight, with middle indentation
 First dorsal fin falcate, very tall
 Pelvic fins with concave posterior edges

Identification keys **1** **2** **3** **6** **7** **8** **9**

Sphyrna mokarran

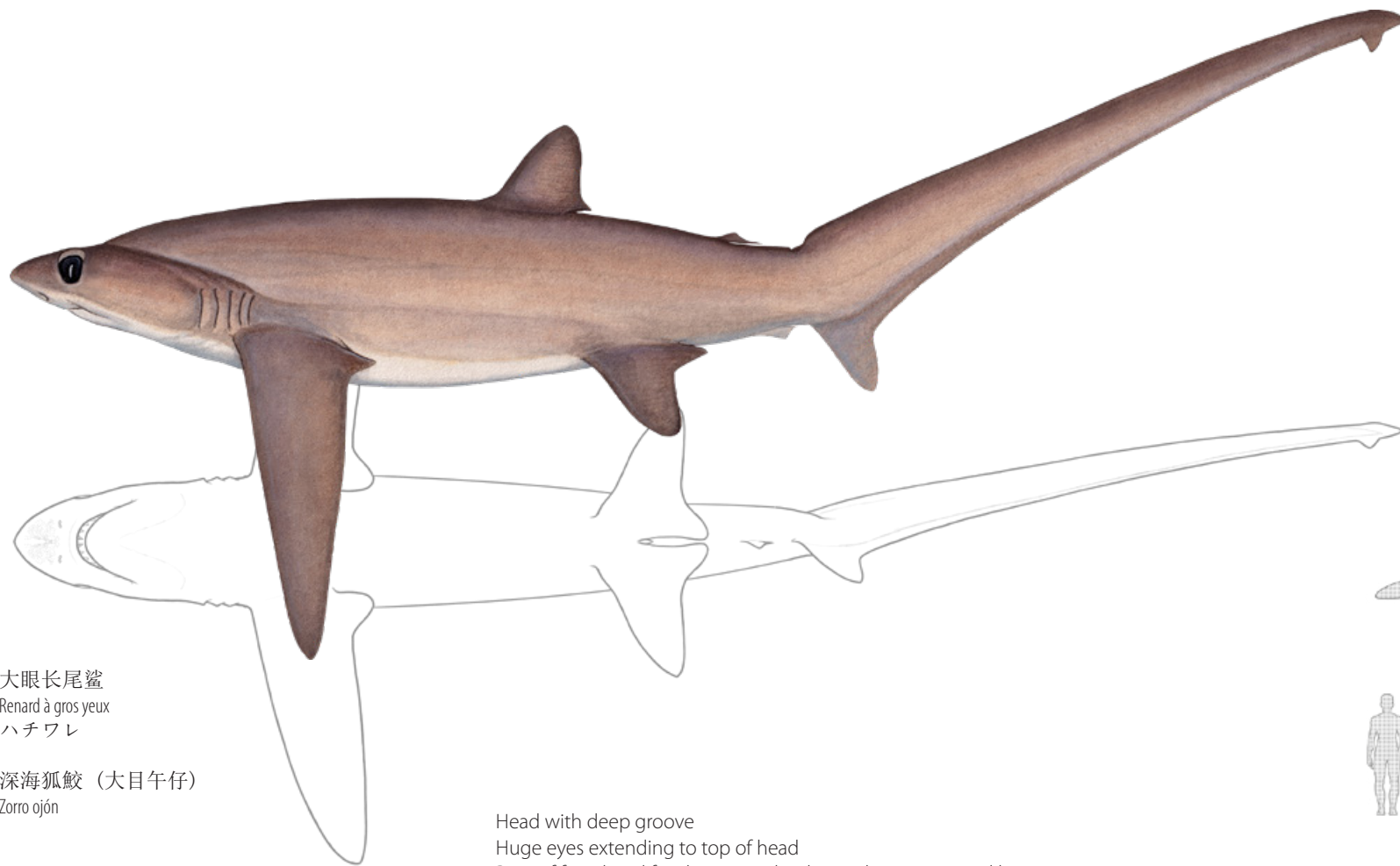
Great hammerhead

Sphyrnidae: Hammerhead sharks

SPK



Bigeye thresher (*Alopias superciliosus*), © Jason Arnold



Cantonese: 大眼长尾鲨
French: Renard à gros yeux
Japanese: ハチワレ
Korean:
Mandarin: 深海狐鲛 (大目午仔)
Spanish: Zorro ojón

Head with deep groove
Huge eyes extending to top of head
Base of first dorsal fin closer to pelvic bases than to pectoral bases

Identification keys 1 2 3 6 10 11

Alopias superciliosus

Bigeye thresher

Alopiidae: Thresher sharks

BTH

Alopias pelagicus

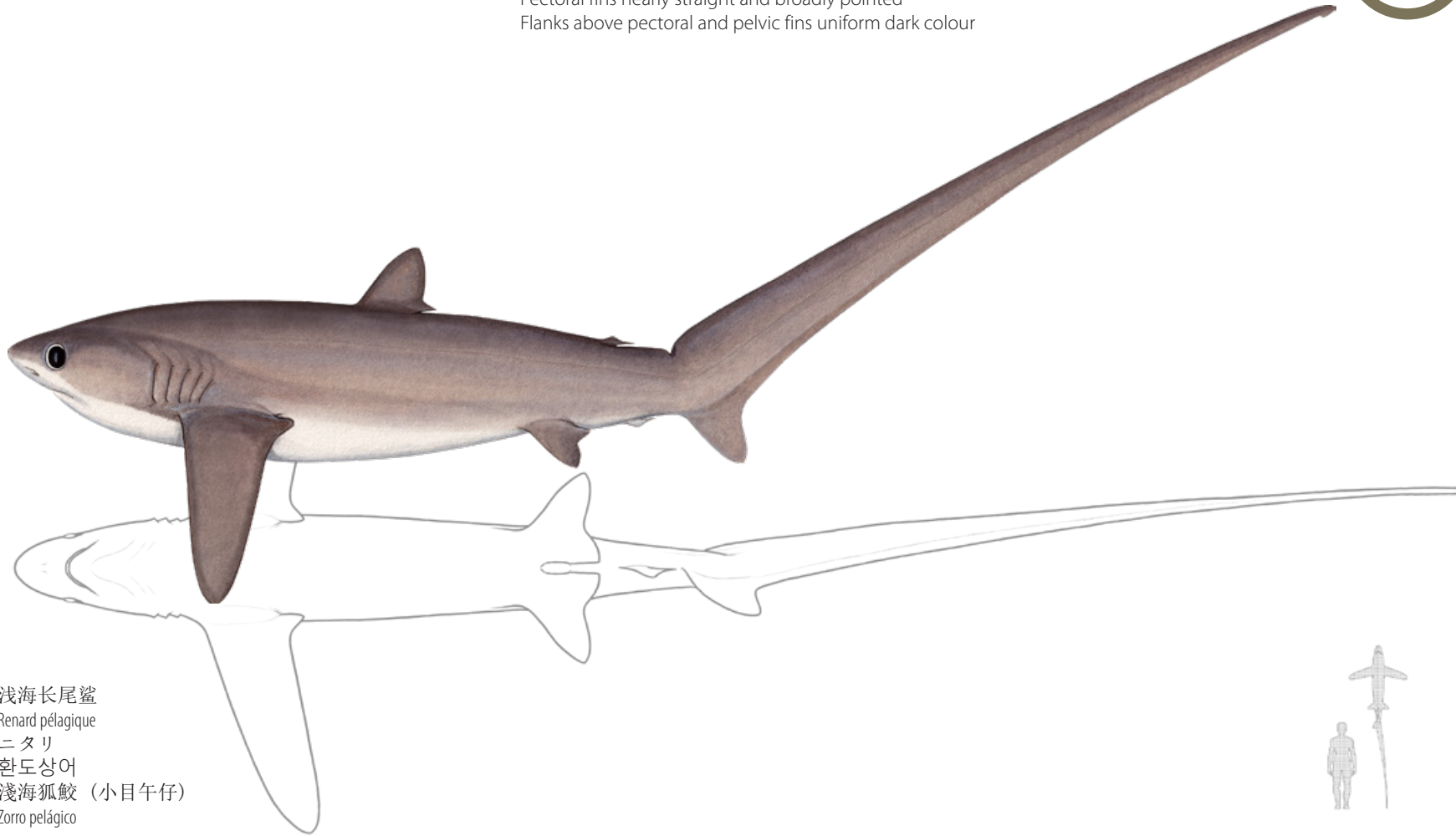
Pelagic thresher

Alopiidae: Thresher sharks

PTH

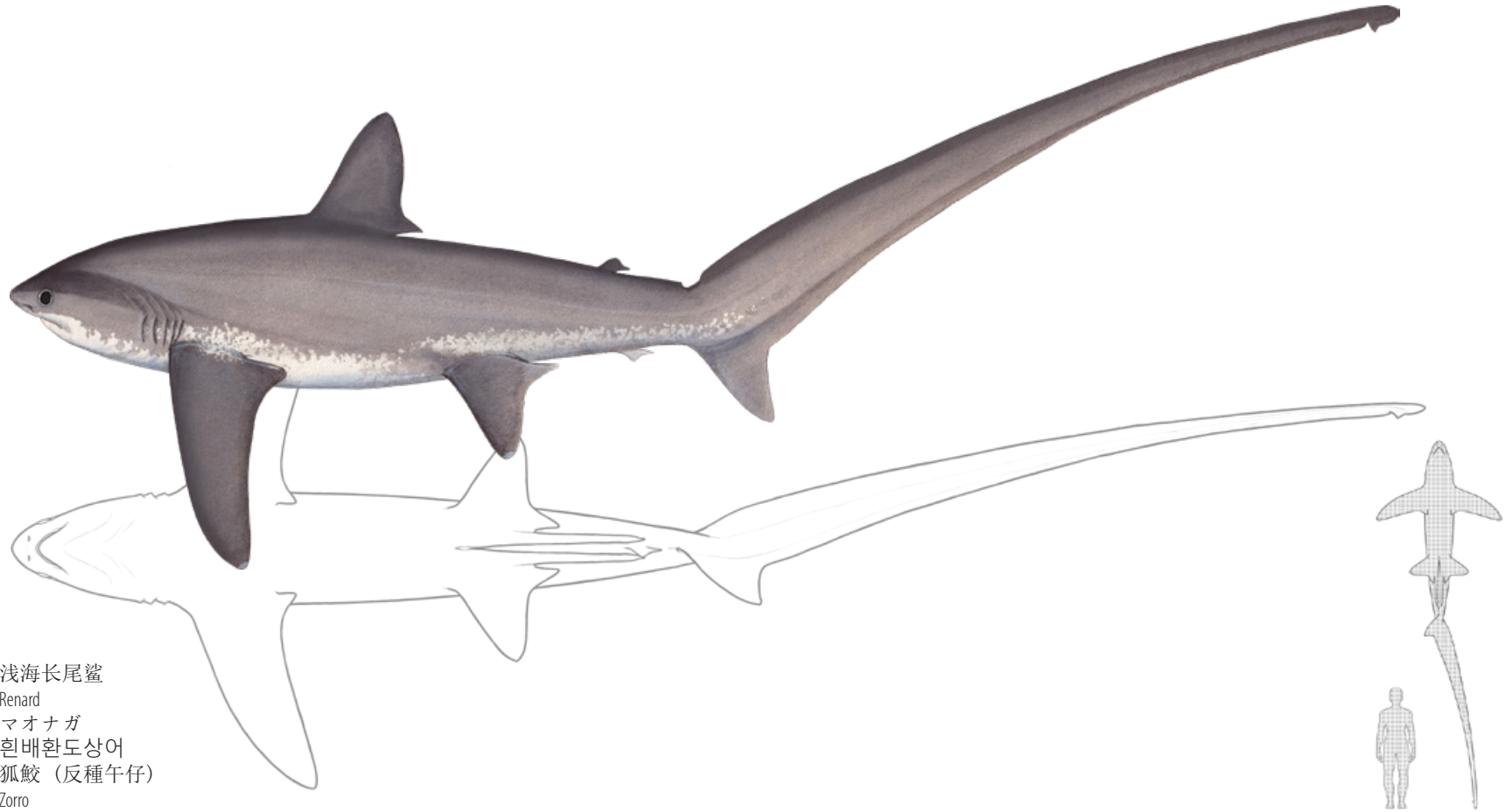
Identification keys **1** **2** **3** **6** **10** **11** **12**

Pectoral fins nearly straight and broadly pointed
Flanks above pectoral and pelvic fins uniform dark colour



Cantonese: 浅海长尾鲨
French: Renard pélagique
Japanese: ニタリ
Korean: 환도상어
Mandarin: 浅海狐鲛 (小目午仔)
Spanish: Zorro pelágico





Cantonese: 浅海长尾鲨
 French: Renard
 Japanese: マオナガ
 Korean: 흰배환도상어
 Mandarin: 狐鮫 (反種午仔)
 Spanish: Zorro

Pectoral fins curved and sharply pointed
 White ventral colour extends to flanks above pectoral and pelvic fins base

Identification keys **1** **2** **3** **6** **10** **11** **12**

Alopias vulpinus

Thresher shark

Alopiidae: Thresher sharks

ALV



Rhincodon typus

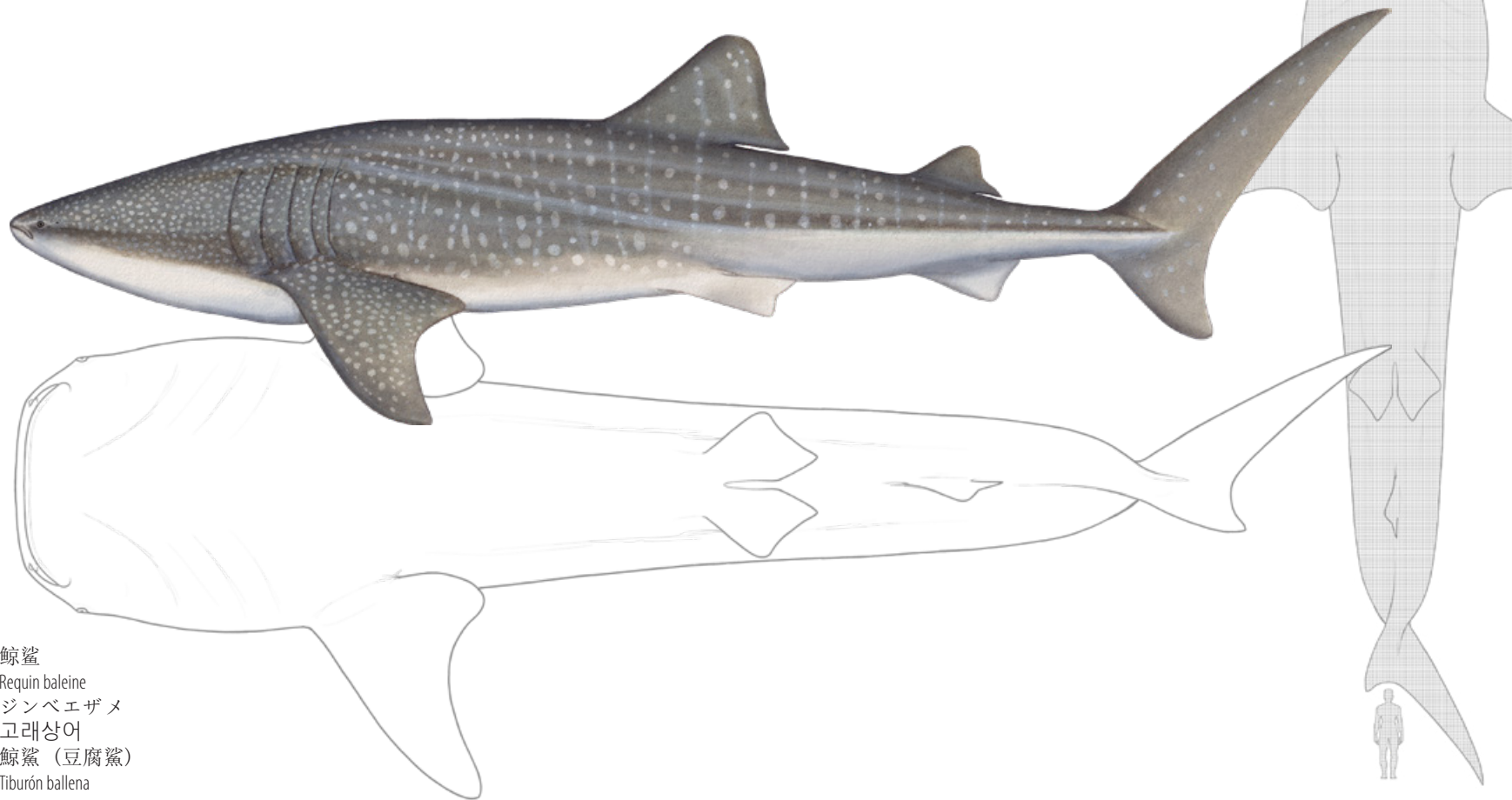
Whale shark

Rhincodontidae: Whale sharks

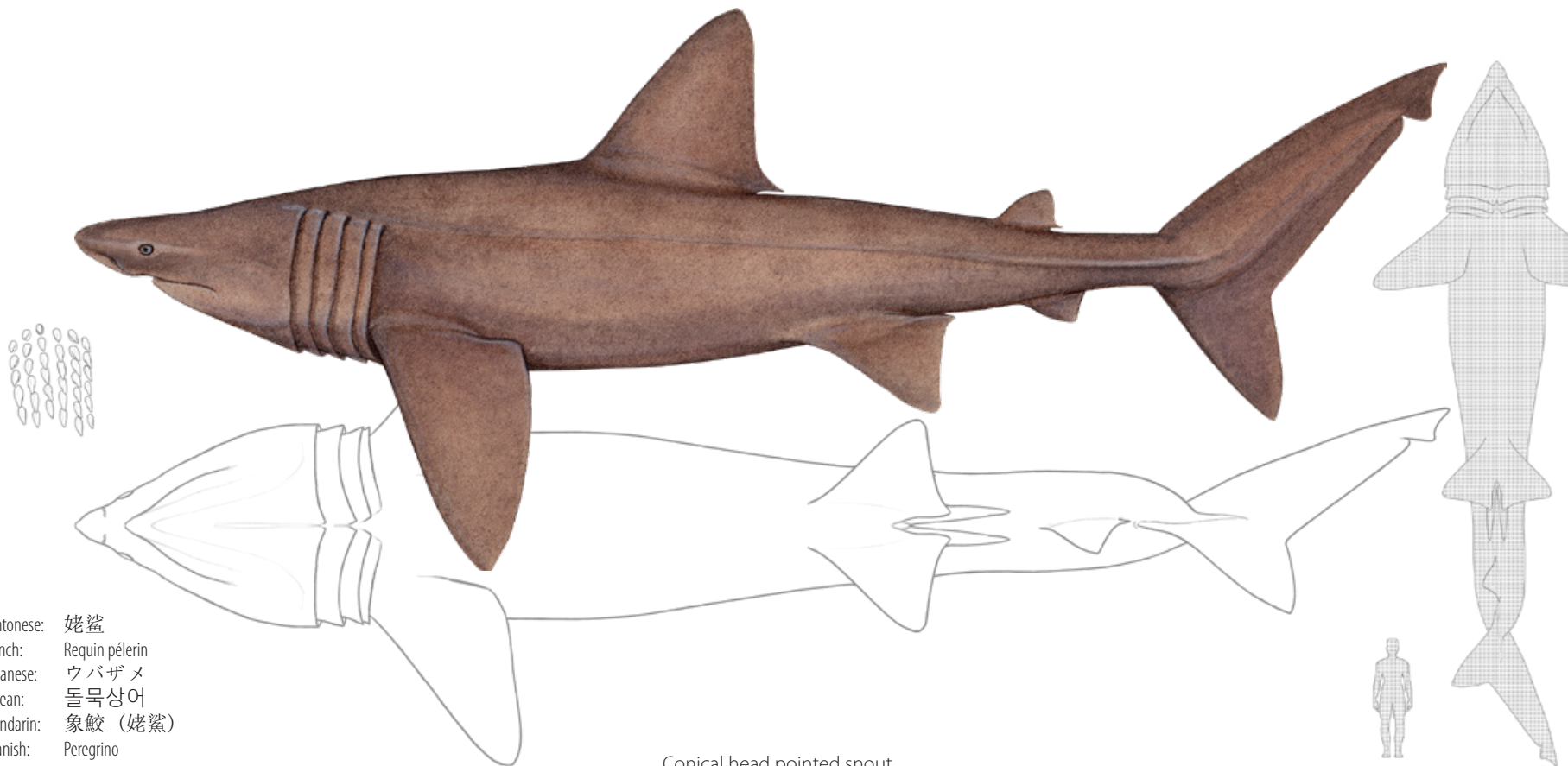
Identification keys 1 2 3 6 10 13

RHN

Broad, flat head with a wide terminal mouth
Clear pattern of light spots and vertical stripes



Cantonese: 鯨鯊
French: Requin baleine
Japanese: ジンベエザメ
Korean: 고래상어
Mandarin: 鯨鯊 (豆腐鯊)
Spanish: Tiburón ballena



Cantonese: 姥鯊
 French: Requin pélerin
 Japanese: ウバザメ
 Korean: 들목상어
 Mandarin: 象鯨 (姥鯊)
 Spanish: Peregrino

Conical head pointed snout
 Very small teeth
 Huge gill slits extending almost around head

Identification keys **1** **2** **3** **6** **10** **13** **14** **15**

Cetorhinus maximus

Basking shark

Cetorhinidae: Basking sharks



Carcharodon carcharias

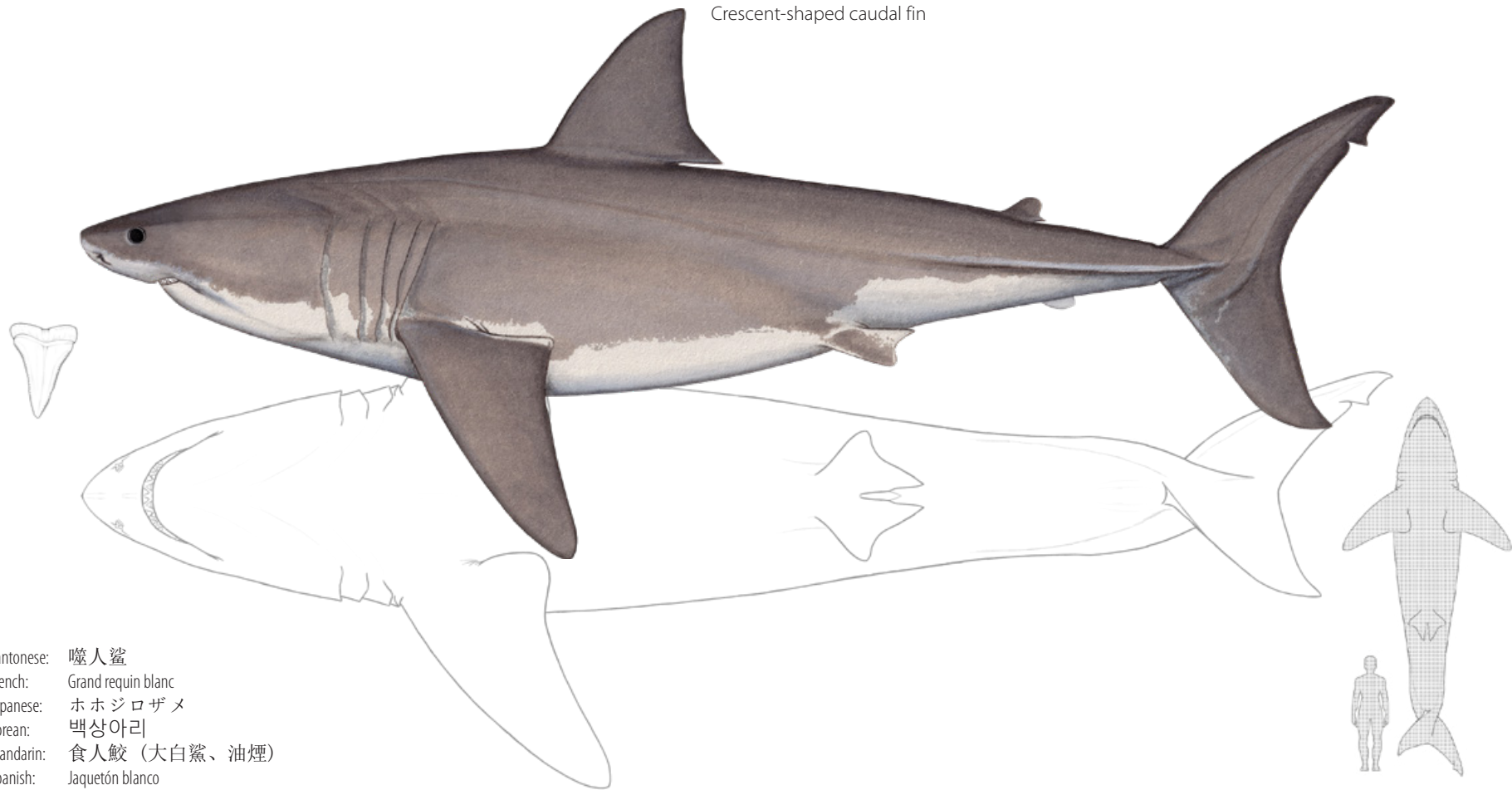
Great white shark

Lamnidae: Mackerel sharks

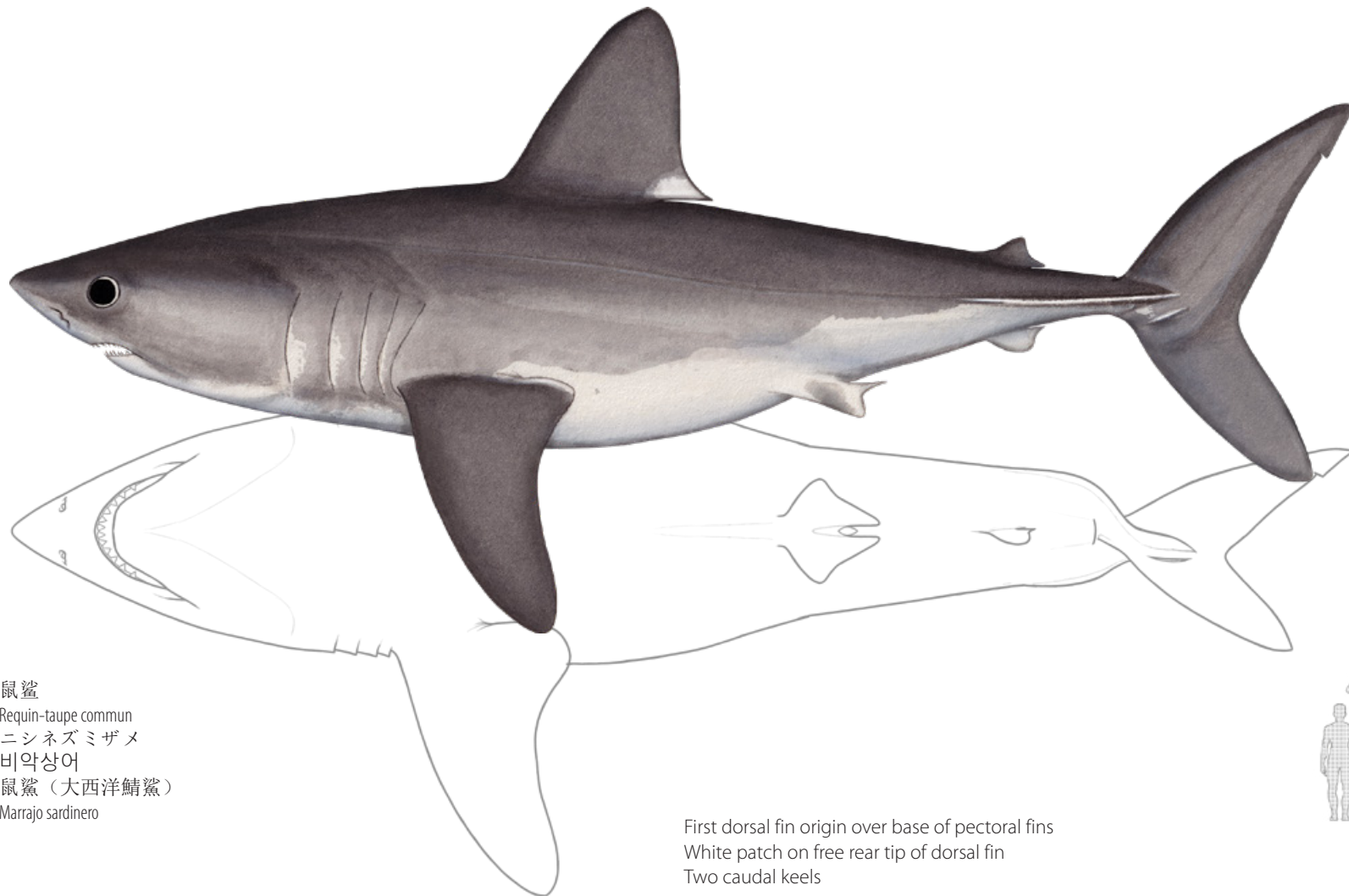
WSH

Identification keys 1 2 3 6 10 13 14 15 16

Large serrated triangular teeth
Grey dorsal colour with distinct change to white below
Crescent-shaped caudal fin

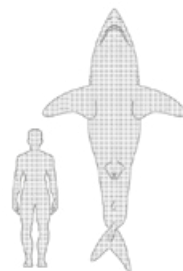


Cantonese: 噬人鯊
French: Grand requin blanc
Japanese: ホホジロザメ
Korean: 백상아리
Mandarin: 食人鯊 (大白鯊、油煙)
Spanish: Jaquetón blanco



Cantonese: 鼠鯊
 French: Requin-taupe commun
 Japanese: ニシネズミザメ
 Korean: 비악상어
 Mandarin: 鼠鯊 (大西洋鯖鯊)
 Spanish: Marrajo sardinero

First dorsal fin origin over base of pectoral fins
 White patch on free rear tip of dorsal fin
 Two caudal keels



Identification keys **1** **2** **3** **6** **10** **13** **14** **15** **16** **17**

Lamna nasus

Porbeagle shark

Lamnidae: Mackerel sharks

POR

Isurus oxyrinchus

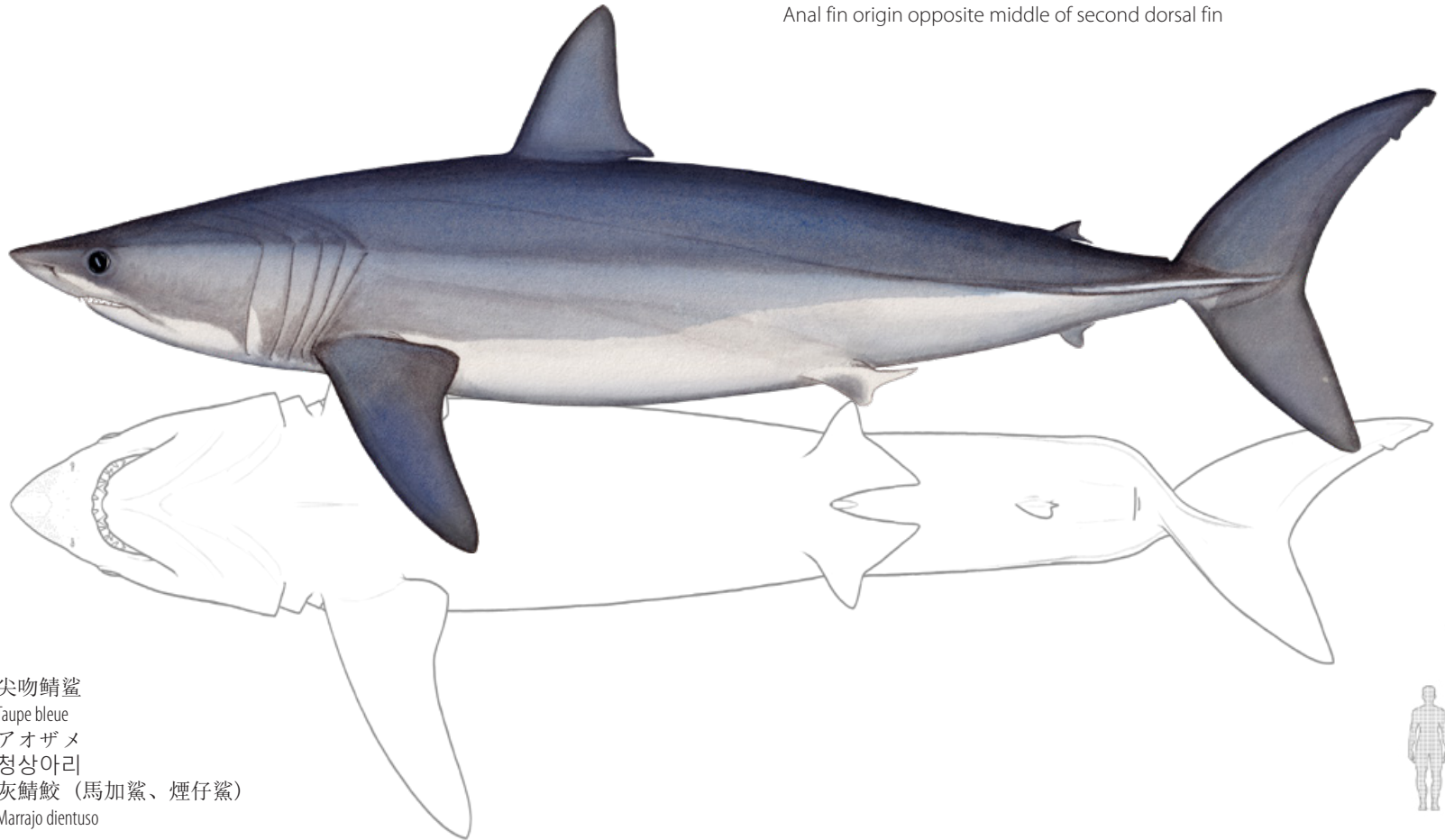
Shortfin mako shark

Lamnidae: Mackerel sharks

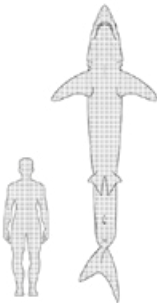
Identification keys [1](#) [2](#) [3](#) [6](#) [10](#) [13](#) [14](#) [15](#) [16](#) [17](#) [18](#)

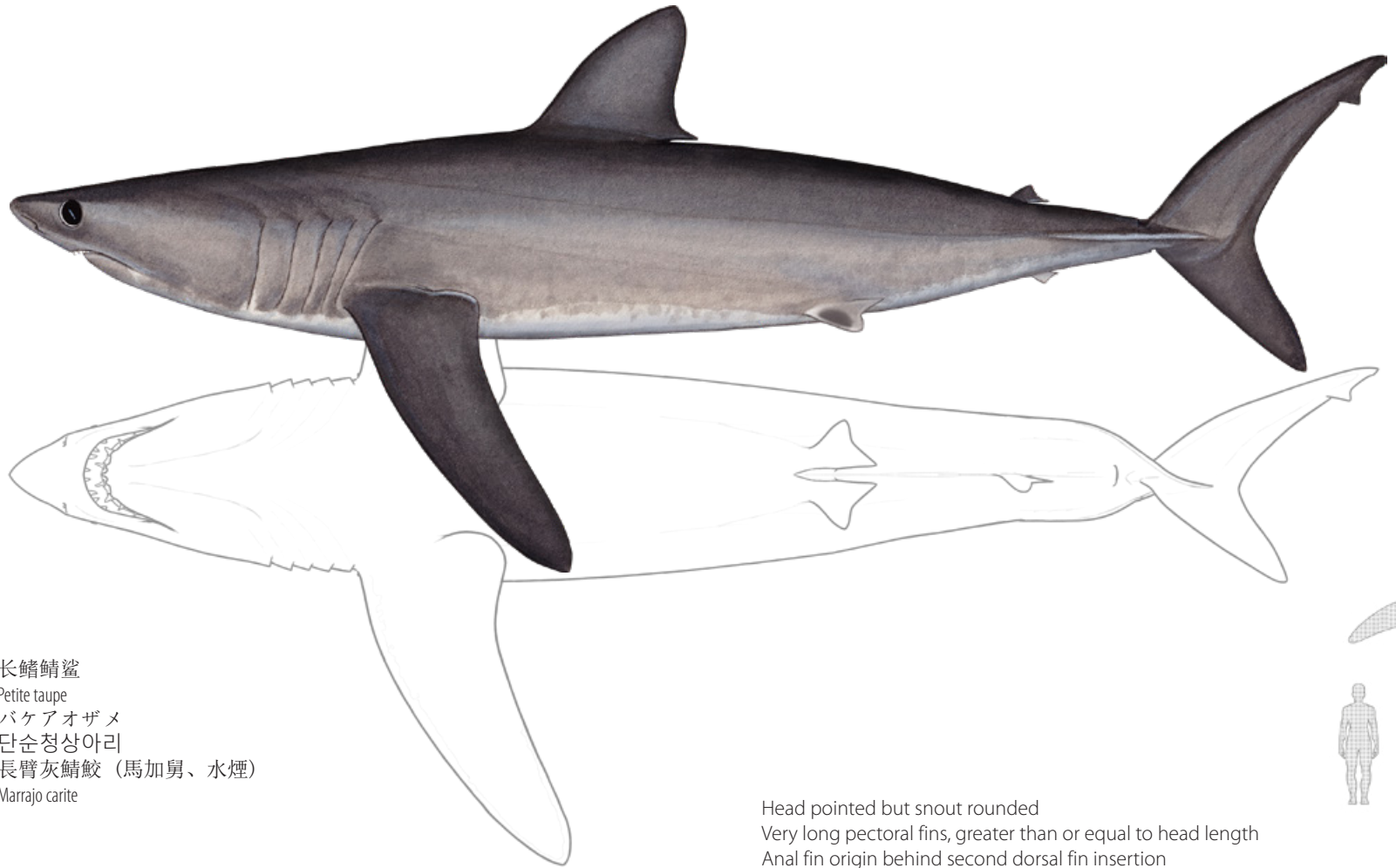
SMA

Head and snout pointed
Brilliant blue above and silvery sides
Pectoral fins shorter than head length
Anal fin origin opposite middle of second dorsal fin



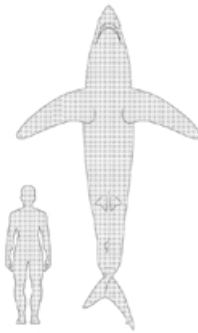
Cantonese: 尖吻鯖鯊
French: Taupe bleue
Japanese: アオザメ
Korean: 청상아리
Mandarin: 灰鯖鯊 (馬加鯊、煙仔鯊)
Spanish: Marrajo dentuso





Cantonese: 长鳍鯖鲨
French: Petite taupe
Japanese: バケアオザメ
Korean: 단순청상아리
Mandarin: 长臂灰鯖鲛 (馬加舅、水煙)
Spanish: Marrajo carite

Head pointed but snout rounded
Very long pectoral fins, greater than or equal to head length
Anal fin origin behind second dorsal fin insertion



Identification keys 1 2 3 6 10 13 14 15 16 17 18

Isurus paucus

Longfin mako shark

Lamnidae: Mackerel sharks

LMA

Megachasma pelagios

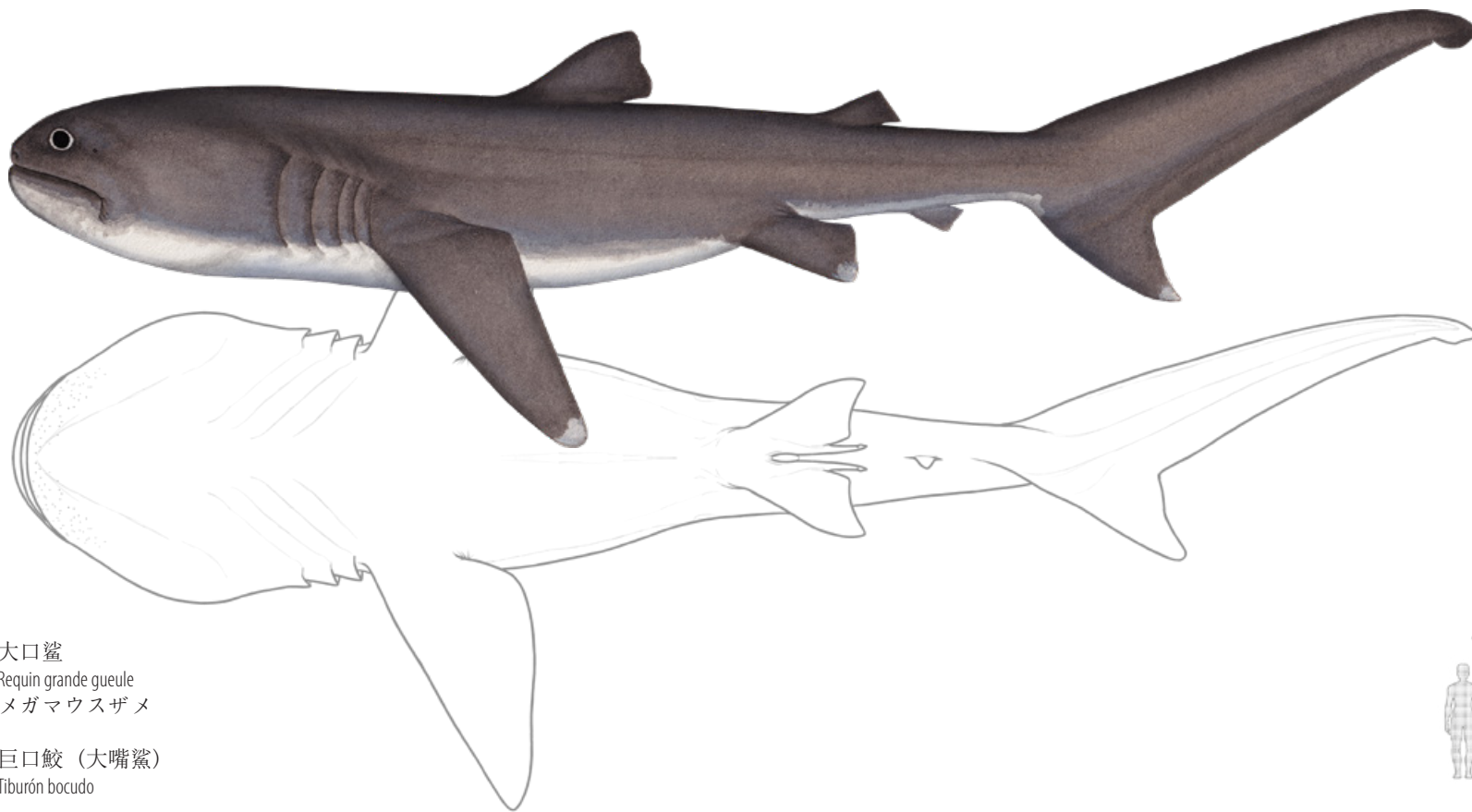
Megamouth shark

Megachasmidae: Megamouth sharks

LMP

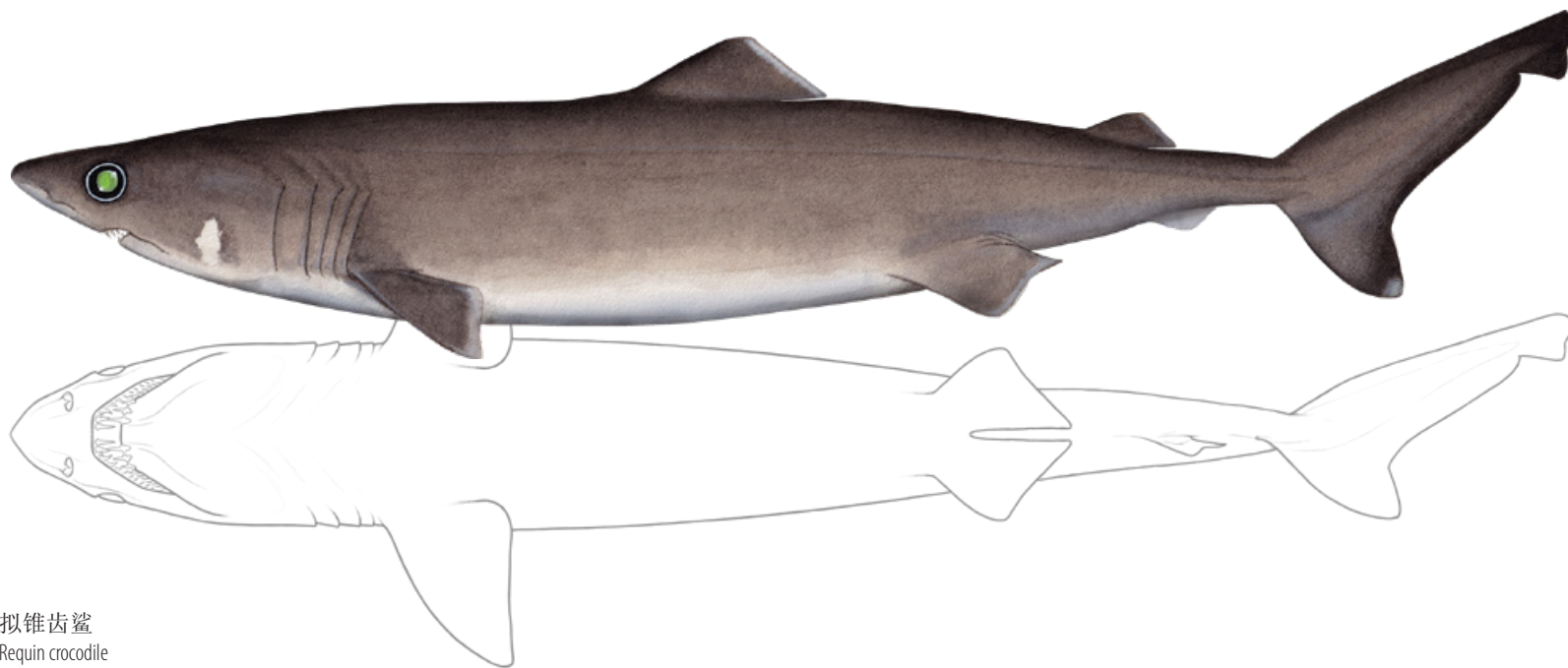
Identification keys 1 2 3 6 10 13 14 19

Large soft head with short, broadly rounded snout
Mouth extending from snout tip to behind eye



Cantonese: 大口鯊
French: Requin grande gueule
Japanese: メガマウスザメ
Korean:
Mandarin: 巨口鮫 (大嘴鯊)
Spanish: Tiburón bocudo





Cantonese: 拟锥齿鲨
 French: Requin crocodile
 Japanese: ミズワニ
 Korean: 강남상어
 Mandarin: 蒲原氏拟锥齿鲨 (猫公、鱷鯊)
 Spanish: Tiburón cocodrilo

Eyes very large
 Long gill slits extending onto dorsal surface of head
 Prominent slender teeth and protrusible jaw

Identification keys **1** **2** **3** **6** **10** **13** **14** **19** **20**

Pseudocarcharias kamoharai

Crocodile shark

Pseudocarchariidae: Crocodile sharks

PSK



Odontaspis noronhai

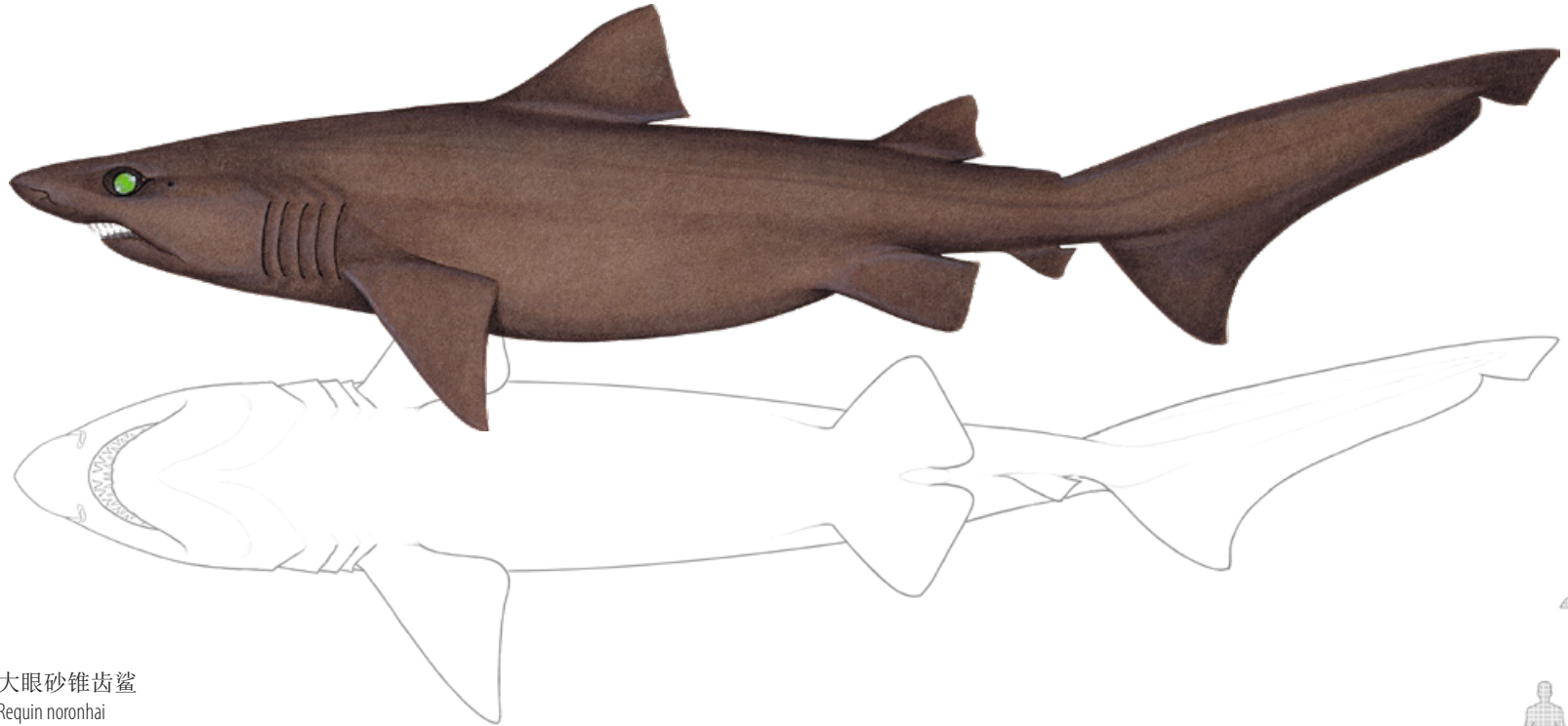
Bigeye sandtiger shark

Odonstapidiidae: Sandtiger sharks

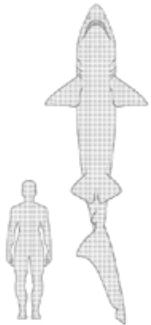
ODH

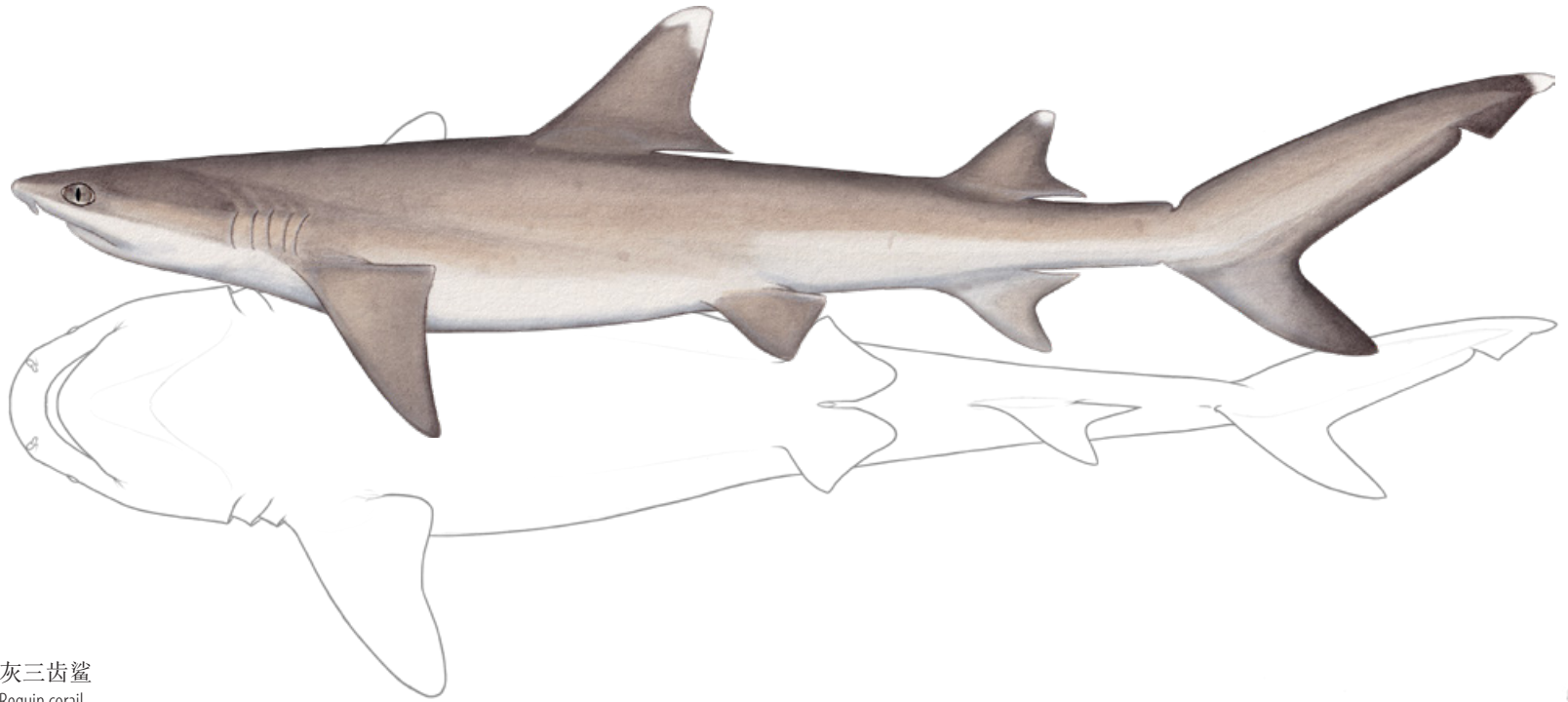
Identification keys 1 2 3 6 10 13 14 19 20 21

Large eyes, no nictitating membrane
First dorsal close to pectoral fin
Second dorsal fin origin over pelvic fin

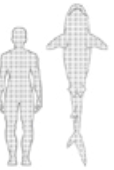


Cantonese: 大眼砂錐齒鯊
French: Requin noronhai
Japanese:
Korean:
Mandarin: 大眼砂錐齒鯊 (漾牙)
Spanish: Solrayo ojigrande





Cantonese: 灰三齒鯊
French: Requin corail
Japanese: ネムリブカ
Korean:
Mandarin: 鬻鯨 (白翅尾仔)
Spanish: Tiburón coralero ñato



Dorsal fins and upper caudal fin with white tips
Height of second dorsal fin greater than or equal to half of first dorsal fin

Identification keys 1 2 3 6 10 13 14 19 20 21 22

Triaenodon obesus

White tip reef shark

Carcharhinidae: Requiem sharks

TRB

Galeocerdo cuvier

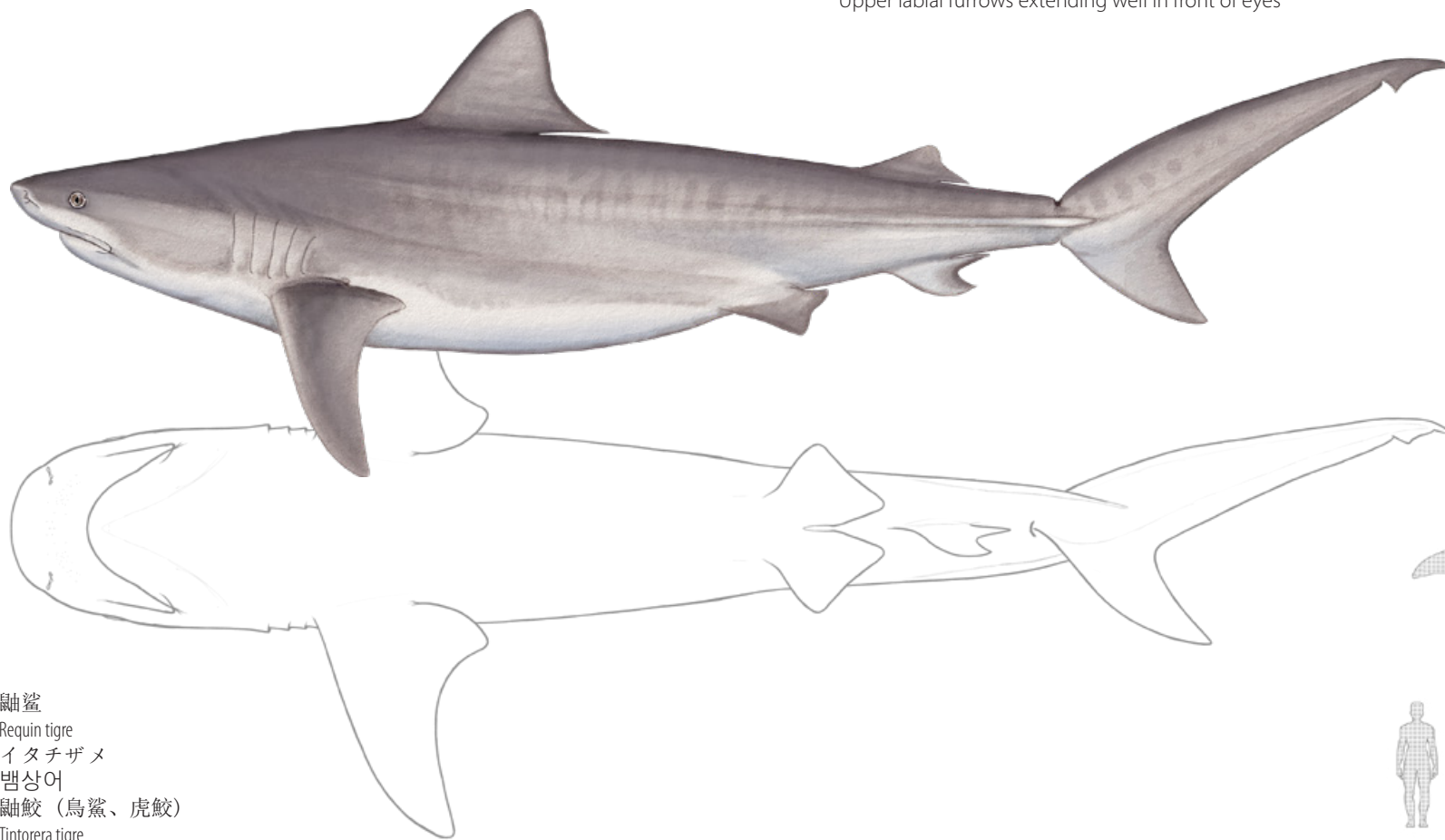
Tiger shark

Carcharhinidae: Requiem sharks

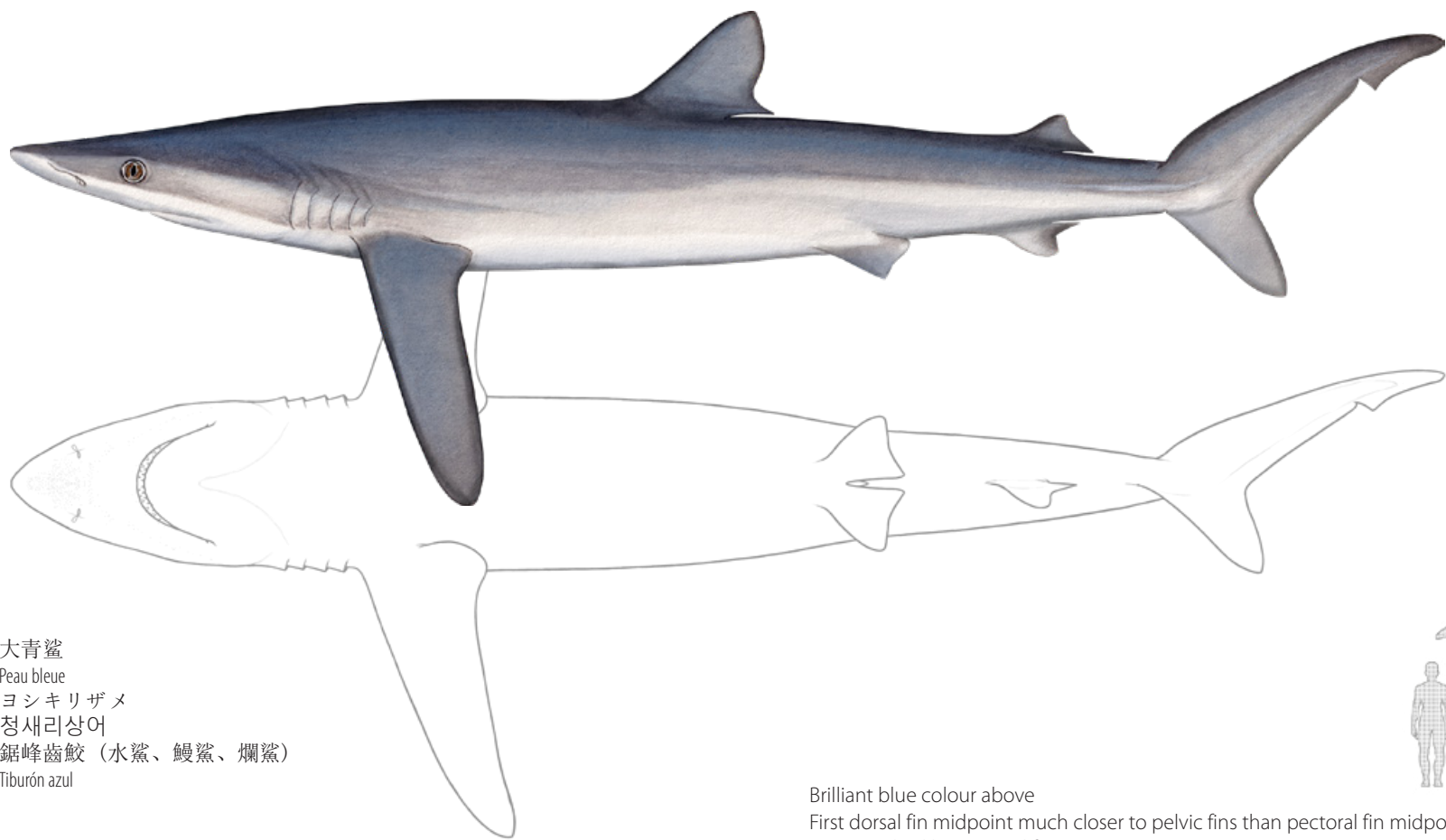
TIG

Identification keys 1 2 3 6 10 13 14 19 20 21 22 23

Tiger-stripe markings, faded in adults
Large broad head; short, broad, rounded snout
Upper labial furrows extending well in front of eyes

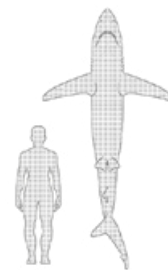


Cantonese: 𩶛鯊
French: Requin tigre
Japanese: イタチザメ
Korean: 뱀상어
Mandarin: 𩶛鯊 (烏鯊、虎鯊)
Spanish: Tintorera tigre



Cantonese: 大青鯊
 French: Peau bleue
 Japanese: ヨシキリザメ
 Korean: 청새리상어
 Mandarin: 鋸峰齒鯊 (水鯊、鰻鯊、爛鯊)
 Spanish: Tiburón azul

Brilliant blue colour above
 First dorsal fin midpoint much closer to pelvic fins than pectoral fin midpoint
 Long scythe-like pectoral fins



Identification keys 1 2 3 6 10 13 14 19 20 21 22 23 24

Prionace glauca

Blue shark

Carcharhinidae: Requiem sharks

BSH

Carcharhinus longimanus

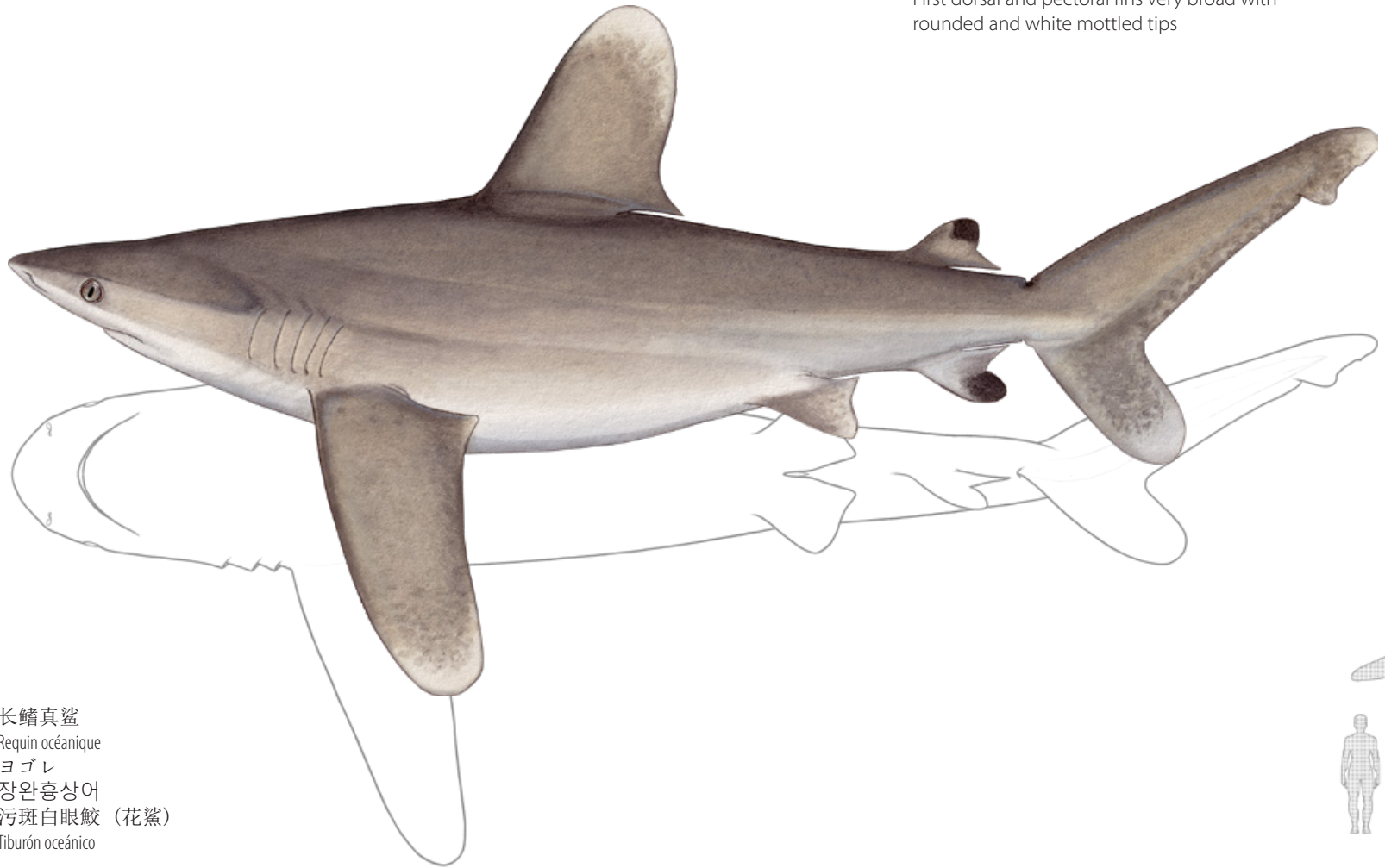
Oceanic whitetip shark

Carcharhinidae: Requiem sharks

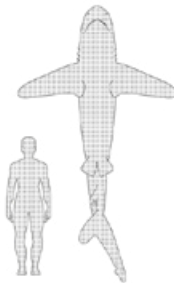
Identification keys 1 2 3 6 10 13 14 19 20 21 22 23 24 25

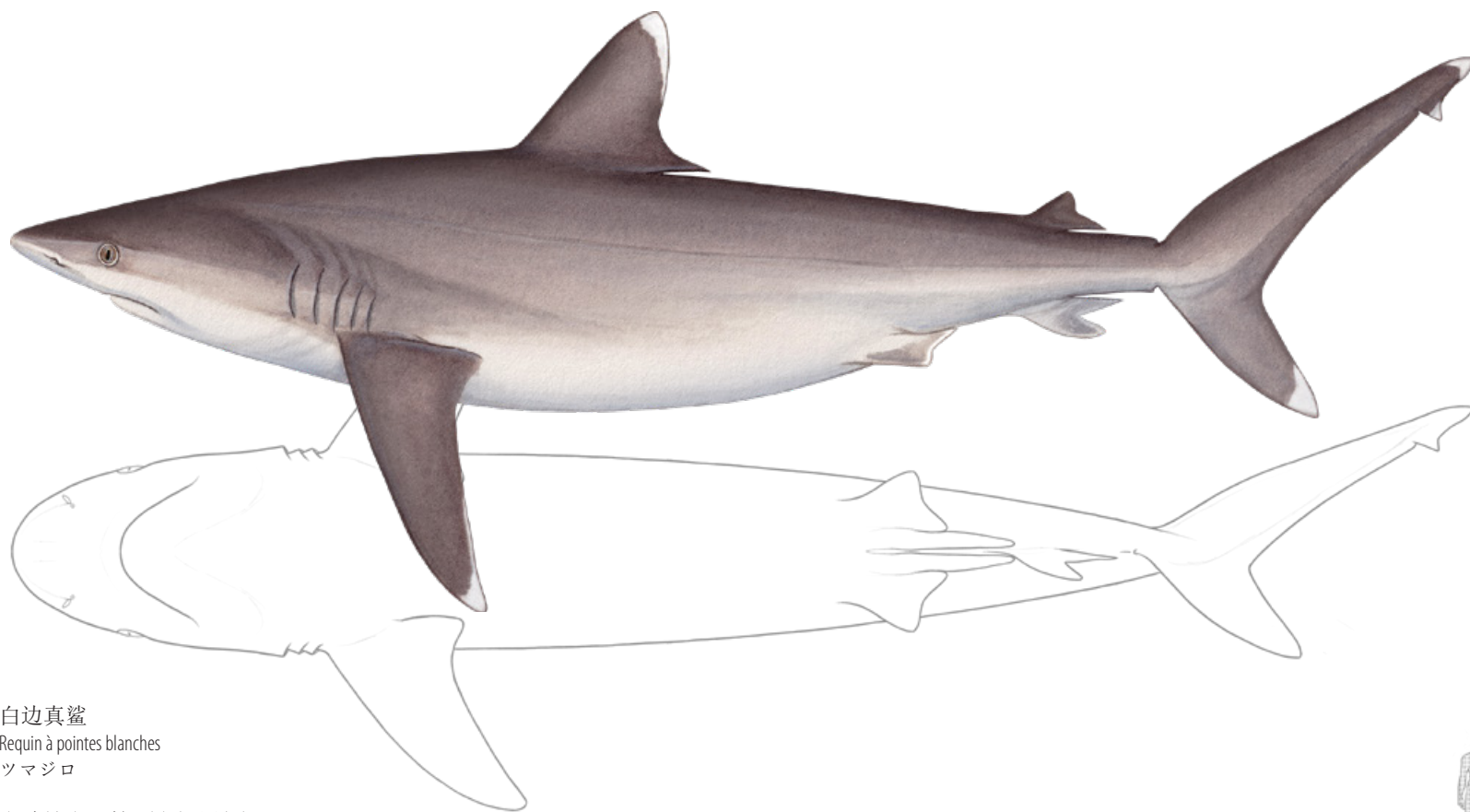
OCS

First dorsal and pectoral fins very broad with rounded and white mottled tips



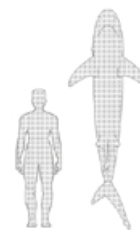
Cantonese: 长鳍真鲨
French: Requin océanique
Japanese: ヨゴレ
Korean: 장완흉상어
Mandarin: 污斑白眼鲛 (花鲨)
Spanish: Tiburón oceánico





Cantonese: 白边真鲨
 French: Requin à pointes blanches
 Japanese: ツマジロ
 Korean:
 Mandarin: 白邊鰭白眼鯊 (白翅尾仔)
 Spanish: Tiburón puntas blancas

First dorsal fin, pectoral, pelvic and caudal fins
 with conspicuous white tips
 Interdorsal ridge present



Identification keys 1 2 3 6 10 13 14 19 20 21 22 23 24 25 26

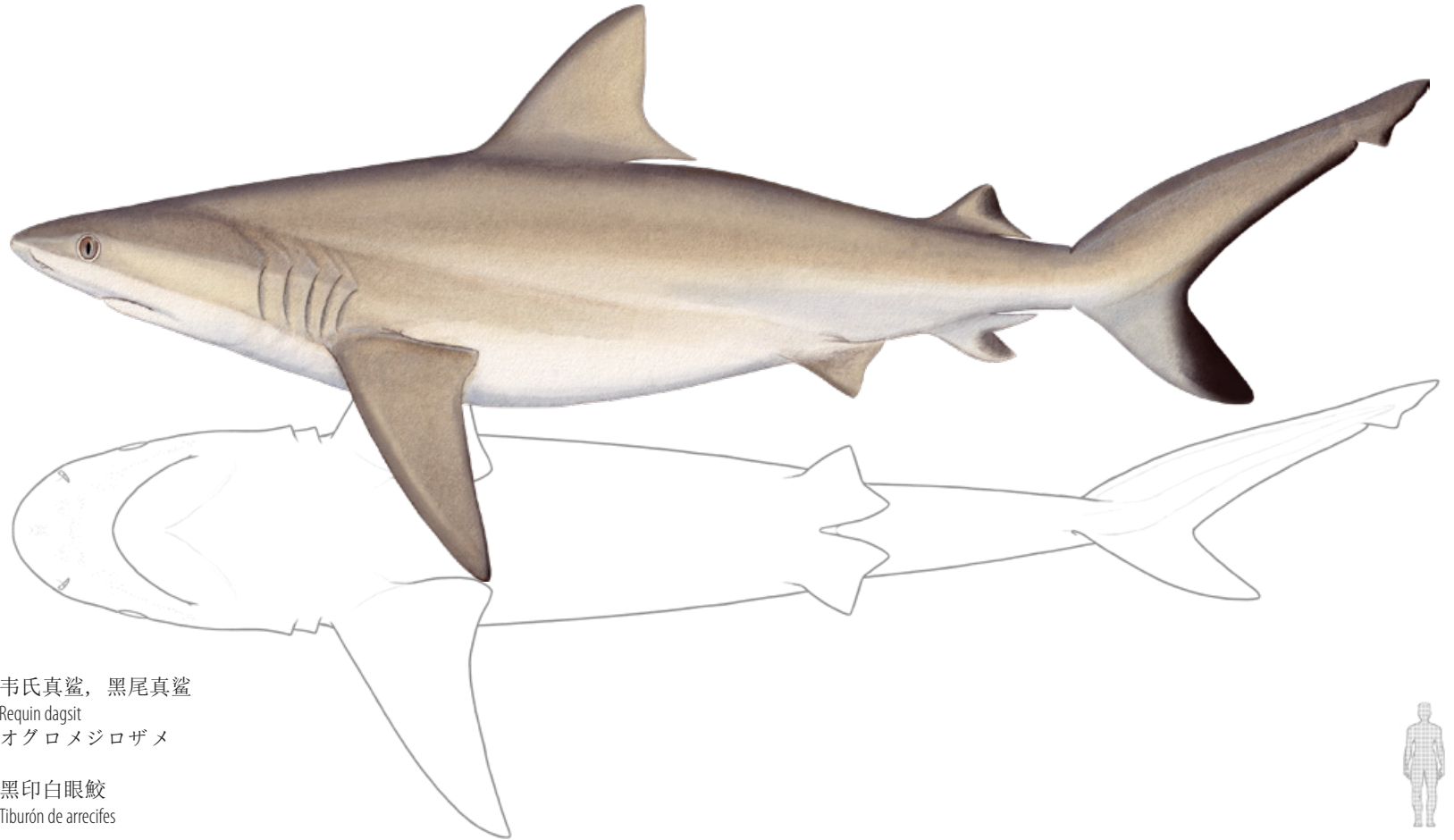
Carcharhinus albimarginatus

Silvertip shark

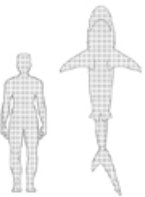
Carcharhinidae: Requiem sharks

ALS





Cantonese: 韦氏真鲨, 黑尾真鲨
 French: Requin dagsit
 Japanese: オグロメジロザメ
 Korean:
 Mandarin: 黑印白眼鲛
 Spanish: Tiburón de arrecifes



No black tip on first dorsal fin
 Caudal fin with prominent posterior black edges

Identification keys **1** **2** **3** **6** **10** **13** **14** **19** **20** **21** **22** **23** **24** **25** **26** **27**

Carcharhinus amblyrhynchos

Grey reef shark

Carcharhinidae: Requiem sharks

AML

Carcharhinus brachyurus

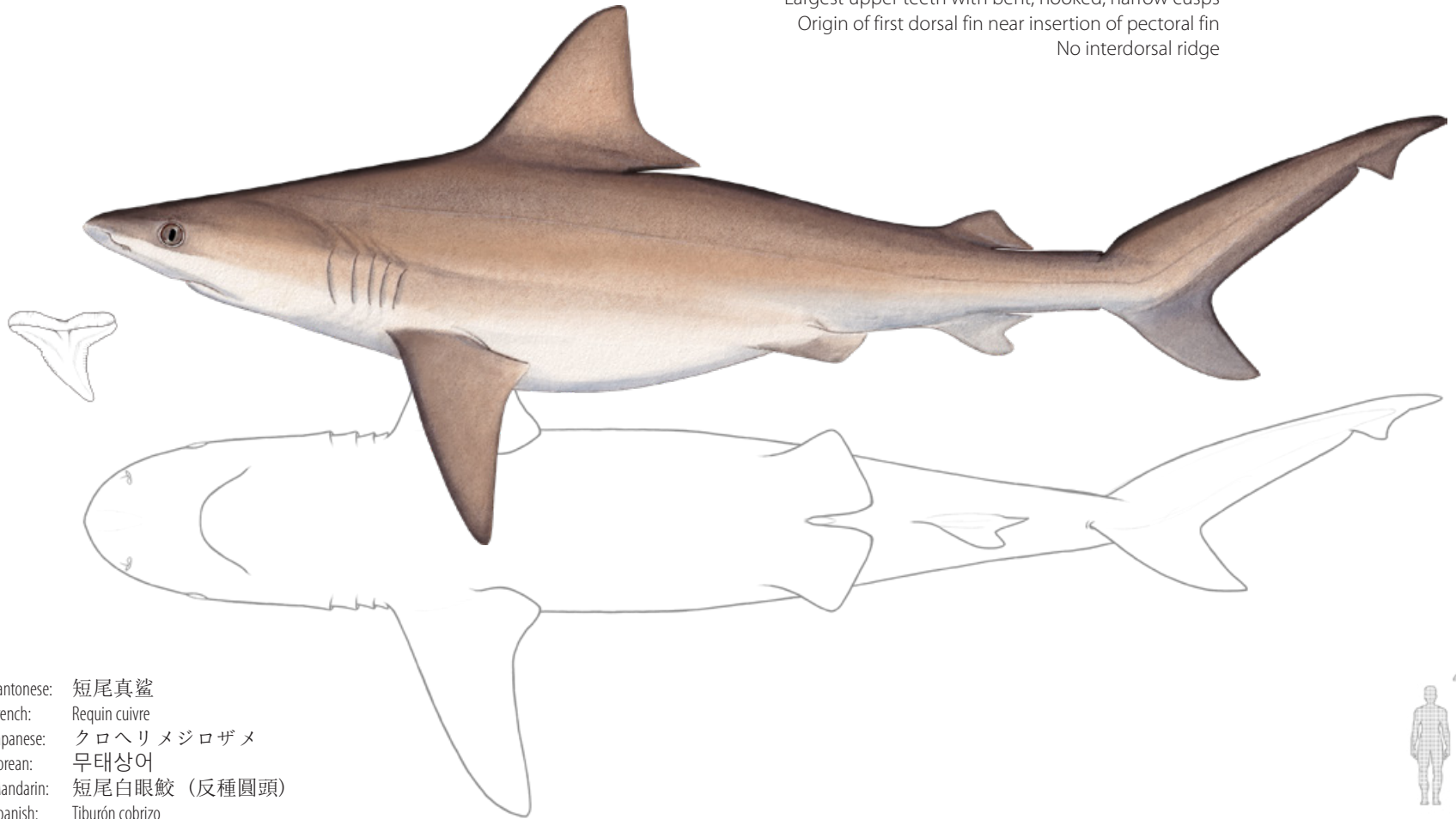
Bronze whaler

Carcharhinidae: Requiem sharks

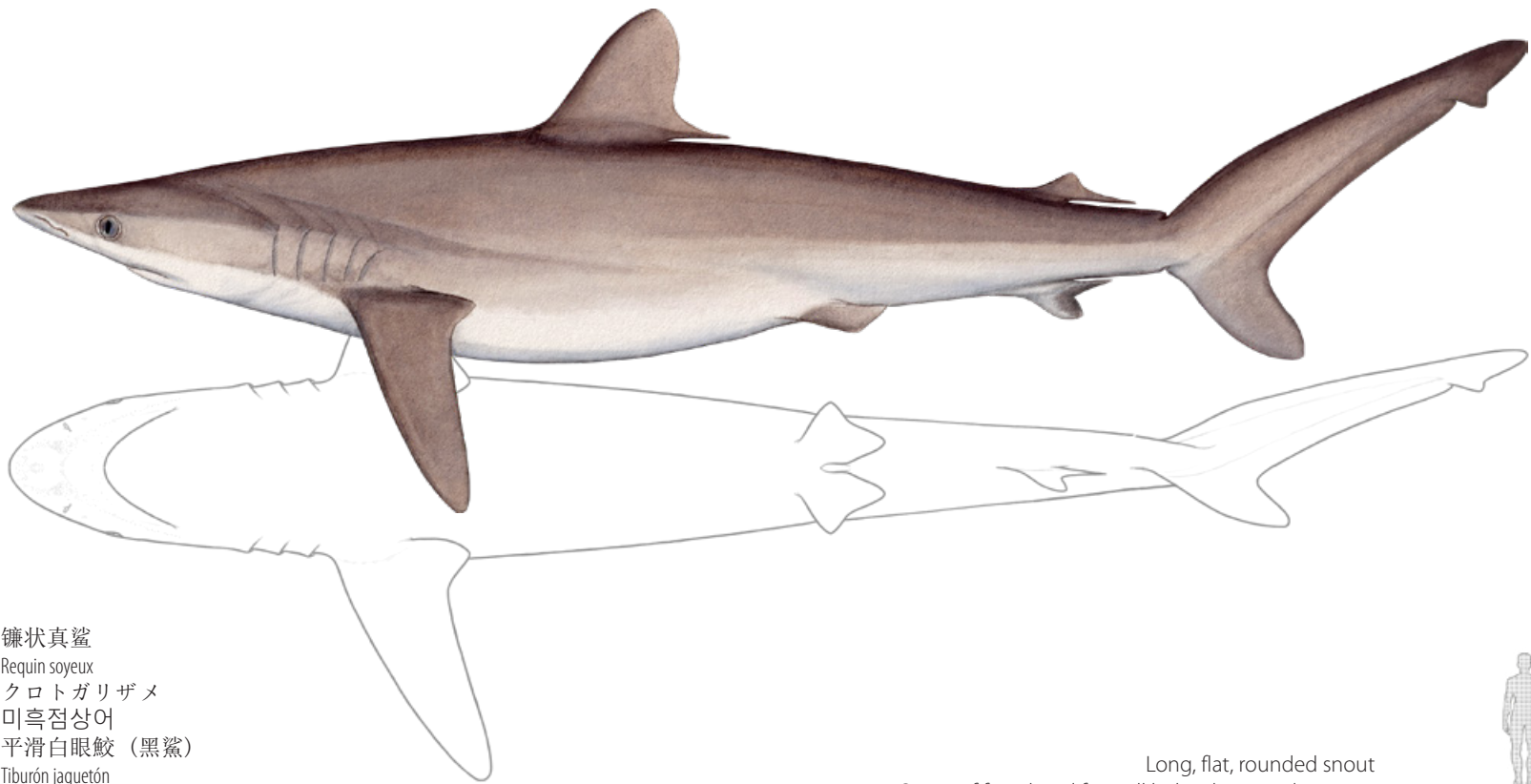
BRO

Identification keys 1 2 3 6 10 13 14 19 20 21 22 23 24 25 26 27 28

Bluntly pointed broad snout
Largest upper teeth with bent, hooked, narrow cusps
Origin of first dorsal fin near insertion of pectoral fin
No interdorsal ridge

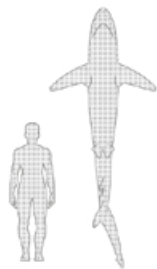


Cantonese: 短尾真鯊
French: Requin cuivre
Japanese: クロヘリメジロザメ
Korean: 무태상어
Mandarin: 短尾白眼鯊 (反種圓頭)
Spanish: Tiburón cobrizo



Cantonese: 镰状真鲨
 French: Requin soyeux
 Japanese: クロトガリザメ
 Korean: 미흑점상어
 Mandarin: 平滑白眼鲛 (黑鲨)
 Spanish: Tiburón jaquetón

Long, flat, rounded snout
 Origin of first dorsal fin well behind pectoral rear tips
 Narrow interdorsal ridge
 Second dorsal free rear tip very long



Identification keys 1 2 3 6 10 13 14 19 20 21 22 23 24 25 26 27 28 29 30

Carcharhinus falciformis

Silky shark

Carcharhinidae: Requiem sharks

FAL

Carcharhinus plumbeus

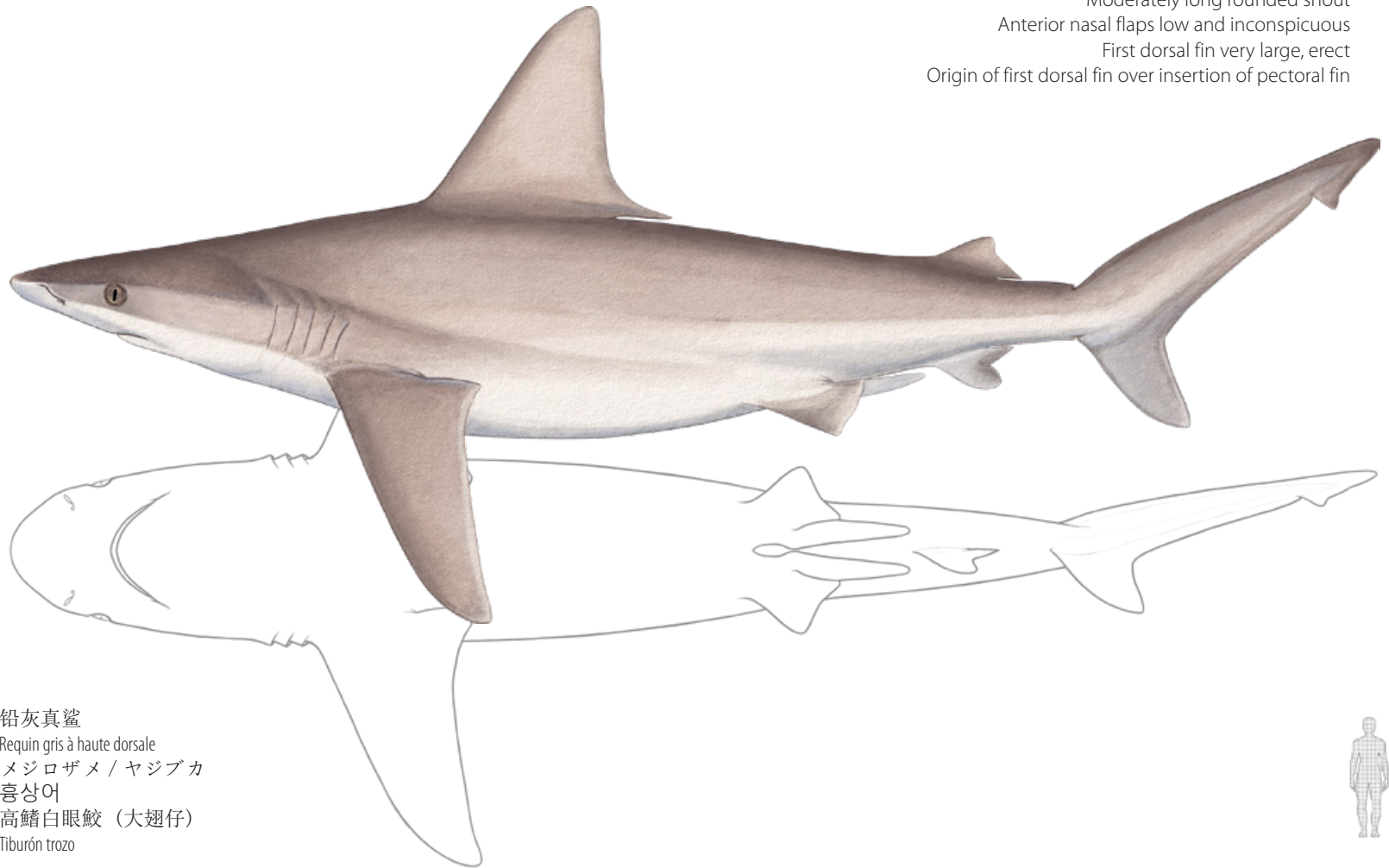
Sandbar shark

Carcharhinidae: Requiem sharks

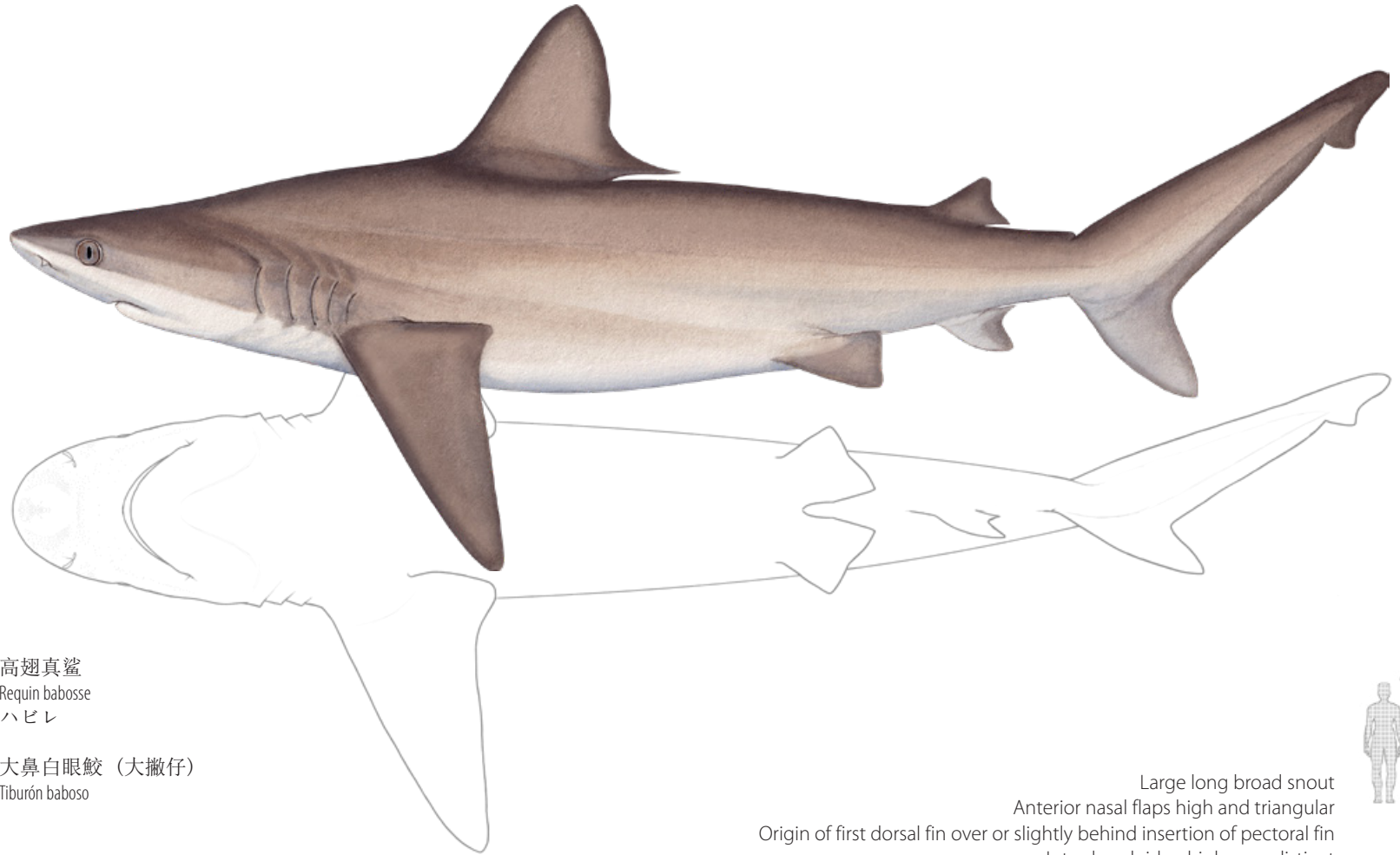
Identification keys 1 2 3 6 10 13 14 19 20 21 22 23 24 25 26 27 28 29 30 31 32

CCP

Moderately long rounded snout
Anterior nasal flaps low and inconspicuous
First dorsal fin very large, erect
Origin of first dorsal fin over insertion of pectoral fin

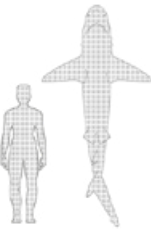


Cantonese: 铅灰真鲨
French: Requin gris à haute dorsale
Japanese: メジロザメ / ヤジブカ
Korean: 흥상어
Mandarin: 高鳍白眼鲛 (大翅仔)
Spanish: Tiburón trozo



Cantonese: 高翅真鲨
 French: Requin babosse
 Japanese: ハビレ
 Korean:
 Mandarin: 大鼻白眼鲛 (大撒仔)
 Spanish: Tiburón baboso

Large long broad snout
 Anterior nasal flaps high and triangular
 Origin of first dorsal fin over or slightly behind insertion of pectoral fin
 Interdorsal ridge high, very distinct



Identification keys 1 2 3 6 10 13 14 19 20 21 22 23 24 25 26 27 28 29 30 31 32

Carcharhinus altimus

Bignose shark

Carcharhinidae: Requiem sharks

CCA

Carcharhinus galapagensis

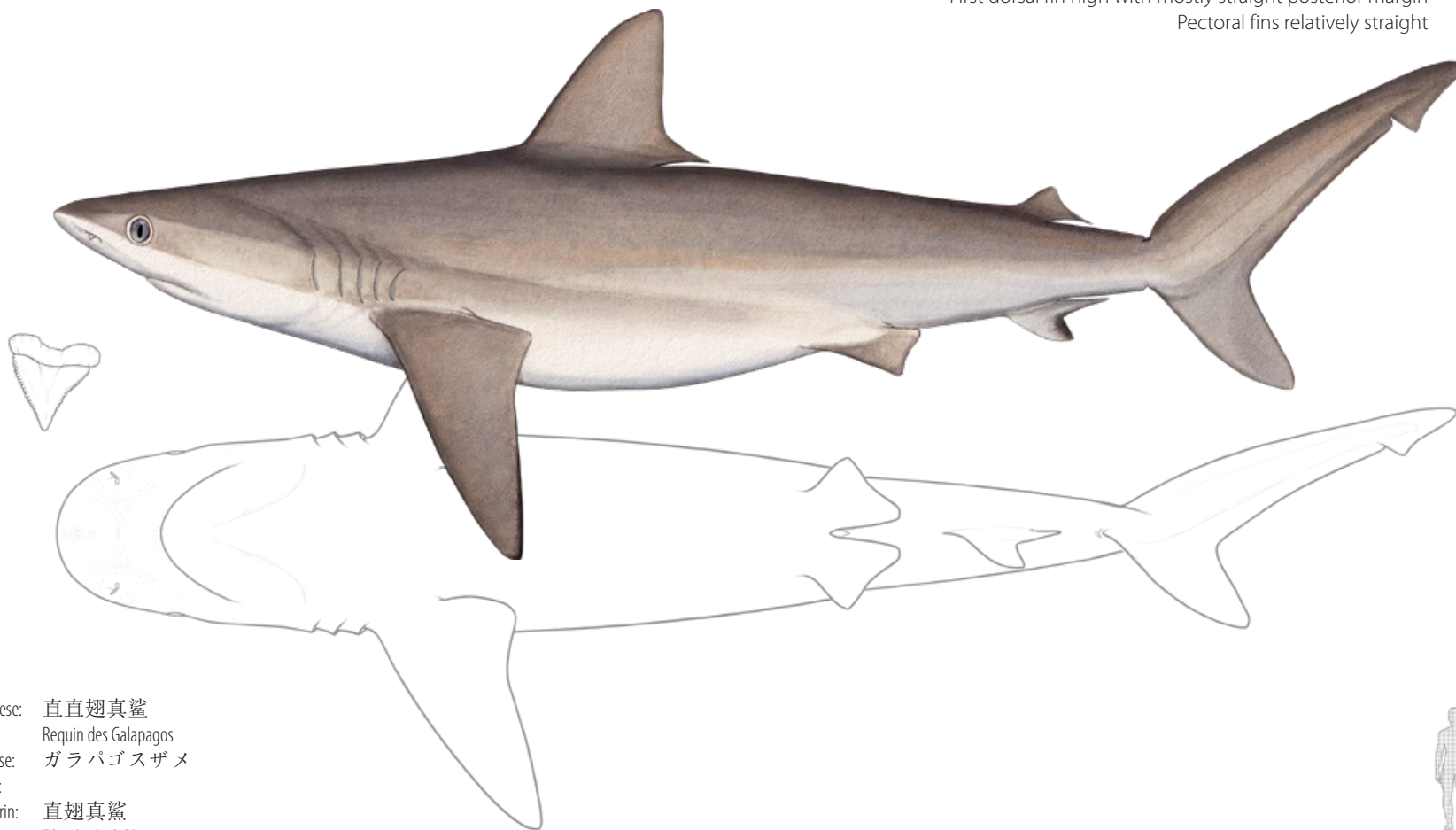
Galapagos shark

Carcharhinidae: Requiem sharks

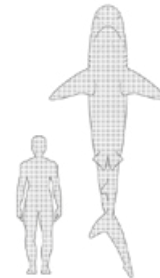
Identification keys 1 2 3 6 10 13 14 19 20 21 22 23 24 25 26 27 28 29 30 31 33

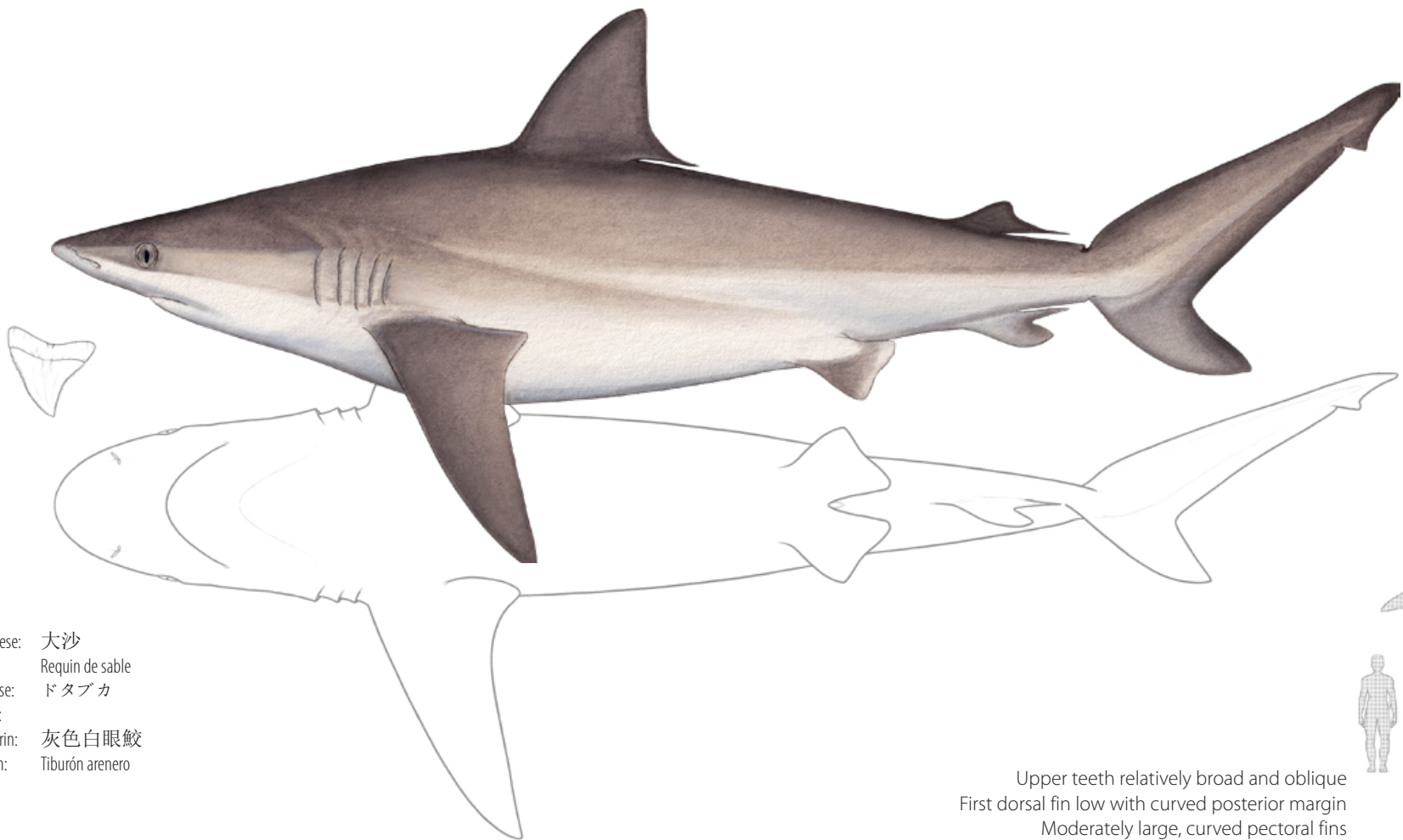
CCG

Upper teeth relatively narrow
First dorsal fin high with mostly straight posterior margin
Pectoral fins relatively straight



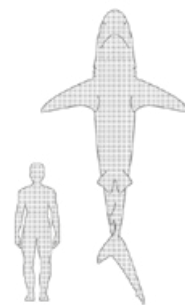
Cantonese: 直直翅真鯊
French: Requin des Galapagos
Japanese: ガラパゴスザメ
Korean:
Mandarin: 直翅真鯊
Spanish: Tiburón de Galápagos





Cantonese: 大沙
 French: Requin de sable
 Japanese: ドタブカ
 Korean:
 Mandarin: 灰色白眼鯊
 Spanish: Tiburón arenero

Upper teeth relatively broad and oblique
 First dorsal fin low with curved posterior margin
 Moderately large, curved pectoral fins



Identification keys 1 2 3 6 10 13 14 19 20 21 22 23 24 25 26 27 28 29 30 31 33

Carcharhinus obscurus

Dusky shark

Carcharhinidae: Requiem sharks

DUS

Carcharhinus leucas

Bull shark

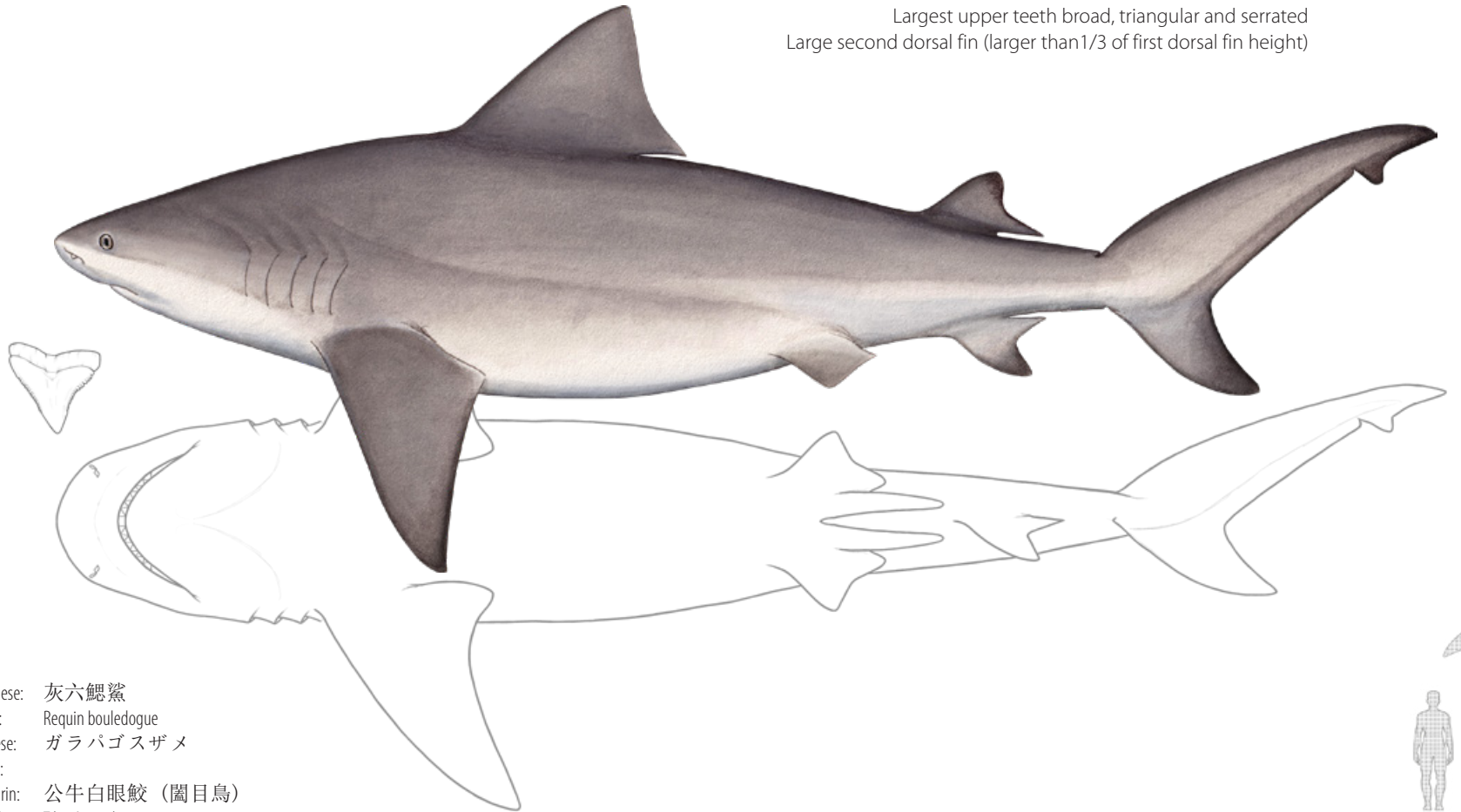
Carcharhinidae: Requiem sharks

CCE

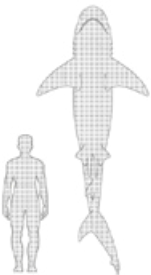
Identification keys 1 2 3 6 10 13 14 19 20 21 22 23 24 25 26 27 28 29 34

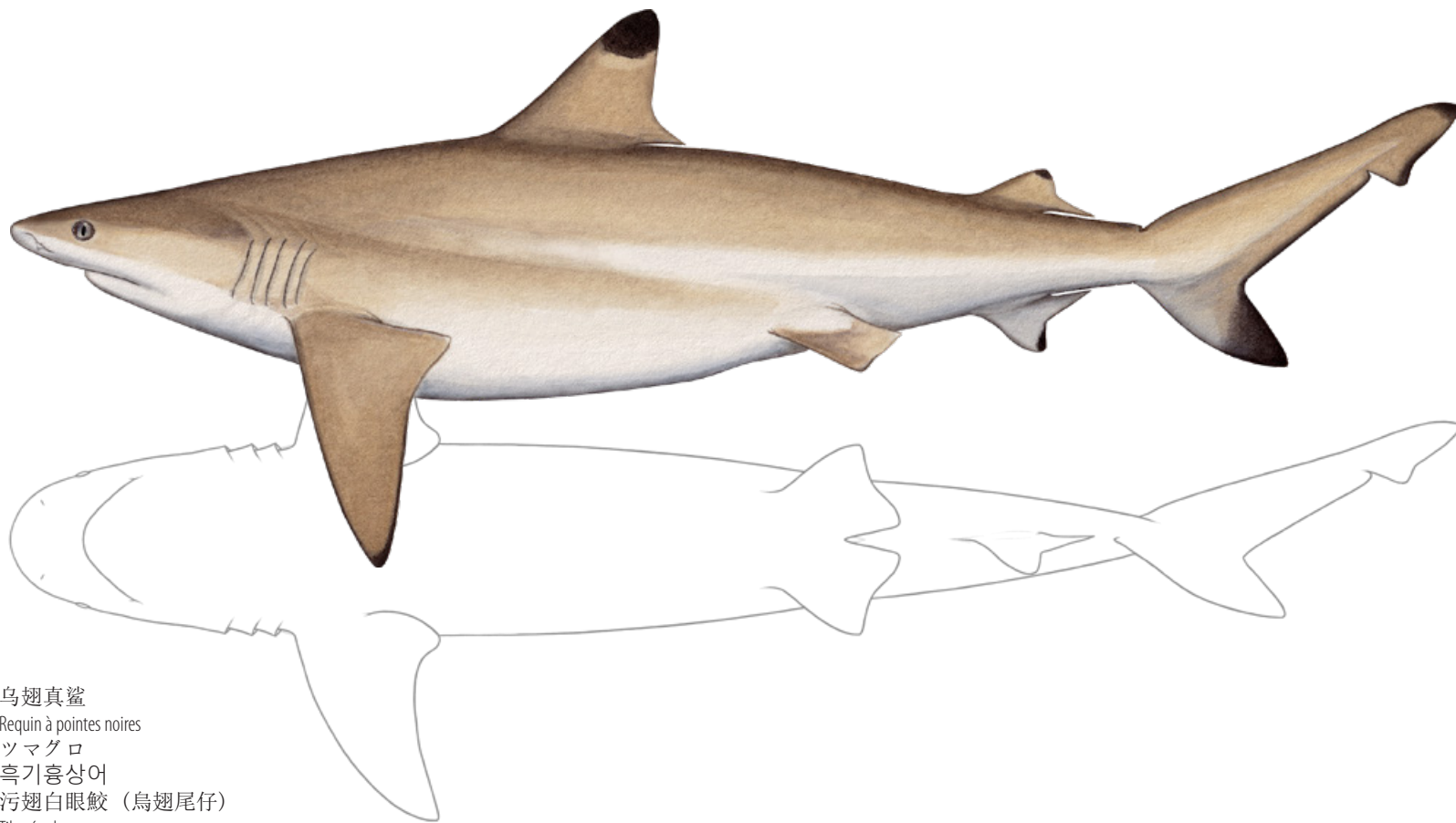
Body very stocky
Short blunt snout

Largest upper teeth broad, triangular and serrated
Large second dorsal fin (larger than 1/3 of first dorsal fin height)



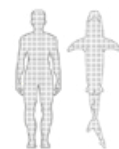
Cantonese: 灰六鰓鯊
French: Requin bouledogue
Japanese: ガラパゴスザメ
Korean:
Mandarin: 公牛白眼鯊 (鬪目島)
Spanish: Tiburón sarda





Cantonese: 乌翅真鲨
 French: Requin à pointes noires
 Japanese: ツマグロ
 Korean: 흑기흉상어
 Mandarin: 污翅白眼鲛 (烏翅尾仔)
 Spanish: Tiburón de puntas negras

Body yellow-brown to brown-grey with pale flank stripe
 First dorsal with distinct black tip highlighted by white
 Caudal fin with black tip on lower lobe that joins black posterior edge



Identification keys **1** **2** **3** **6** **10** **13** **14** **19** **20** **21** **22** **23** **24** **25** **26** **27** **28** **29** **34** **35**

Carcharhinus melanopterus

Blacktip reef shark

Carcharhinidae: Requiem sharks

BLR

Carcharhinus brevipinna

Spinner shark

Carcharhinidae: Requiem sharks

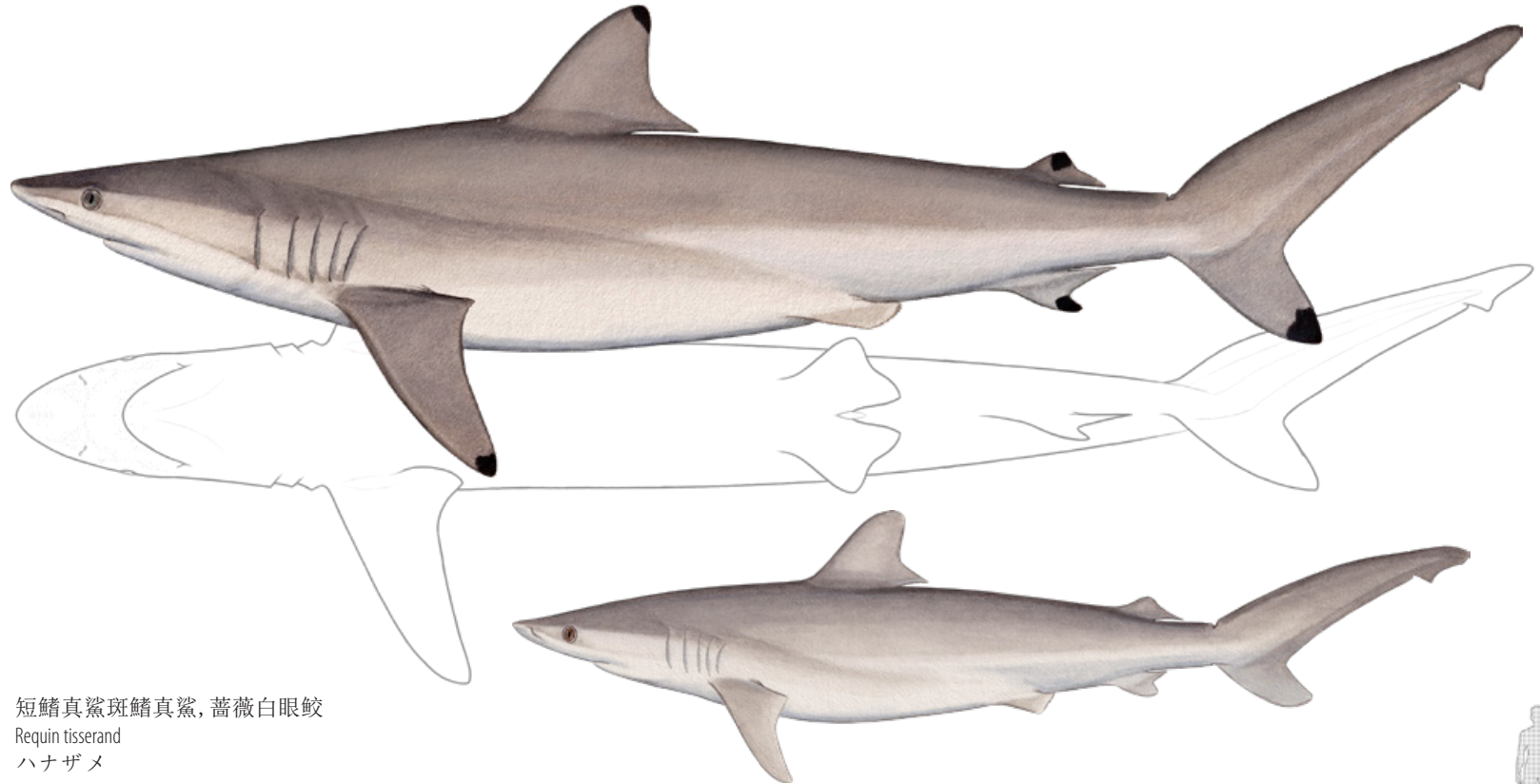
Identification keys 1 2 3 6 10 13 14 19 20 21 22 23 24 25 26 27 28 29 34 35 36

CCB

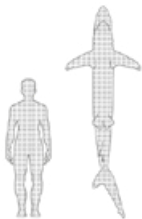
Slender body and long narrow pointed snout

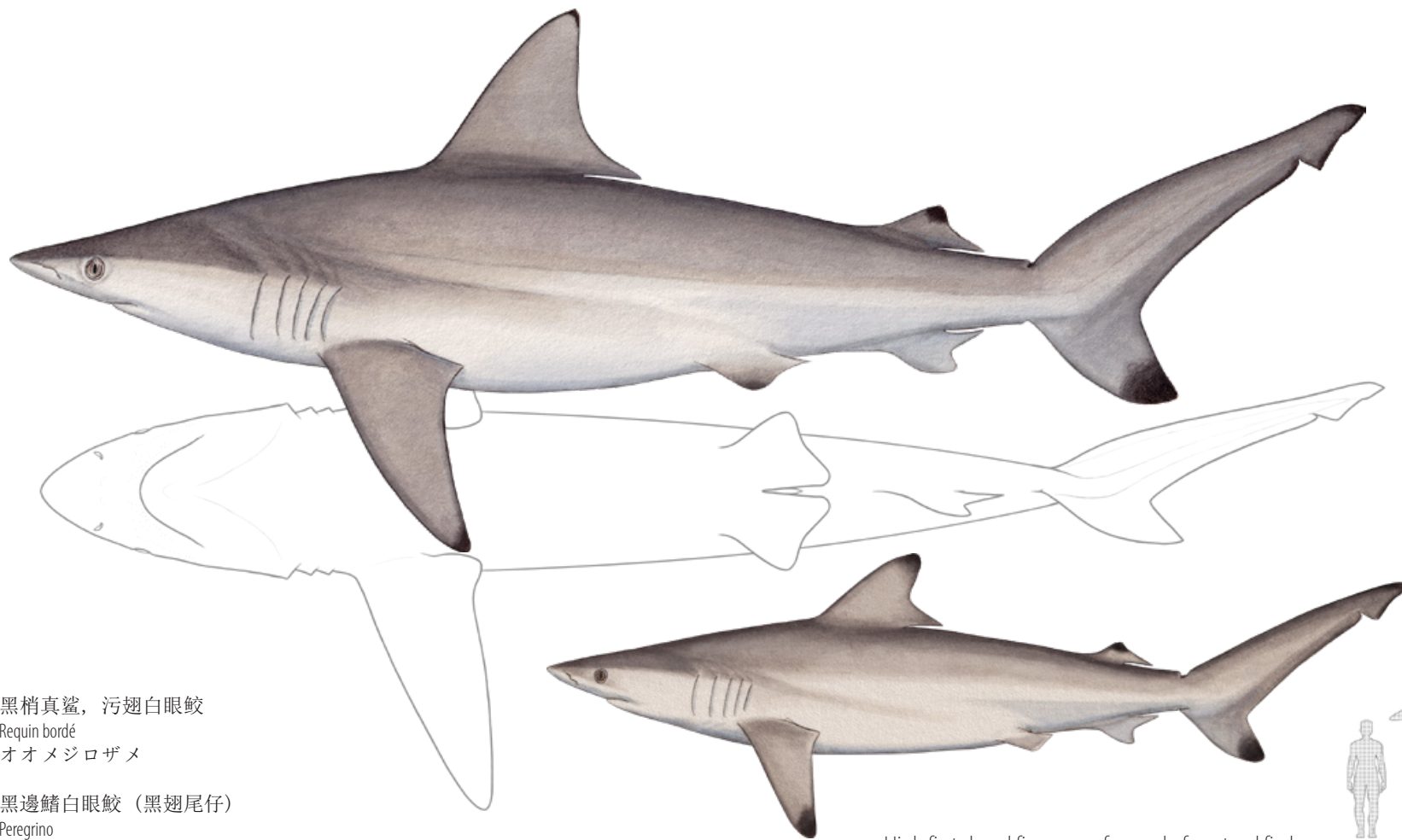
First dorsal fin relatively low, origin over or just behind pectoral free rear tips

Black tips on all fins except pelvic fins (NOT in juveniles)



Cantonese: 短鰭真鯊斑鰭真鯊, 薔薇白眼鯨
French: Requin tisserand
Japanese: ハナザメ
Korean:
Mandarin: 直齒真鯊
Spanish: Tiburón aleta negra





Cantonese: 黑梢真鲨, 污翅白眼鲛
 French: Requin bordé
 Japanese: オオメジロザメ
 Korean:
 Mandarin: 黑边鳍白眼鲛 (黑翅尾仔)
 Spanish: Peregrino

High first dorsal fin over or forward of pectoral fin base
 Black edges on first dorsal apex and dorsal caudal lobe
 Black tips to pectorals, dorsals, pelvics and ventral caudal lobe (ALSO in juveniles)

Identification keys **1** **2** **3** **6** **10** **13** **14** **19** **20** **21** **22** **23** **24** **25** **26** **27** **28** **29** **34** **35** **36**

Carcharhinus limbatus

Common blacktip shark

Carcharhinidae: Requiem sharks

CCL

Mobula birostris

Giant manta

Mobulidae: Devil rays

RMB

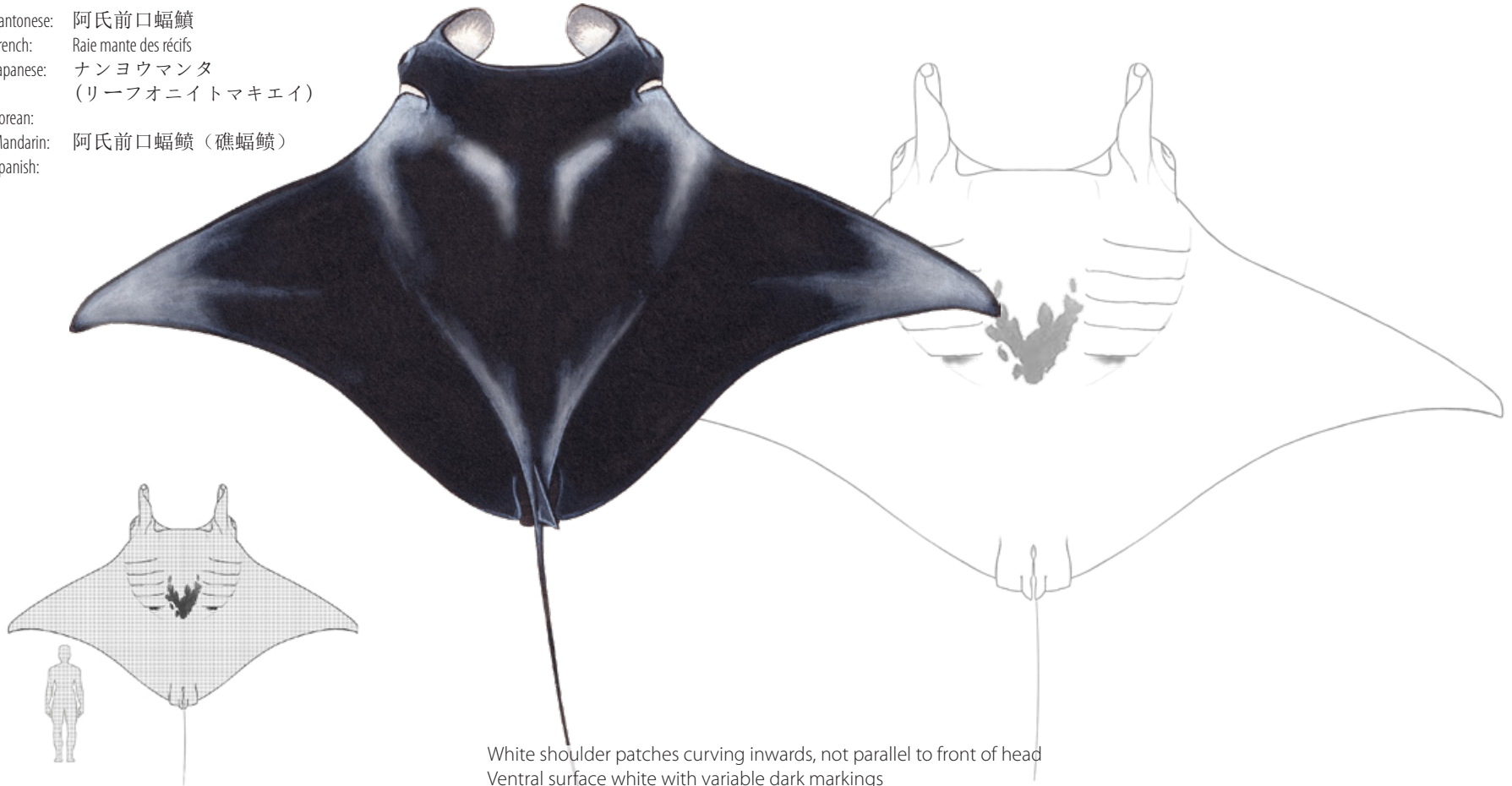
Identification keys **1** **37** **38** **39**

White shoulder patch anterior margins parallel to front of head
Calcified lump with embedded spine behind dorsal fin
Large black spot emanating from fifth gill slits

Cantonese: 双吻前口蝠鱝
French: Mante géante
Japanese: オニイトマキエイ
Korean:
Mandarin: 雙吻前口蝠鱝
(鬼蝠魟、飛魴仔)
Spanish: Manta gigante



Cantonese: 阿氏前口蝠鱝
 French: Raie mante des récifs
 Japanese: ナンヨウマンタ
 (リーフオニトマキエイ)
 Korean:
 Mandarin: 阿氏前口蝠鱝 (礁蝠鱝)
 Spanish:



White shoulder patches curving inwards, not parallel to front of head
 Ventral surface white with variable dark markings
 Small black spot emanating from fifth gill slits
 Large, very broad and terminal pale mouth

Identification keys **1** **37** **38** **39**

Mobula alfredi

Reef manta

Mobulidae: Devil rays

RMA

Mobula tarapacana

Chilean devilray

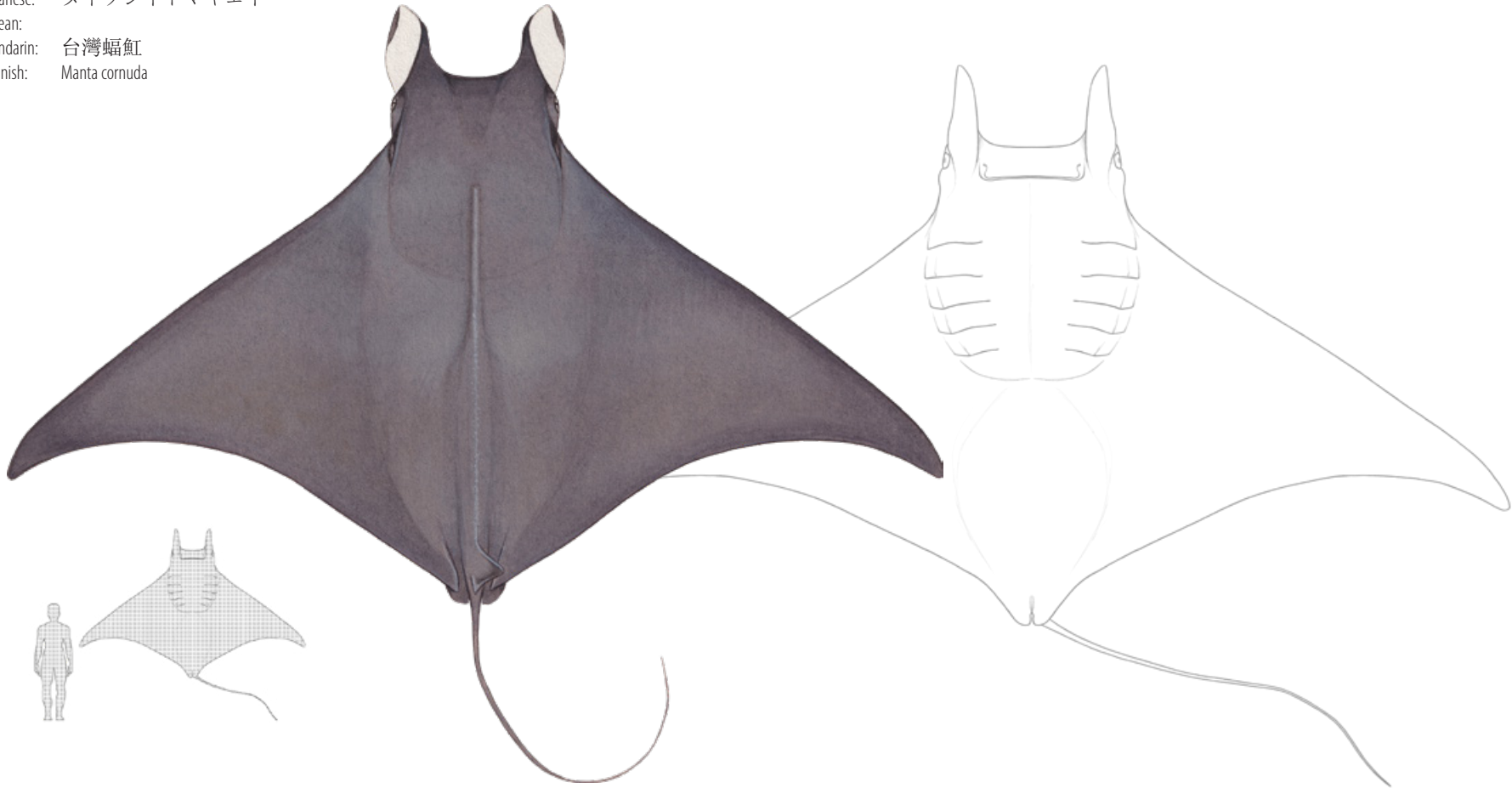
Mobulidae: Devil rays

RMT

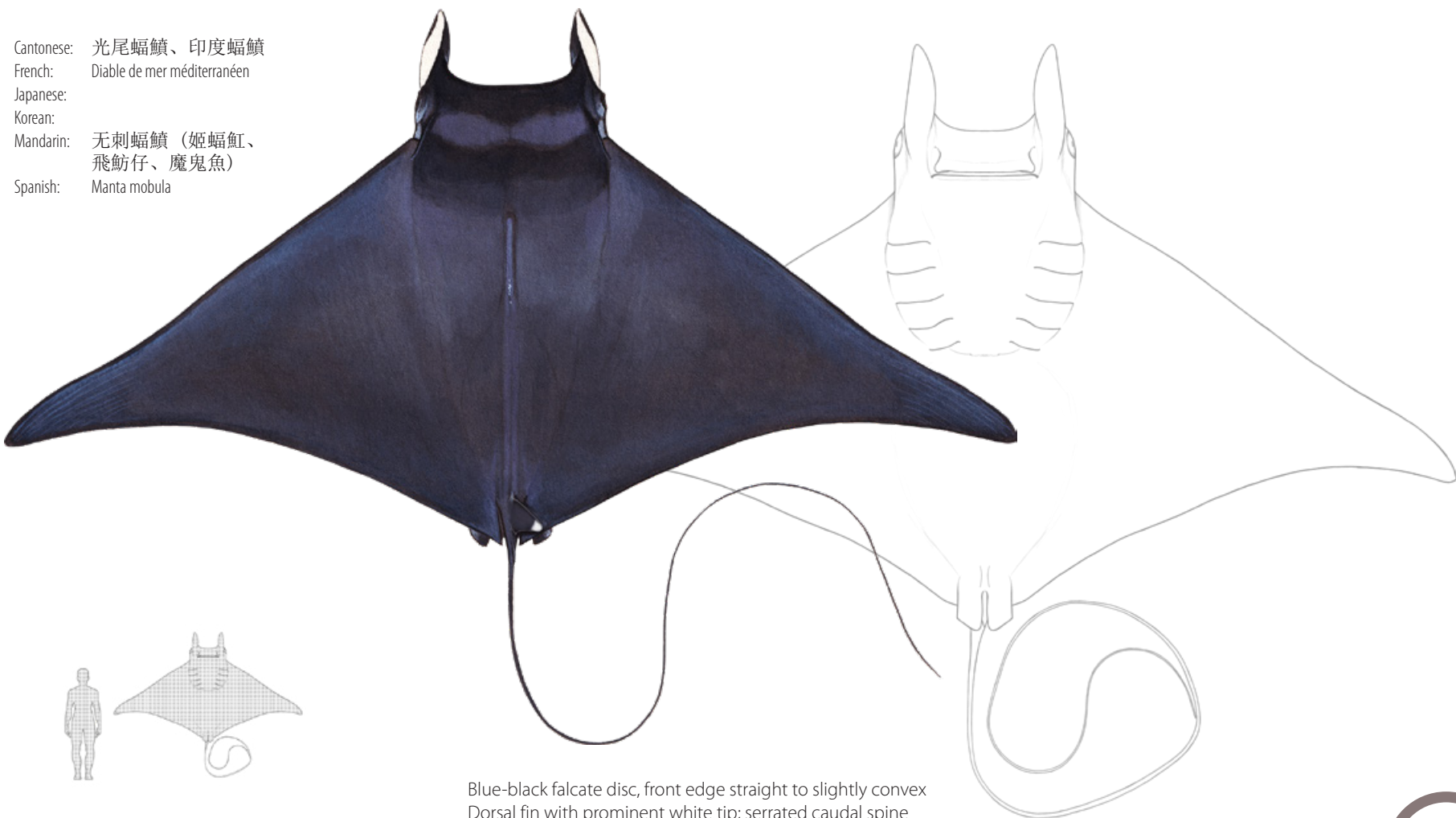
Identification keys **1** **37** **38** **39**

Cantonese: 台灣蝠魞
French: Mante chilienne
Japanese: タイワンイトマキエイ
Korean:
Mandarin: 台灣蝠魞
Spanish: Manta cornuda

Pectoral fins strongly falcate
Strong bony ridge along dorsal midline
Disc greyish, elongate and strongly falcate
Dorsal fin uniform grey; no caudal spine



Cantonese: 光尾蝠鱝、印度蝠鱝
 French: Diable de mer méditerranéen
 Japanese:
 Korean:
 Mandarin: 无刺蝠鱝 (姬蝠魟、
 飛魟仔、魔鬼魚)
 Spanish: Manta mobula



Blue-black falcate disc, front edge straight to slightly convex
 Dorsal fin with prominent white tip; serrated caudal spine

Identification keys **1** **37** **38** **39**

Mobula mobular

Giant devilray

Mobulidae: Devil rays



Mobula thurstoni

Bentfin devilray

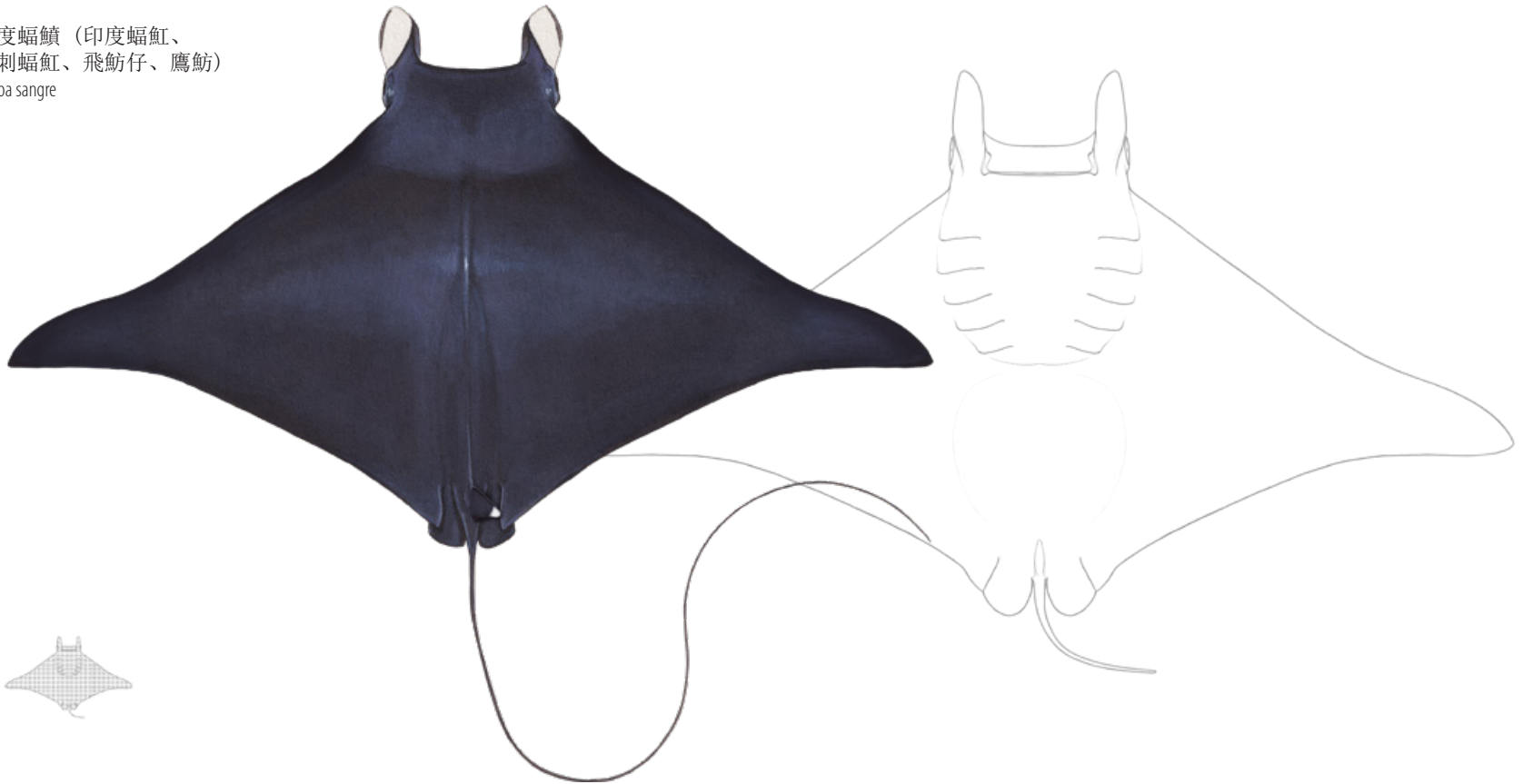
Mobulidae: Devil rays

RMO

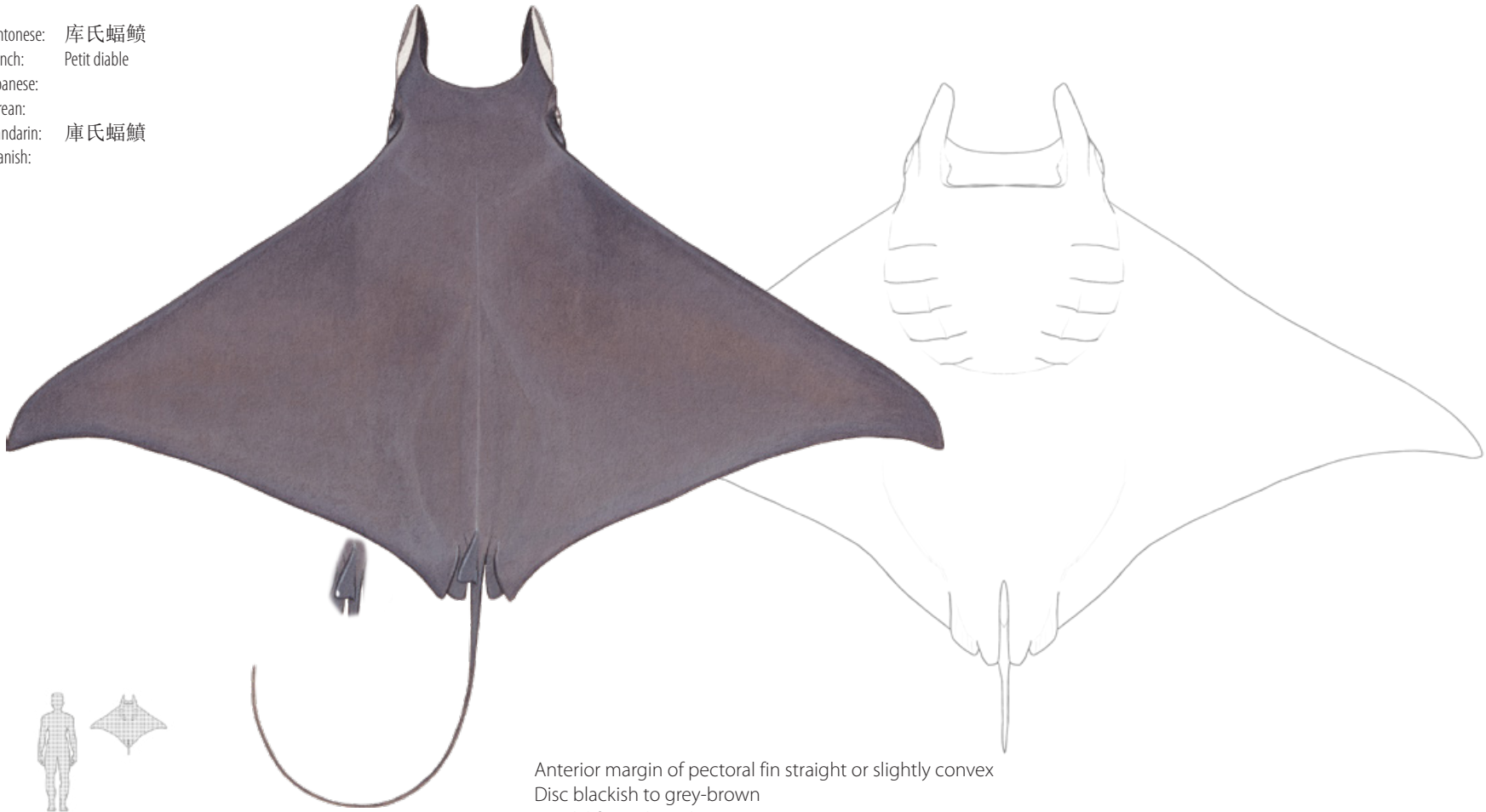
Identification keys **1** **37** **38** **40** **42**

Cantonese: 光尾蝠鱝、印度蝠鱝
French: Mante vampire
Japanese: ヒメイトマキエイ
Korean:
Mandarin: 印度蝠鱝 (印度蝠魞、
無刺蝠魞、飛魞仔、鷹魞)
Spanish: Chupa sangre

Anterior margin of pectoral fins with double curved edge
Dorsal fin with a prominent white tip, no caudal spine
Base of tail depressed



Cantonese: 库氏蝠鲞
French: Petit diable
Japanese:
Korean:
Mandarin: 庫氏蝠鯊
Spanish:



Anterior margin of pectoral fin straight or slightly convex
Disc blackish to grey-brown
Caudal fin with a white tip
Base of tail quadrangular

Identification keys **1** **37** **38** **40** **42**

Mobula kuhlii Shortfin devilray

Mobulidae: Devil rays



Rhinoptera javanica

Javan cownose ray

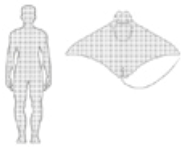
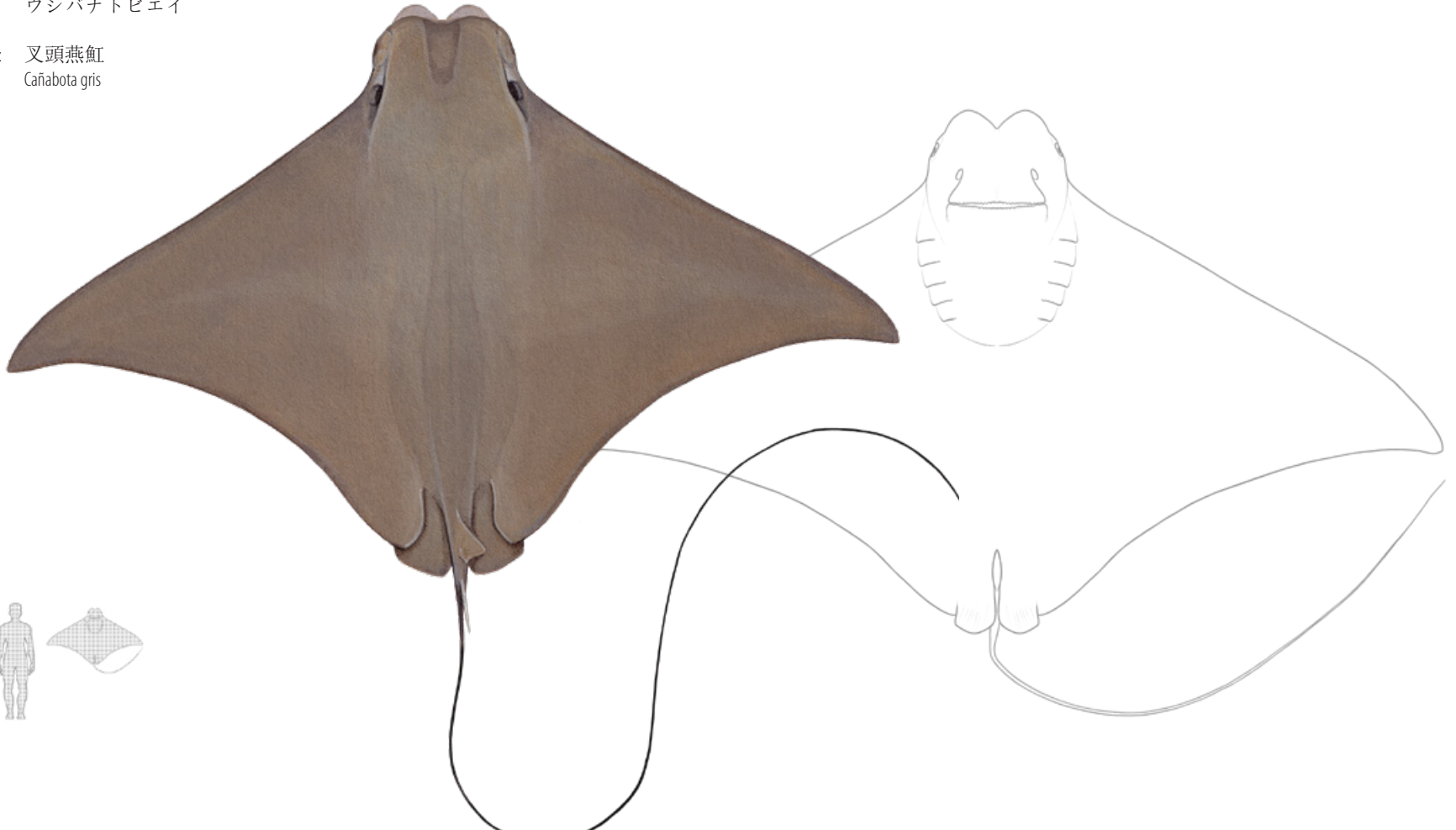
Rhinopterae: Cownose rays

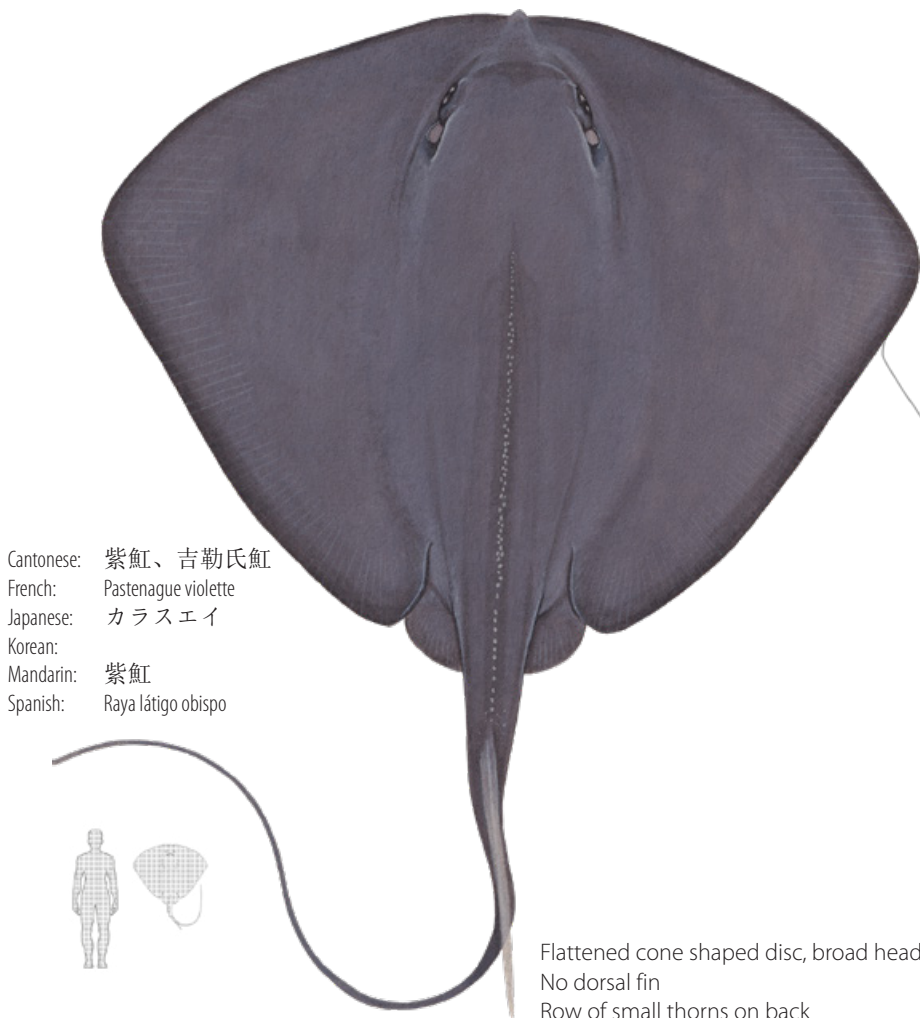
MRJ

Identification keys 1 37 43

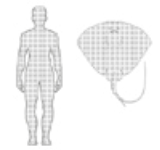
Snout with a pair of broad lobes separated by a deep notch
Spiracle larger than eye slightly behind pectoral fins' front edge
Dorsal fin origin well behind pectoral fin insertions

Cantonese: 爪哇牛鼻鱘
French: Mourine javanaise
Japanese: ウシバナトビエイ
Korean:
Mandarin: 叉頭燕魷
Spanish: Cañabota gris

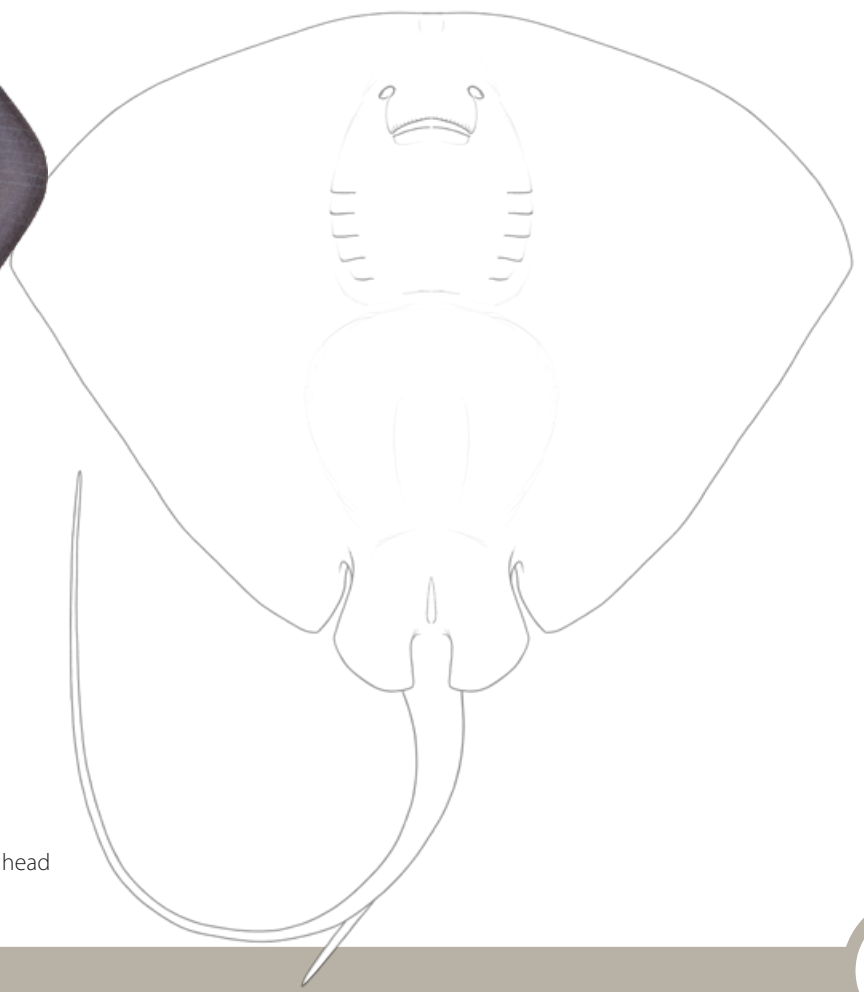




Cantonese: 紫魷、吉勒氏魷
 French: Pastenague violette
 Japanese: カラスエイ
 Korean:
 Mandarin: 紫魷
 Spanish: Raya látigo obispo



Flattened cone shaped disc, broad head
 No dorsal fin
 Row of small thorns on back



Identification keys 1 37 43

Pteroplatytrygon violacea

Pelagic stingray

Dasyatidae: Stingrays



WCPFC shark and ray handling guidelines for purse-seiner and longliner crew

The purpose of the shark and ray handling guidelines in this manual is to inform observers and crew of the WCPFC-recommended handling methods for the release of sharks and rays to minimise injury to sharks, rays and the crew.

The objective of the WCPFC-recommended shark and ray handling guidelines is to create routine processes to release sharks and rays safely and enhance their survival by mitigating the risk of injury and stress. The release of SSIs is compulsory. The guidelines should also be used for other key shark species to be released with minimal injury when they are not to be retained and fully utilised.

Vessel operators and crew are advised by WCPFC to adopt these guidelines as best handling practices for the release of sharks and rays. Maintaining crew safety is the top priority. Where large and dangerous animals are to be released, the guidelines recommend the use of tools such as stretchers to carry the sharks, or netting to lift them from the deck. Preferably they should be released directly from the net or line while still in the water. The crew should be prepared with the necessary equipment and instructed on how to use it to make the processes safe.

The role of the Pacific Islands Regional Fisheries Observers (PIRFOs) is to record the fate and condition of the released sharks and rays and note the method of release. PIRFOs also report what mitigation procedures are used to avoid SSI landings. It is not the role of an observer to release the sharks and rays.

These guidelines represent a compilation of WCPFC-recommended handling standards and illustrations. The source documents are listed in reverse chronological order on the next page of this section and should also be referred to for further detail.

Reference sources

Handling guidelines

- Anon., Australia. 2019. Information paper for a draft conservation and management measure on mobulid rays caught in association with fisheries in the WCPFC Convention area. WCPFC-TCC15-2019-DP05_rev
- Justel-Rubio A., Swimmer Y. and Hutchinson M. 2019. Graphics for best handling practices for the safe release of sharks. WCPFC-SC15-2019/EB-WP-14.
- Grande M. , Murua J., Ruiz J., Ferarios J.M., Murua H. , Krug I. , Arregui I., Zudaire I., Goñi N. and Santiago J. 2019. Bycatch mitigation actions on tropical tuna purse seiners: best practices program and bycatch releasing tools. In: IATTC - 9th Meeting of the Working Group on Bycatch. San Diego, California.
- WCPFC 15. 2018. Best handling practices for the safe release of sharks (other than whale sharks and mantas/mobulids). suppl_CMM 2010-07. WCPFC15 Summary Report.
- Common Oceans (ABNJ) Tuna Project. 2018. Safe release guidelines for sharks and rays 2018. WCPFC-SC14-2018/EB-IP-03.
- Clarke S., Staisch K. and Manarangi-Trott L. 2017. Clarification of WCPFC shark designations and observer data collection requirements in response to WCPFC13 decisions regarding manta and mobulid (devil) rays. WCPFC-SC13-2017/ST-WP-07.
- WCPFC. 2017. Best handling practices for the safe release of mantas and mobulids. suppl_CMM 2010-07. WCPFC14 ISG-5 Report. ,WCPFC SC13 Summary Report, Attachment P.
- WCPFC. 2015. Guidelines for the safe release of encircled whale sharks. suppl_CMM 2012-04, WCPFC 12 Summary Report,
- Gilman E. (Ed.). 2014. Methods for longline fishers to safely handle and release unwanted sharks and rays. Luen Thai Fishing Venture, Resources Legacy Fund, Secretariat of the Pacific Community, The Safina Center.
- Poisson F., Vernet A.L., Seret B. and Dagorn L. 2012. Good practices to reduce the mortality of sharks and rays caught incidentally by the tropical tuna purse seiners. WCPFC-SC8-2012/ EB-IP-12

WCPFC conservation and management measures pertaining to sharks and rays

- CMM 2014-05. (2014). Conservation and Management Measure For Sharks. WCPFC.
- CMM 2013-08. (2013). Conservation and Management Measure For Silky Sharks. WCPFC.
- CMM 2012-04 (2012). Conservation and Management Measure for Protection of Whale Sharks from Purse Seine Fishing Operations. WCPFC.
- CMM 2011-04 (2011). Conservation and Management Measure for Oceanic Whitetip Shark. WCPFC.
- CMM 2010-07, (2010). Conservation and Management Measure for Sharks II. WCPFC.



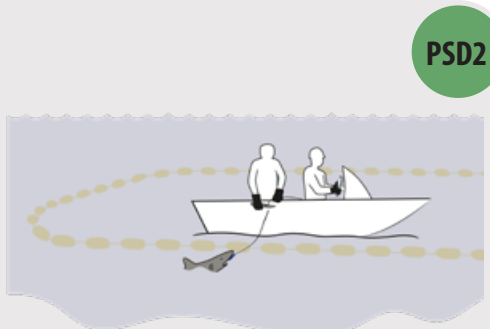
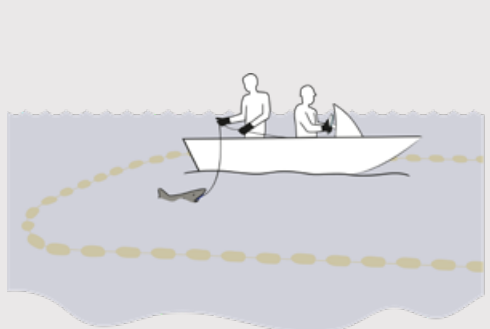
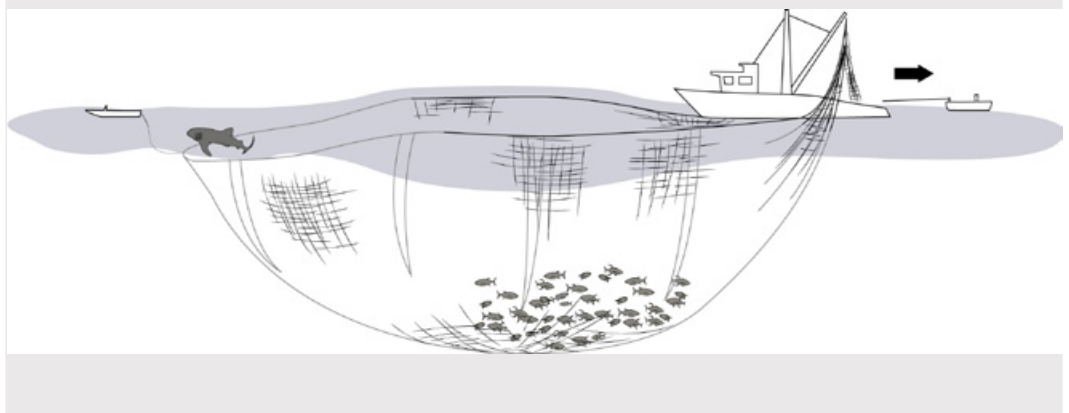
DOs and DON'Ts for purse-seiner crew



DOs and DON'Ts for longliner crew

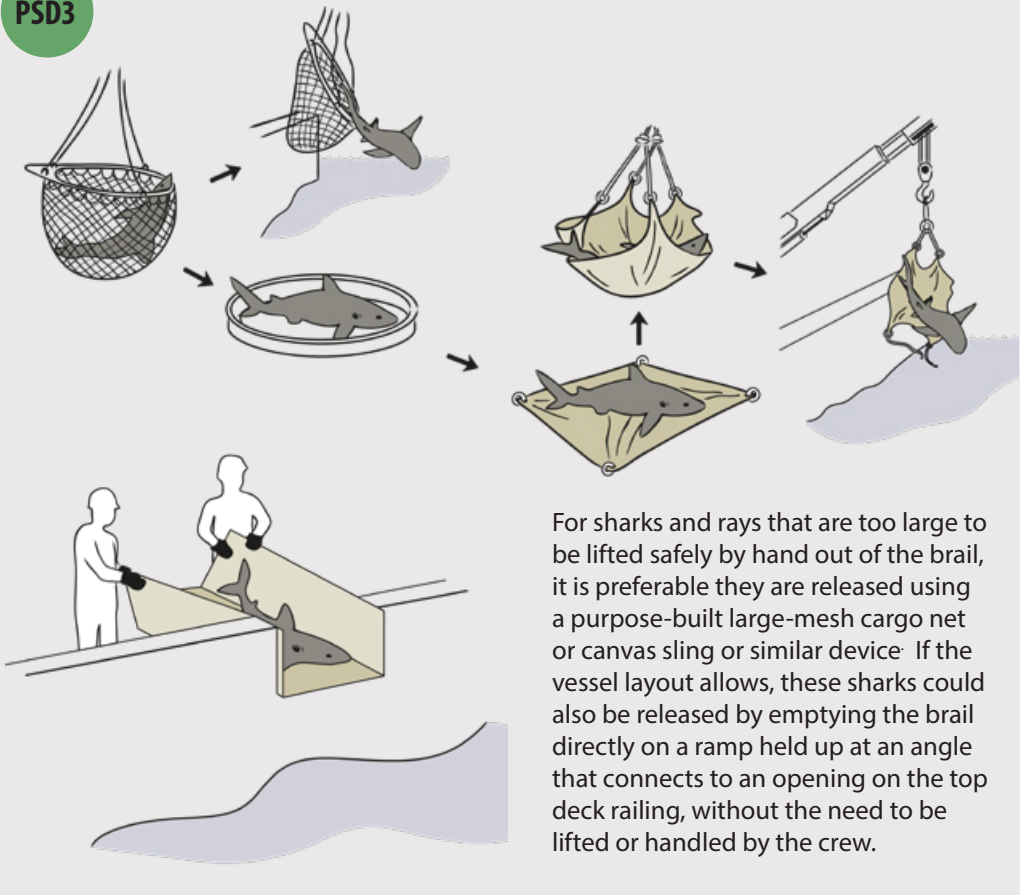
PURSE SEINERS

Release sharks and rays while they are still free-swimming whenever possible (e.g. back down procedure, submerging corks, cutting net)



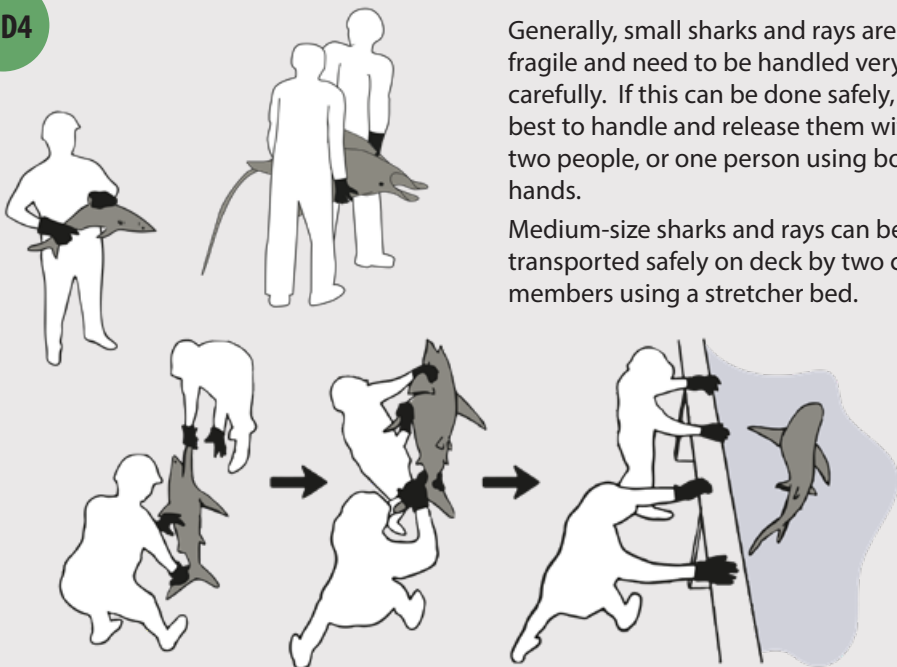
For sharks that cannot be released from the purse-seine net, consider removing them using a hook and line.

PSD3



For sharks and rays that are too large to be lifted safely by hand out of the brail, it is preferable they are released using a purpose-built large-mesh cargo net or canvas sling or similar device. If the vessel layout allows, these sharks could also be released by emptying the brail directly on a ramp held up at an angle that connects to an opening on the top deck railing, without the need to be lifted or handled by the crew.

PSD4

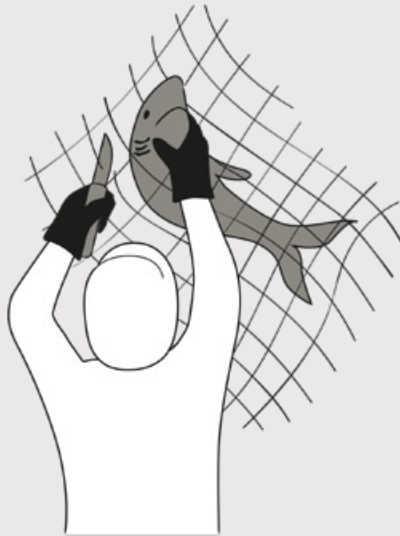


Generally, small sharks and rays are fragile and need to be handled very carefully. If this can be done safely, it is best to handle and release them with two people, or one person using both hands.

Medium-size sharks and rays can be transported safely on deck by two crew members using a stretcher bed.

Illustrations based on Poisson et al, 2012

PSD5



When entangled in netting, if safe to do so, carefully cut the net away from the animal and release it to the sea as quickly as possible with no netting attached.

PSN1



Do not wait until hauling is finished to release sharks and rays. Return them to the sea as soon as possible.

PSN2

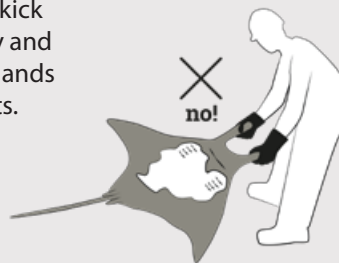


Do not cut or punch holes through the shark's or ray's body.

PSN3



Do not gaff or kick a shark or a ray and do not insert hands into the gill slits.

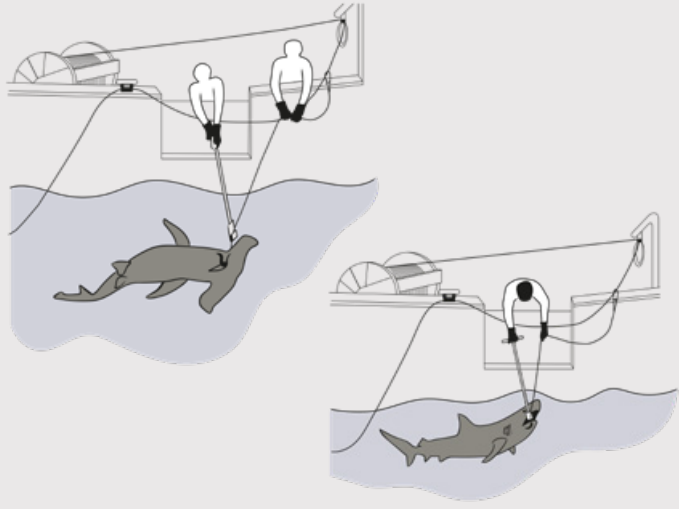


Do not pull a ray by the head lobes.

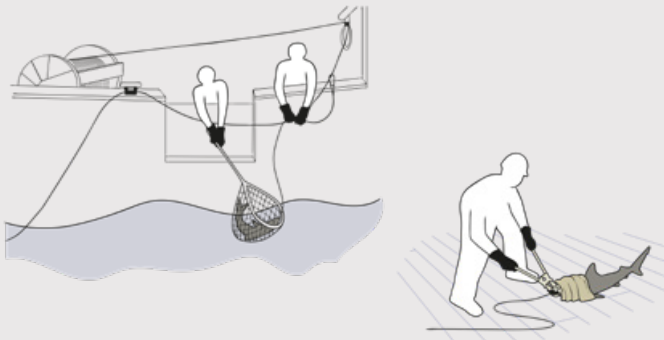
LONGLINERS

LLD1

The preference is to release all sharks and rays while they are still in the water, if possible. Use a dehooker to remove the hook or a long-handled line cutter to cut the gear as close to the hook as possible (ideally leaving less than 0.5 meters of line attached to the animal).



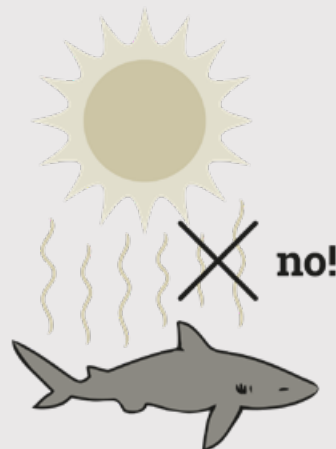
LLD2



If de-hooking in the water proves to be difficult, and the shark or ray is small enough to be accommodated in a dip net, bring it on board and remove as much gear as possible by using a dehooker. If hooks are embedded, either cut the hook with bolt cutters or cut the line at the hook and gently return the animal to the sea.

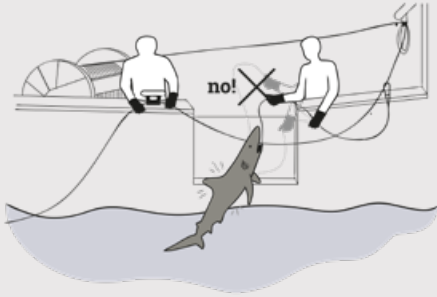
LLD3

Release all sharks and rays brought on deck as quickly as possible.



Do not strike a shark or a ray against any surface to remove the animal from the line.

LLN1



Do not try to remove a hook by pulling sharply on the branchline.

LLN3



Do not attempt to dislodge a hook that is deeply ingested and not visible.

LLN2

Do not cut the tail or any other body part.

LLN4



Do not gaff or kick a shark or a ray and do not insert hands into the gill slits.

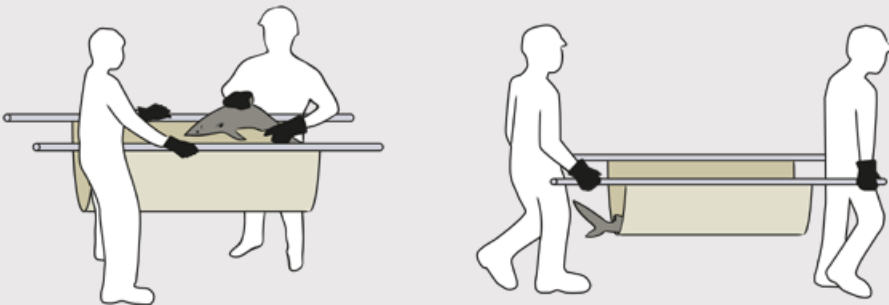
LLN5

ADDITIONAL RECOMMENDATIONS

Knowing that any fishing operation may catch sharks or rays, several tools can be prepared in advance (e.g. canvas, net slings or stretchers for carrying or lifting; large mesh net or grid to cover hatches/hoppers on purse seiners; long-handled cutters and dehookers on longliners).

Example of stretcher use

AR1



Install grid to cover hatches/hoppers

AR2

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BSK	Basking shark	p. 37	PTH	Pelagic thresher	p. 34
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CCE	Bull shark	p. 58	RMK	Giant devilray	p. 65
CCG	Galapagos shark	p. 56	RMM	Shortfin devilray	p. 67
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GLOSSARY

anterior	nearer the front of the body, or nearer to the head or forepart; opposite of posterior
apex	the uppermost point
bycatch	fish or other marine species caught unintentionally
concave	having an outline curved like the interior of a circle or sphere; opposite of convex
conspicuous	clearly visible; opposite of inconspicuous
convex	having an outline curved like the exterior of a circle or sphere; opposite of concave
denticle	a small, tooth-like structure on the skin of sharks and rays; placoid scale of cartilaginous fish.
dichotomous	divided into two mutually exclusive or contradictory groups or entities
disc	(of rays) dorsal or ventral body surface, excluding head and tail
dorsal	the upper side or back of the body; opposite of ventral
falcate	curved like a sickle; hooked
flank	the side of the body between the ribs and the hip
heterocercal	(of the caudal fin) having unequal upper and lower lobes, with the vertebral column passing into the upper lobe
homocercal	(of the caudal fin) having more or less equal upper and lower lobes, with the vertebral column passing into the upper lobe
inconspicuous	not prominent or readily noticeable; opposite of conspicuous
interdorsal ridge	a ridge of skin between the first and second dorsal fins
lateral	situated on one side or other of the body, especially in the region furthest from the median plane
lunate	(of the caudal fin) having more or less equal upper and lower lobes, with the vertebral column passing into the upper lobe (synonyms: homocercal, crescent shaped)
mottled	marked with spots or smears of colour
posterior	further back in position; of or nearer the rear or hind end; opposite of anterior
protrusible	capable of being thrust forward, as the tongue
serrated	having or denoting a jagged edge; sawlike
snout	part of a shark or ray in front of the mouth and eyes, including the nostrils
spiracle	external respiratory opening
subterminal	positioned near but not at the end of something
terminal	at the end of something
ventral	the underside of the body; opposite of dorsal



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