

## 4. ORDER CARNIVORA - Pinnipeds and other Marine Carnivores

### CARNIVORA

#### 4.1 SUBORDER PINNIPEDIA - Seals, Sea lions, and Walrus

### PINNIPEDIA

There are 34 species of pinnipeds (Suborder Pinnipedia), all of which are assigned to 3 families of the mammalian order Carnivora: the Otariidae, Phocidae and Odobenidae. The otariids are the 14 species of sea lions and fur seals, sometimes referred to as the eared or walking seals. The phocids are the 19 species of true seals, sometimes referred to as the earless true, or crawling seals. Odobenids are reduced to just a single living species, the walrus. There is controversy as to whether the pinnipeds are monophyletic (i.e., evolved from a single ancestor) or biphyletic (from 2 separate ancestors).

Pinnipeds are highly specialized aquatic carnivores that live in a diversity of marine habitats, and some freshwater ones as well. One unifying feature of the group is that all must return to a solid substrate, such as land or ice, to bear their pups. Females give birth to a single offspring per reproductive effort. Twins are extremely rare in all species. All species are amphibious, though the otariids are the most agile and mobile on land. In general, phocids are more capable divers and breath-holders, although there is overlap in the capabilities of some otariids and phocids. Some species spend considerable amount of time in the water, only coming ashore to breed or give birth.

Pinnipeds all have fur (but also use blubber for thermoregulation), 2 sets of limbs (called foreflippers and hindflippers), long whiskers, nasal openings at the tip of the snout, and reduced or lost ear flaps. Pinnipeds moult every year, some gradually over several weeks or months, others dramatically in a short time. In most species pups are born in a lanugo coat which differ from juvenile or adult pelage in colour and length. In the species accounts below, pinniped coloration is described in more detail than for cetaceans, because for identification, there is often more of an emphasis on the subtle shading often visible on hauled-out pinnipeds.

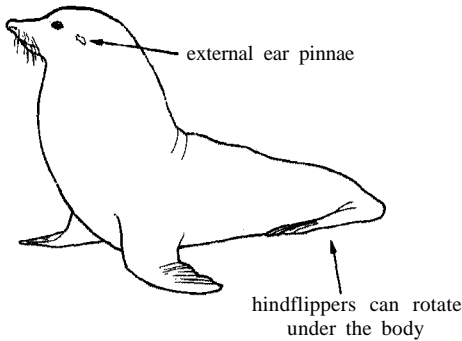
#### 4.1 .1 Key to Identification of Pinnipeds of the World

- 1a. Tail attached to body by web of skin; muzzle very short and broad with a flat end; nearly all vibrissae on the end (as opposed to the sides) of the muzzle; 2 massive upper canine teeth enlarged to form tusks that project up to 1 m out of the mouth (except in infants, or when broken off or worn in adults); only 3 post-canine teeth in each tooth row (Fig. 418) . . . . . **Walrus (*Odobenus rosmarus*) p. 256**
- 1b. Short free tail; muzzle generally tapering and somewhat pointed; nearly all vibrissae on the sides of the muzzle; upper canines never enlarged to form tusks that project out of the mouth; 5 to 6 post-canines in each row. . . . . → 2

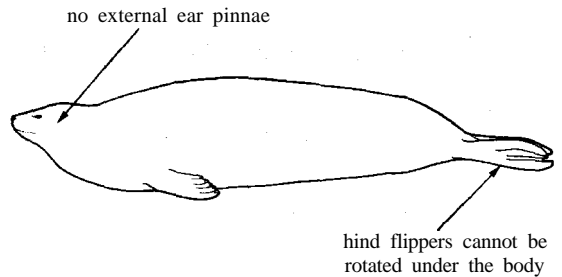


Fig. 418 *Odobenus rosmarus*

- 2a. External ear pinnae present: all flippers incompletely furred, with only a sparse growth of short hair on top; claws on foreflippers vestigial or absent; 3 claws on each hindflipper on the 3 central digits; long terminal flaps beyond the claws on the digits of the hindflippers; hindflippers can rotate under the body (permitting walking); skin light in colour; first 2 upper incisors with transverse grooves (Fig. 419) . . . . . **(Fur seal or sea lion) → 3**
- 2b. No external ear pinnae; all flippers completely furred on top and bottom; 5 usually prominent (except in *Hydrurga* and *Ommatophoca*, in which they are small) claws, 1 on each digit of both foreflippers; hindflippers cannot be rotated under the body (thus cannot walk on land); 5 or no claws visible near the end of each digit on the hindflippers; no long flaps of skin beyond claws on hindflipper digits: skin dark in colour; upper incisors not grooved transversely (Fig. 420) . . . . . **(True seal) → 16**

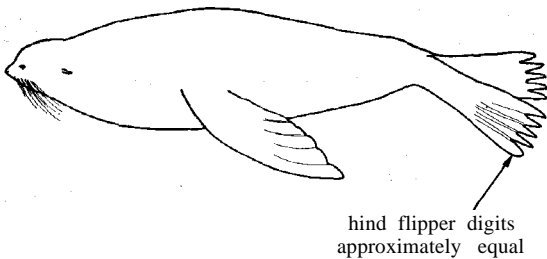


**Fig. 419 Eared seal**

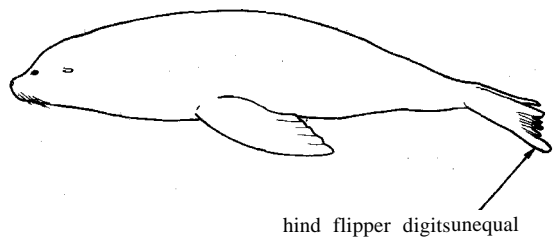


**Fig. 420 True seal**

- 3a. Dense underfur present: guard hairs (outer visible fur) long, giving a thick woolly appearance; terminal flaps on hindflipper digits all approximately equal in length and shape; relatively long prominent ear pinnae (Fig. 421) . . . . . **(Fur seal) → 4**
- 3b. Fur short and stiff, except for the mane of males of some species; hindflipper digits unequal in length, with the hallux and the 5th digit longer (the hallux is longer and wider) than digits 2 to 4; ear pinnae relatively short and lying close alongside head (Fig. 422) . . . . . **(Sea lion) → 12**



**Fig. 421 Fur seal**



**Fig. 422 Sea lion**

4a. Fur on the foreflippers stops abruptly at the wrist, with the top of the foreflippers entirely naked; hindflippers long, about one-fourth standard length; very long terminal flaps beyond the claws on the hindflippers; muzzle very short; distribution limited to North Pacific and adjacent seas (Fig. 423) . . . . . **Northern fur seal (*Callorhinus ursinus*)** p. 238

4b. Fur on top of hindflippers beyond the wrist (bend point when the animal is sitting upright): hindflippers about one-fifth of standard length; terminal flaps beyond the claws on the hindflippers moderate in length; muzzle relatively long; distribution limited to Southern Hemisphere and warm temperate eastern North Pacific (The "southern fur seals" [genus *Arctocephalus*] are all very similar in appearance, and only a few species have unique features that permit identification based on external characteristics. Also, some species [i.e. *A. gazella* and *A. tropicalis*] are known to hybridize. Adult females and sub-adult "southern fur seals" may not be separable based on external appearance. Skulls may be required to positively identify some species and separate them from related forms.) (Fig. 424) . . . . . **("Southern fur seal")** → 5

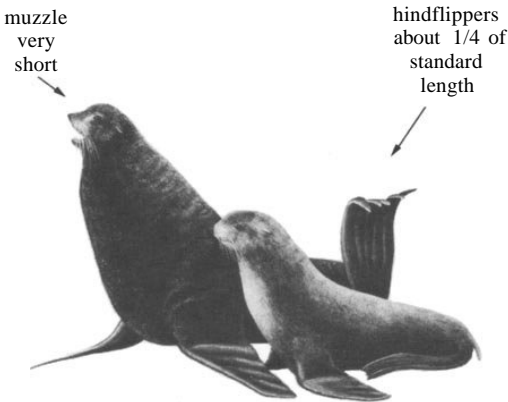


Fig. 423 *Callorhinus ursinus*

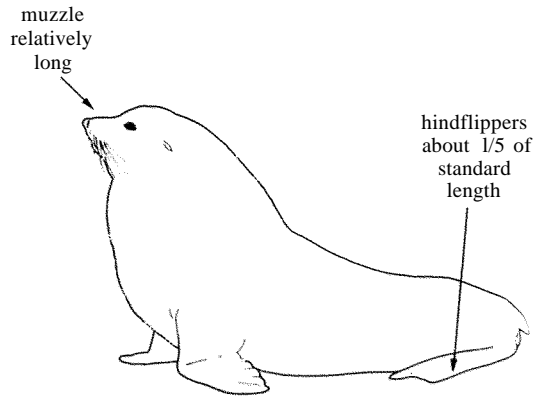


Fig. 424 "Southern fur seals"

5a. Muzzle short, with somewhat flattened end creating a pug appearance (Fig. 425). . . . . → 6

5b. Muzzle moderate to long (may not be possible to distinguish from 5a for females and subadults) (Fig. 426) . . . . . → 8

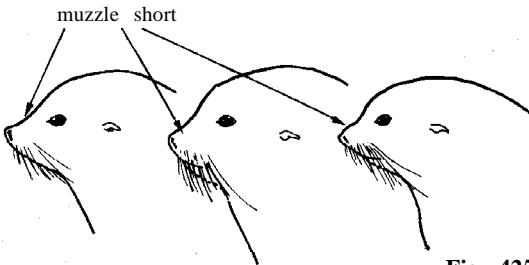


Fig. 425

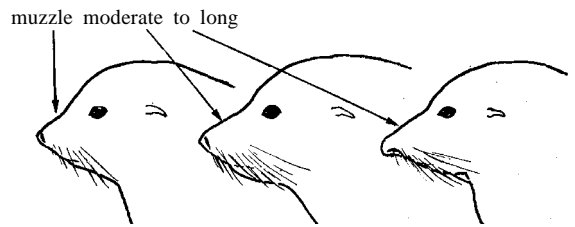


Fig. 426

- 6a. Adults with yellowish to orangish upper chest, neck, and face (to over the eyes); prominent crest of longer guard hairs on crown just behind the eyes (Fig. 427) . . . . . **Subantarctic fur seal (*Arctocephalus tropicalis*)** p. 250
- 6b. Adults with moderate to no contrast in coloration on upper chest, neck, and face . . . . . → 7



Fig. 427 *Arctocephalus tropicalis*

- 7a. Adults medium-sized; silver grey with frosted guard hair tips; distribution antarctic and subantarctic only (Fig. 428).. . . . . **Antarctic fur seal (*Arctocephalus gazella*)** p. 252
- 7b. Adults very small; generally minimal frosting on tips of guard hairs (if present usually not silver-grey); distribution confined to Galapagos Archipelago (Fig. 429) . . . . . **Galapagos fur seal (*Arctocephalus galapagoensis*)** p. 244



Fig. 428 *Arctocephalus gazella*



Fig. 429 *Arctocephalus galapagoensis*

- 8a. Large bulbous nose; downward-facing nostrils (adult males) (Fig. 430) . . . . . → 9
- 8b. Small to moderate nose (specifically the end of the muzzle, and not overall muzzle length); nostrils facing ahead (Fig. 431) . . . . . → 10

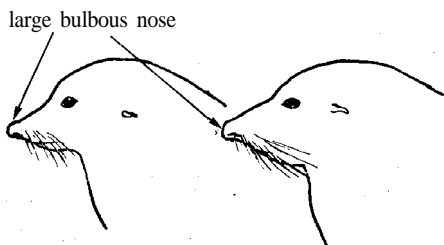


Fig. 430

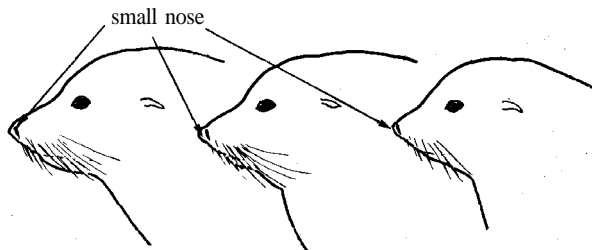


Fig. 431

- 9a. Distribution confined to area around Juan Fernandez Archipelago, off the coast of Chile (Fig. 432) . . . . . **Juan Fernandez fur seal (*Arctocephalus philippii*)** p. 242
- 9b. Distribution confined to eastern North Pacific, from about Guadalupe Island north to central California (Fig. 433) . . . . . **Guadalupe fur seal (*Arctocephalus townsendi*)** p. 240



**Fig. 432 *Arctocephalus philippii***



**Fig. 433 *Arctocephalus townsendi***

- 10a. Distribution confined to coastal South America, from Peru, south to Cape Horn, and north to Brazil and the Falkland Islands (Fig. 434) . . . . . **South American fur seal (*Arctocephalus australis*)** p. 246
- 10b. Distribution limited to either New Zealand, southern Australia and adjacent subantarctic islands and waters, or South Africa . . . . . → 11



**Fig. 434 *Arctocephalus australis***

- 11a. Very large, robust build; head massive; distribution limited to southwestern and southern Africa and southeastern Australia, including Tasmania (Fig. 435) . . . . . **South African or Australian fur seal (*Arctocephalus pusillus*)** p. 254
- 11b. Medium size; moderate build and head size; distribution limited to New Zealand and adjacent subantarctic islands, and southwestern Australia (Fig. 436) . . . . . **New Zealand fur seal (*Arctocephalus forsteri*)** p. 248



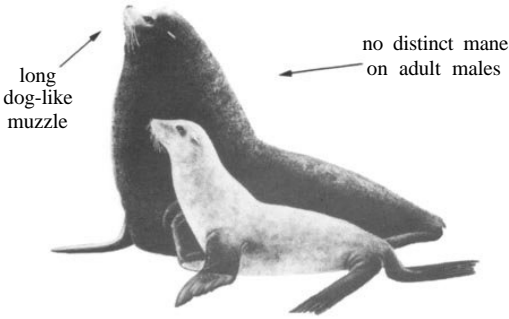
**Fig. 435 *Arctocephalus pusillus***



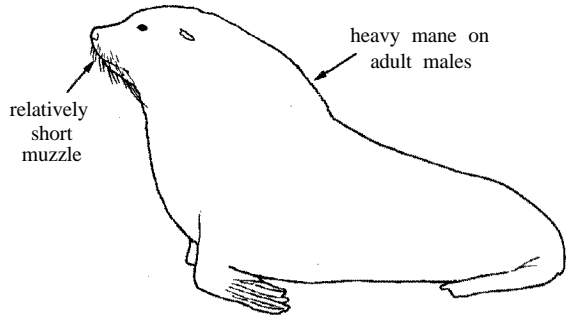
**Fig. 436 *Arctocephalus forsteri***

**12a.** No distinct mane on adult males; head of moderate size, with relatively long dog-like muzzle; bulging sagittal crest on adult male; distribution limited to the temperate easterh North Pacific or area around the Galapagos Islands and adjacent waters (Fig. 437) . . .  
 . . . . . **California or Galapagos sea lion (*Zalophus californianus*)** p. 230

**12b.** Heavy mane on adult males; head massive with blunt broad muzzle that is usually relatively short (the latter not so for adult male Australian sea lion) (Fig. 438) . . . . . → 13



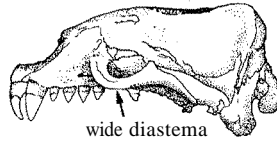
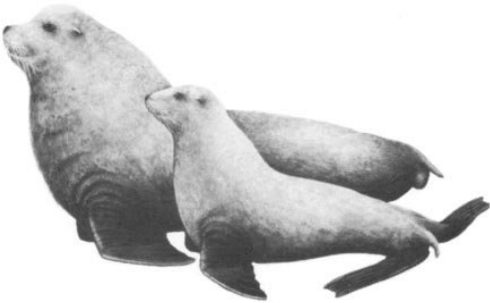
**Fig. 437 *Zalophus californianus***



**Fig. 438**

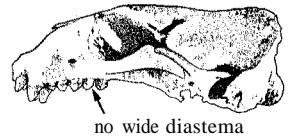
**13a.** Both sexes massive in size; wide diastema (gap) between 4th and 5th post-canine teeth; distribution limited to temperate and subpolar rim of North Pacific (Fig. 439) . . . . .  
 . . . . . **Steller sea lion (*Eumetopias jubatus*)** p. 228

**13b.** Both sexes moderate in size; no wide diastema between 4th and 5th post-canines; distribution limited to Southern Hemisphere (Fig. 440) . . . . . → 14



LATERAL VIEW OF SKULL

**Fig. 439 *Eumetopias jubatus***

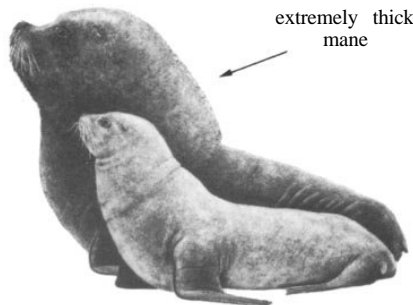


LATERAL VIEW OF SKULL

**Fig. 440**

**14a.** Extremely heavy (thick) mane of very long guard hairs; very short broad muzzle; massive (deep and wide) lower jaw; distribution along coastal South America, from Peru on the west coast, south to Cape Horn, and north to Brazil on the east coast, including the Falkland Islands (Fig. 441) . . . . . **South American sea lion (*Otaria byronia*)** p. 232

**14b.** Moderate mane of medium-length guard hairs; muzzle blunt, but moderate in length; distribution limited to New Zealand and adjacent subantarctic islands, or southern to southwestern Australia . . . . . → 15



**Fig. 441 *Otaria byronia***

- 15a. Adult males with mane extending up onto the top of the head and relatively flat topped muzzle: generally brownish, with yellowish back of neck and crown; females often strikingly bicoloured, dark above, pale below, with pale colour on the face and over the eyes; distribution limited to southern and southwestern Australia in coastal waters (Fig. 442) . . . . . **Australian sea lion (*Neophoca cinerea*) p. 234**
- 15b. Adult males with mane that stops at nape (head seems disproportionately small because of this); muzzle usually slightly convex in silhouette; colour blackish brown: distribution limited to southern New Zealand and adjacent subantarctic islands (Fig. 443). . . . .  
 . . . . . **New Zealand sea lion (*Phocartos hookeri*) p. 236**

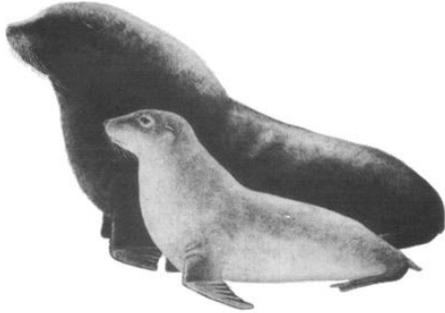


Fig. 442 *Neophoca cinerea*



Fig. 443 *Phocartos hookeri*

- 16a. Vibrissae smooth in outline; pelage generally without conspicuous spots, rings, blotches, bands, or streaks . . . . . → 17
- 16b. Vibrissae beaded (sometimes only weakly) in outline; pelage generally with conspicuous spots, rings, blotches, bands, or streaks . . . . . → 22
- 17a. Foreflippers square to rounded, with equal length digits, or digits 2 to 4 slightly longer; vibrissae very densely packed, so as to obscure mouthline (Fig. 444) . . . . .  
 . . . . . **Bearded seal (*Erignathus barbatus*) p. 274**
- 17b. Foreflippers pointed, with first digit longer and digits 2 to 5 becoming shorter; vibrissae with sparse to moderate density (Fig. 445). . . . . → 18



digits equal in length

Fig. 444 *Erignathus barbatus*



first digit longer

Fig. 445

- 18a. Adults medium-sized; muzzle and head moderate in size and somewhat flattened; nostrils pointing slightly upwards; males without enlarged nose; females with 4 mammary teats (Fig. 446) . . . . . **(Monk seal)** → 19
- 18b. Adults very large; muzzle and head very broad and deep; nostrils point ahead or down; adult males with large inflatable proboscis; females with 2 mammary teats (Fig. 447) . . . . . **(Elephant seal)** → 21

nostril crease  
just on top  
past end

inflatable proboscis  
in males

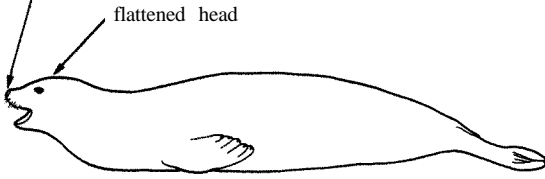


Fig. 446 Monk seal

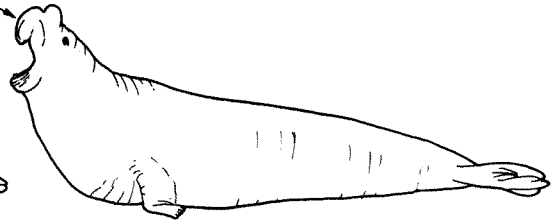


Fig. 447 Elephant seal

- 19a. Distribution limited to the North Pacific Ocean (generally the northwestern Hawaiian Islands) (Fig. 448) . . . . . **Hawaiian monk seal (*Monachus schauinslandi*)** p. 282
- 19b. Distribution limited to the North Atlantic Ocean and surrounding seas (Mediterranean, Black, and Caribbean seas, and Gulf of Mexico) . . . . . → 20



Fig. 448 *Monachus schauinslandi*

- 20a. Distribution limited to portions of the Mediterranean Sea, Black Sea, and West African coast) (Fig. 449) . . . . . **Mediterranean monk seal (*Monachus monachus*)** p. 278
- 20b. Formerly found in the Caribbean Sea and Gulf of Mexico (now considered extinct) (Fig. 450) . . . . . **West Indian monk seal (*Monachus tropicalis*)** p. 280



Fig. 449 *Monachus monachus*

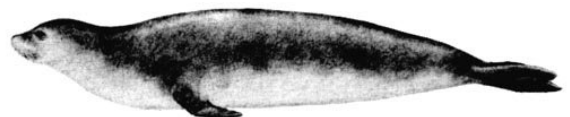


Fig. 450 *Monachus tropicalis*