

# I **CETACEI** E LE TARTARUGHE MARINE DEL MEDITERRANEO: CHIAVI DI IDENTIFICAZIONE DI SPECIE

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IZS del Piemonte, Liguria e Valle d'Aosta  
S.S. Sezione di Imperia

Evento ECM "Sorveglianza sanitaria dei Cetacei e tartarughe marine spiaggiate lungo le coste italiane. Aggiornamento sulle attività delle reti regionali del Lazio"

IZS Lazio e Toscana - Roma, 13 Dicembre 2013

# SISTEMATICA

Situazione attuale: ≥83 specie attualmente riconosciute

- **MISTICETI:**

Balene e Balenottere

dotati di fanoni; cranio  
simmetrico; 2 narici; ♀♀  
più grandi dei ♂♂; suoni a  
bassa frequenza



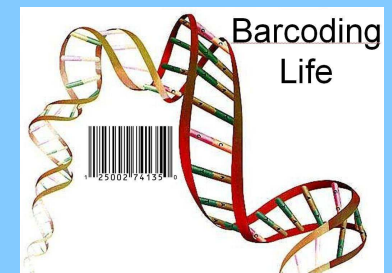
- **ODONTOCETI:**

tutti gli altri (Capodoglio,  
Orca, Globicefalo, Zifidi,  
delfini, focene, ecc.)

dotati di denti; cranio  
asimmetrico; 1 narice; ♂♂  
più grandi delle ♀♀;  
biosonar

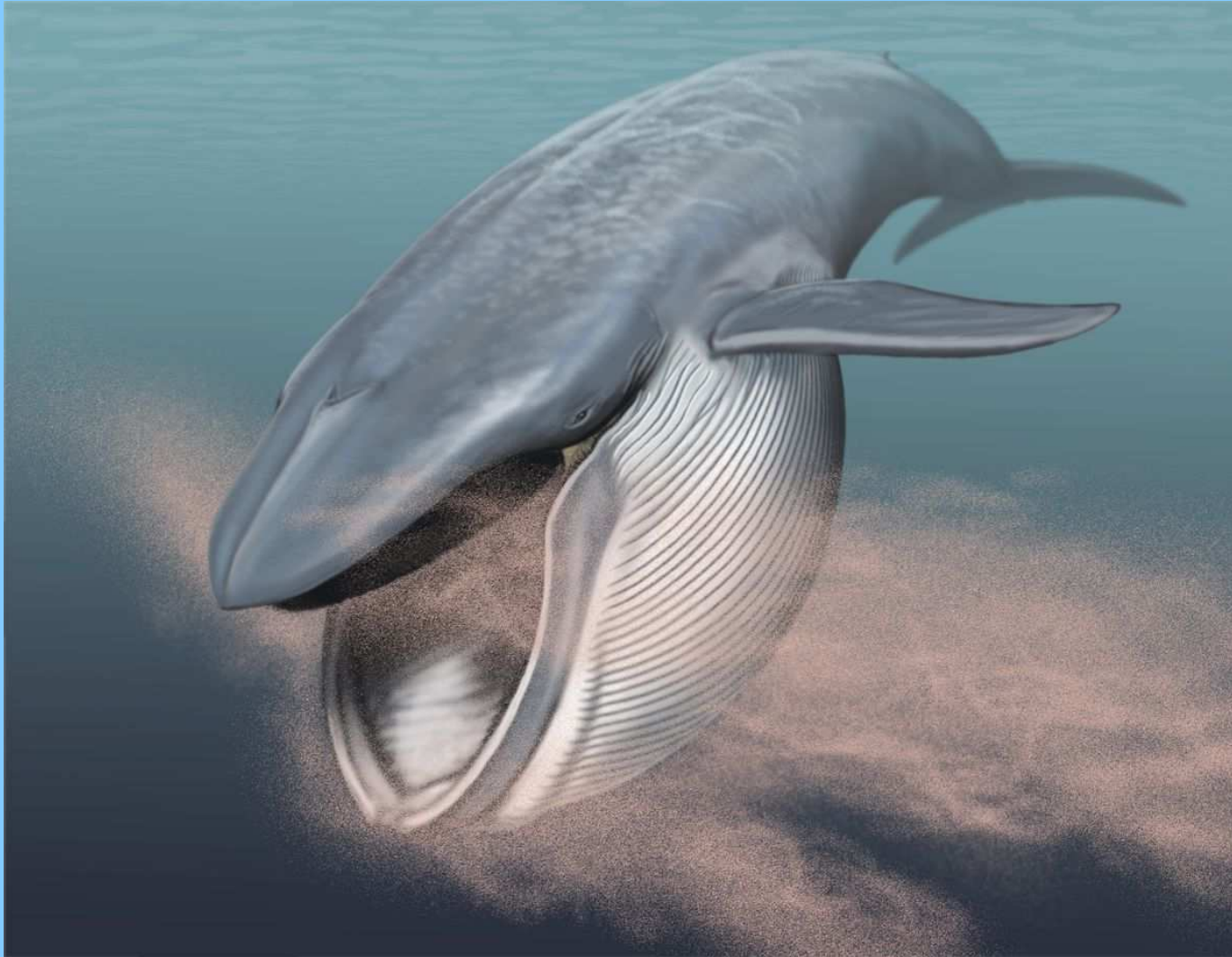


DNA barcoding





# MISTICETI: dieta basata su piccoli pesci e krill



© John Gatesy and Carl Buell

## Fanoni



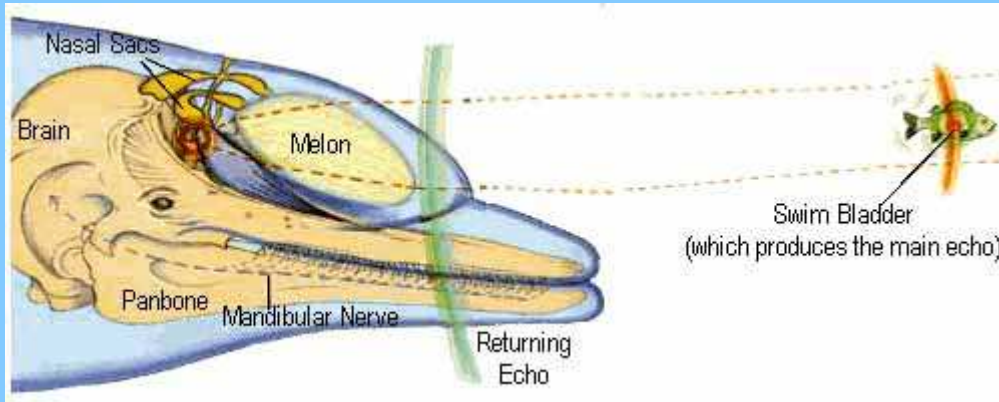
## Krill mediterraneo:

Gamberetti Eufausiacei

*Meganyctiphanes norvegica*, *Nyctiphanes couchi*

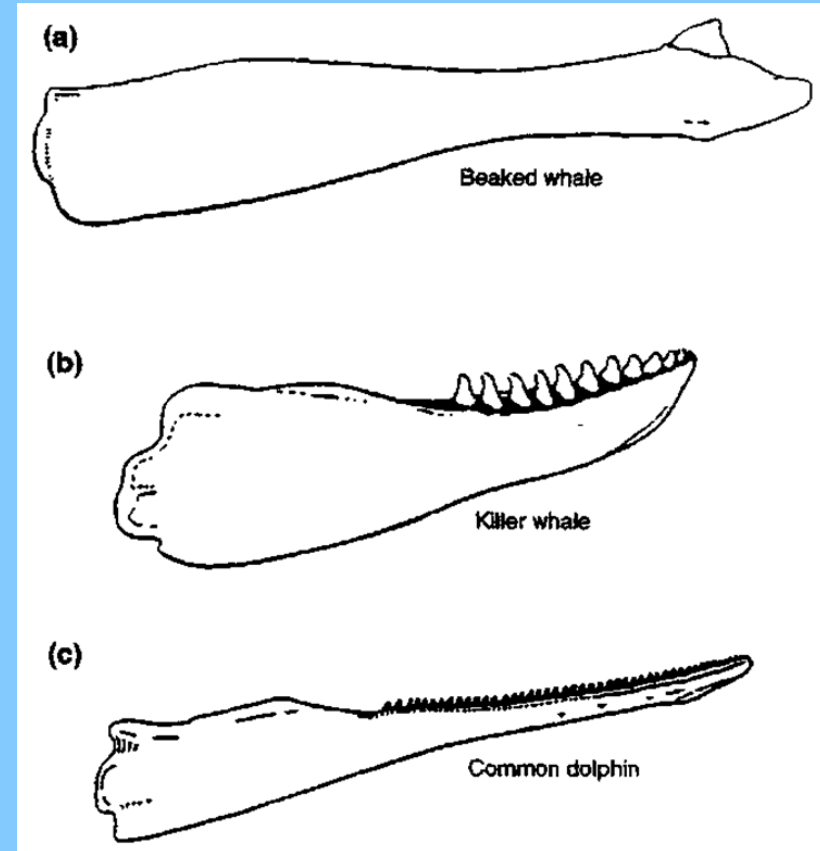
# ODONTOCETI:

## dieta basata su pesci, crostacei e molluschi cefalopodi



**Biosonar**

(© www.norcalblogs.com)

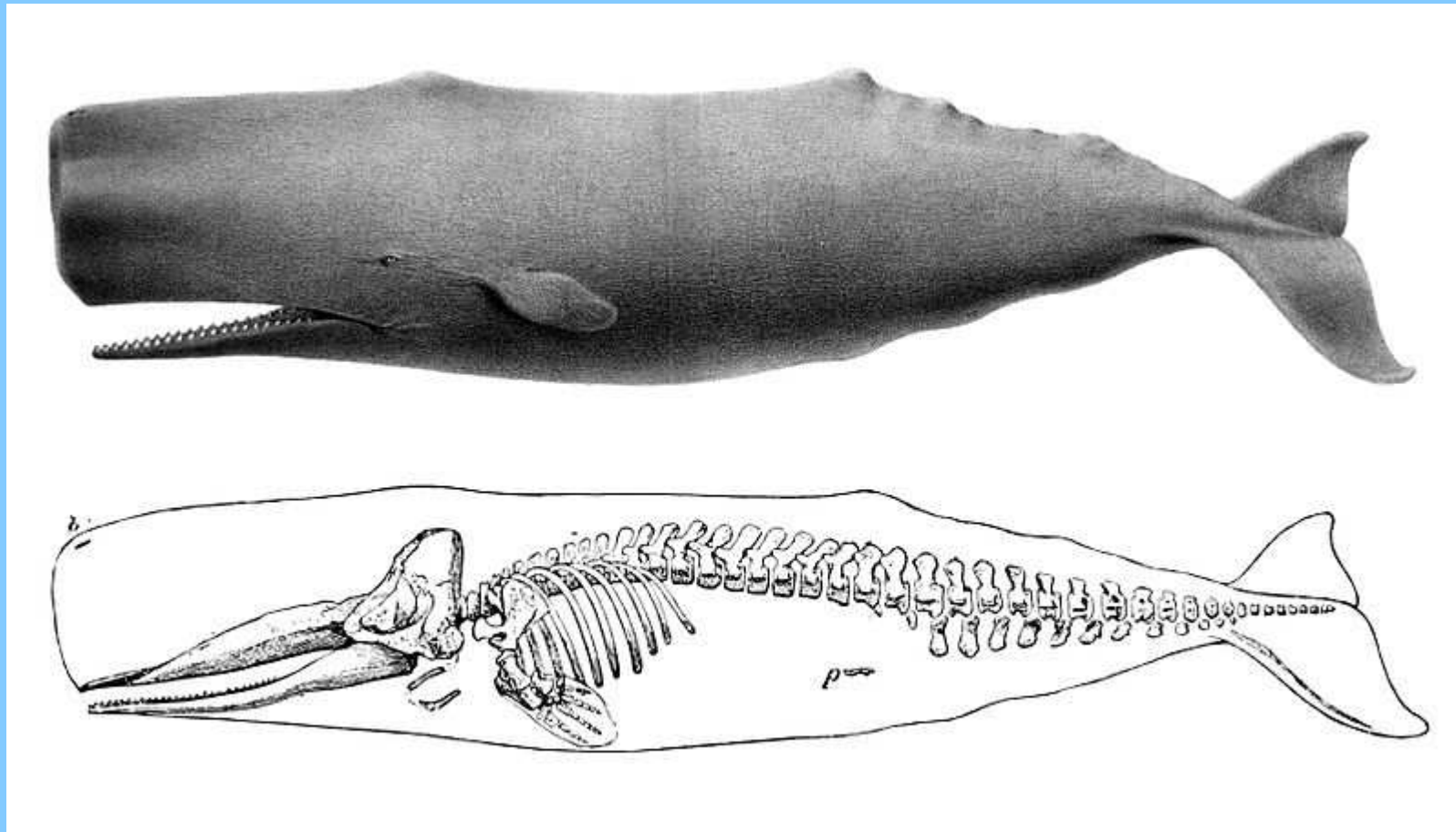


Comparison of representative lower dentitions of odontocetes: (a) beaked whale (*Ziphiidae*), (b) killer whale (*Orcinus orca*), and (c) common dolphin (*Delphinus delphis*) (Sliper, 1979, Berta and Sumich, 1999)

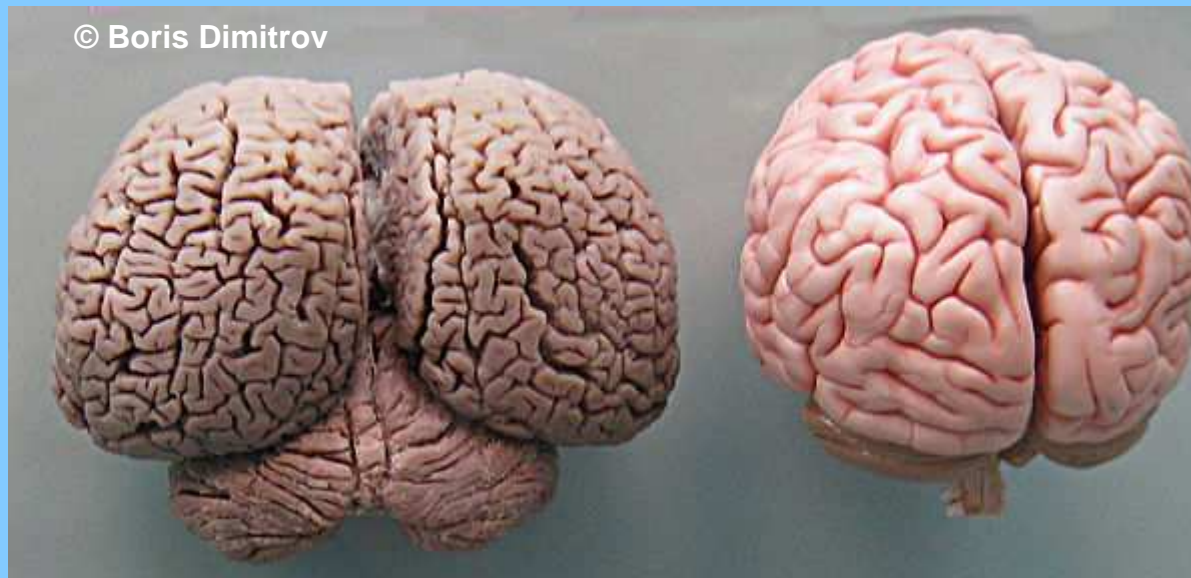
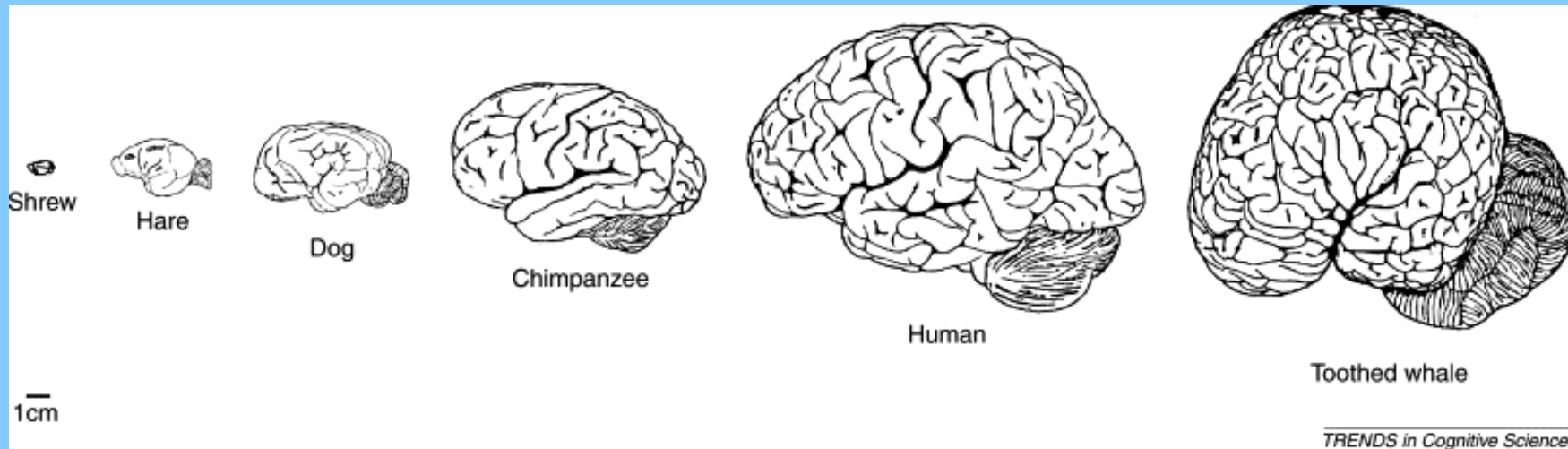


# ANATOMIA E FISIOLOGIA

- Adattamento alla vita acquatica (idrodinamicità, riduzione degli arti, adattamenti fisiologici per l'immersione, grasso a protezione dal freddo)
- Negli Odontoceti: ecolocalizzazione



# Encefalo



*Tursiops truncatus*

*Homo sapiens*



# ECOLOGIA

## Interazioni con altre specie

### Interazioni con l'uomo

- Dirette: caccia (IWC), cattura per detenzione in delfinari, cattura per impiego in operazioni militari -guerra del Golfo-, collisioni con natanti, catture accidentali in reti da pesca, competizione per le risorse ittiche (es: tursiopi e reti da pesca)
- Indirette: inquinamento, alterazione habitat e rete trofica, anthropogenic sounds (sonar militari, seismics), competizione per le risorse ittiche
- Protezione legale, convenzioni internazionali (es. ACCOBAMS), aree protette (es. Santuario Pelagos), whale watching





# Collisioni (ship strikes)



Balenottera comune, Mar Ligure

© Marco Ballardini



Megattera, Pacifico settentrionale

PHILLIP COLLA  
OCEANLIGHT.COM



Zifio, Mar Ligure

© Marco Ballardini



# Catture accidentali in reti da pesca (bycatch)

Zifio nel Mare di Alboran (Mediterraneo occidentale), estate 2009



© Marco Ballardini



© Ann Allen



# Competizione per le risorse alimentari

Tursiopi e attrezzi da pesca, Mar Ligure





# ECOLOGIA

## Interazioni con altre specie

### Lamprede

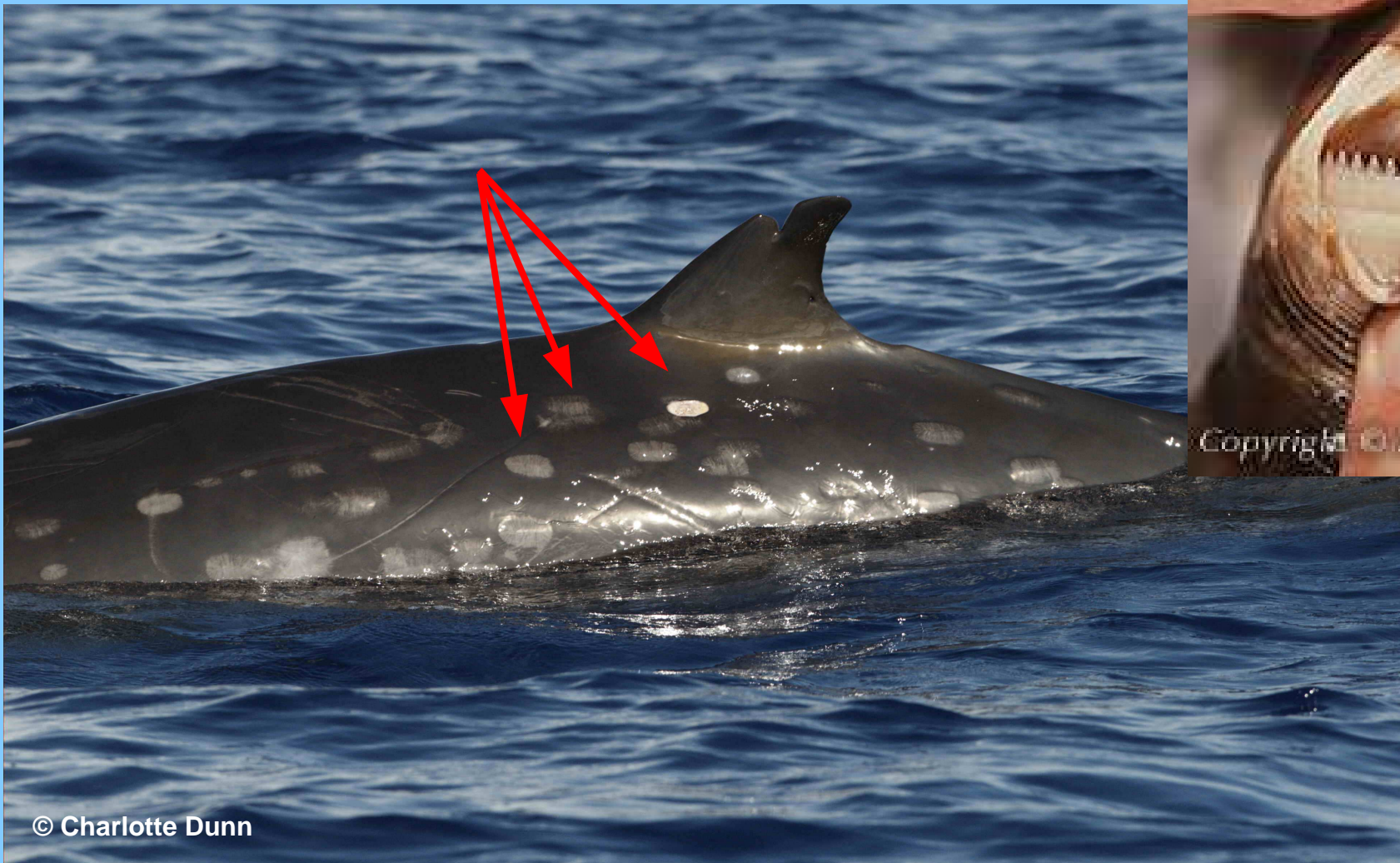




# ECOLOGIA

Interazioni con altre specie

## Cookie-cutter shark (*Isistius brasiliensis*)



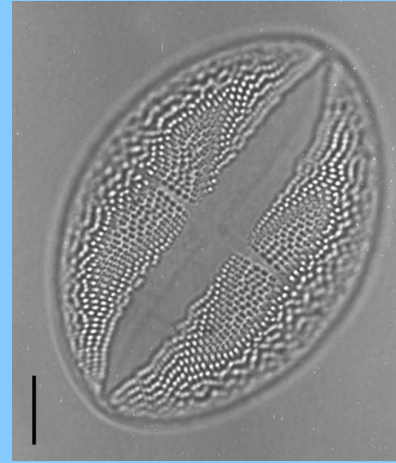
© Charlotte Dunn

Copyright © SeaPics.com

# ECOLOGIA

Interazioni con altre specie

## Diatomee epibionti



***Cocconeis* sp.**

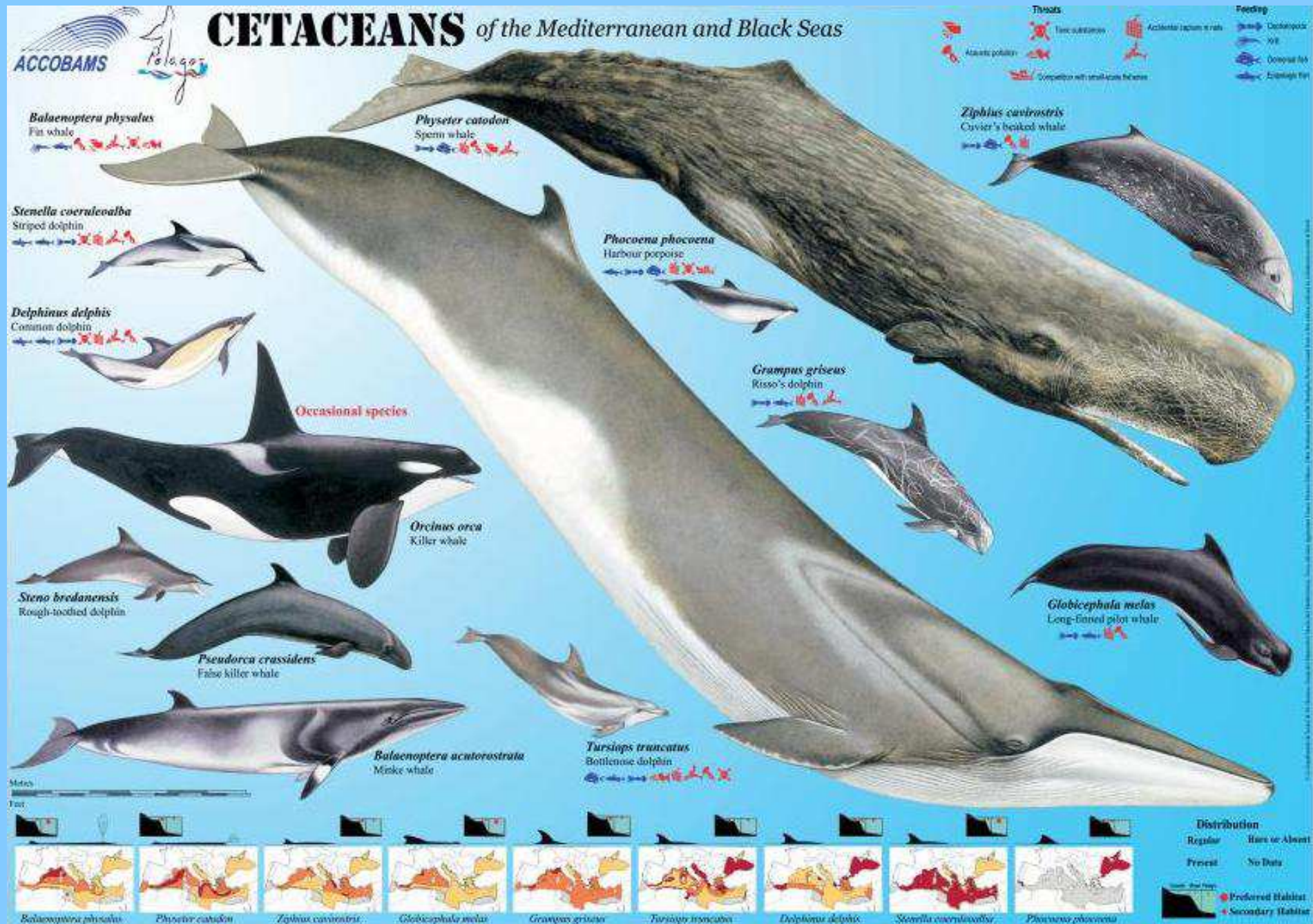
© California Academy of  
Science Diatoms collection



© Marco Ballardini

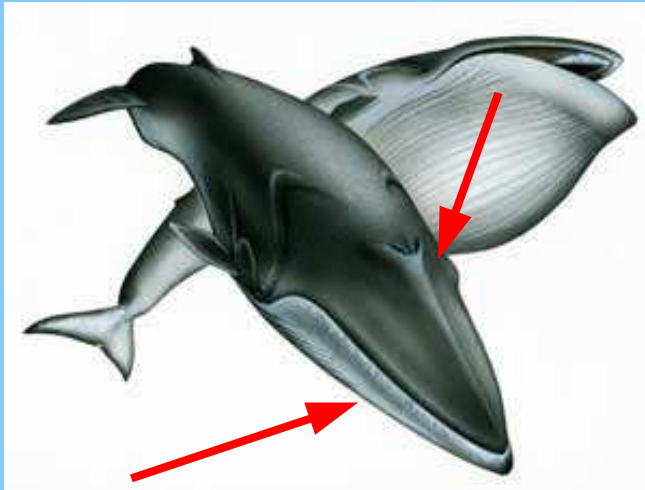


# Cetacei del Mar Mediterraneo





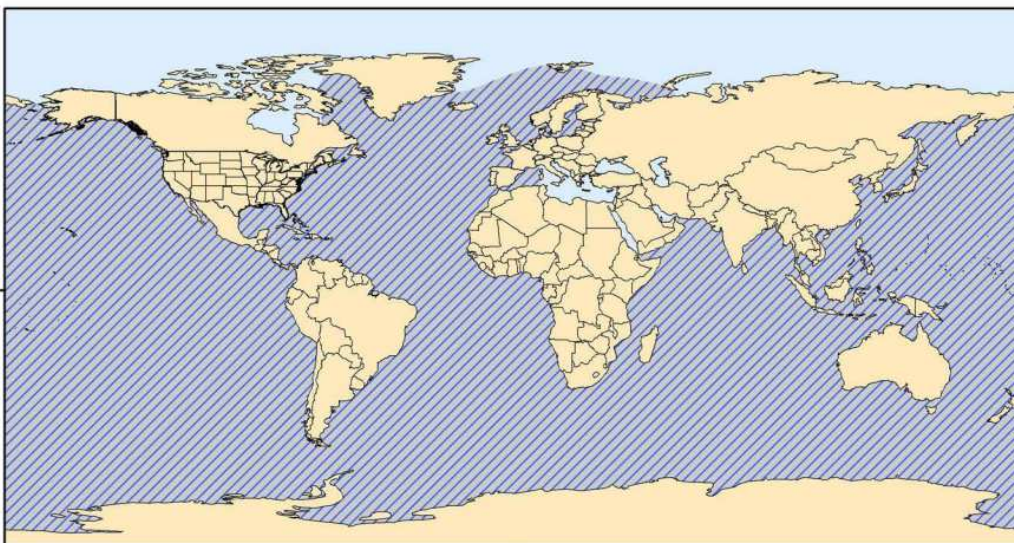
# Balenottera comune (*Balaenoptera physalus*)



*Balaenoptera physalus* © Wurtz-Artescienza



Fin Whale Range



Note: Map represents approximate range of species.

NMFS, Office of Protected Resources  
March 2009



Source: IUCN Med.



Balenottera comune  
*Balaenoptera physalus*





# Capodoglio (*Physeter macrocephalus*)

L max: ♀ 12,5m , ♂ 18,5m

L nascita: 3,5 - 4,5m

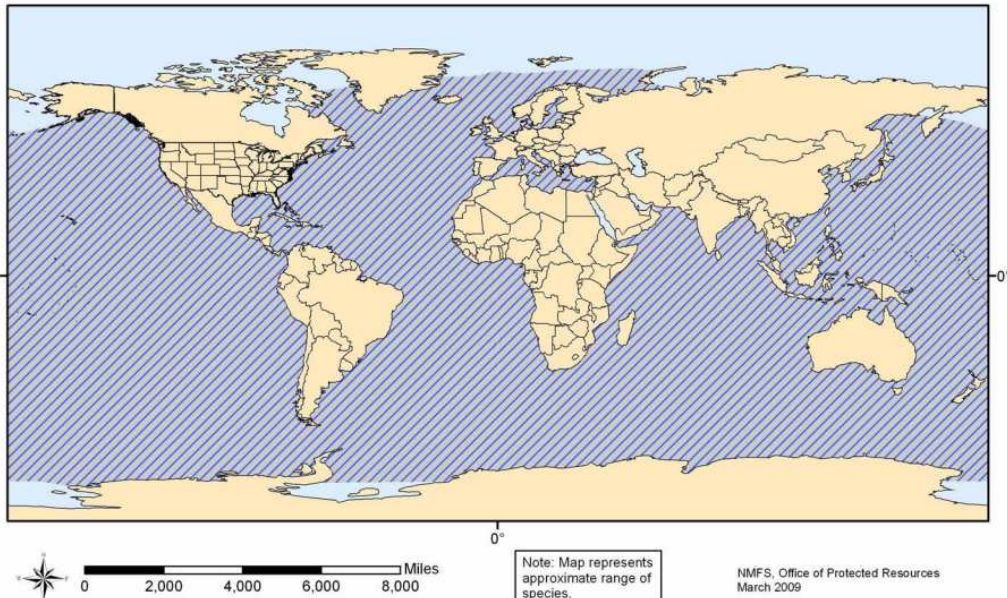


*Physeter macrocephalus* © Wurtz-Artescienza

**Denti: 36-50 nella mandibola**



Sperm Whale Range





# Capodoglio (*Physeter macrocephalus*)



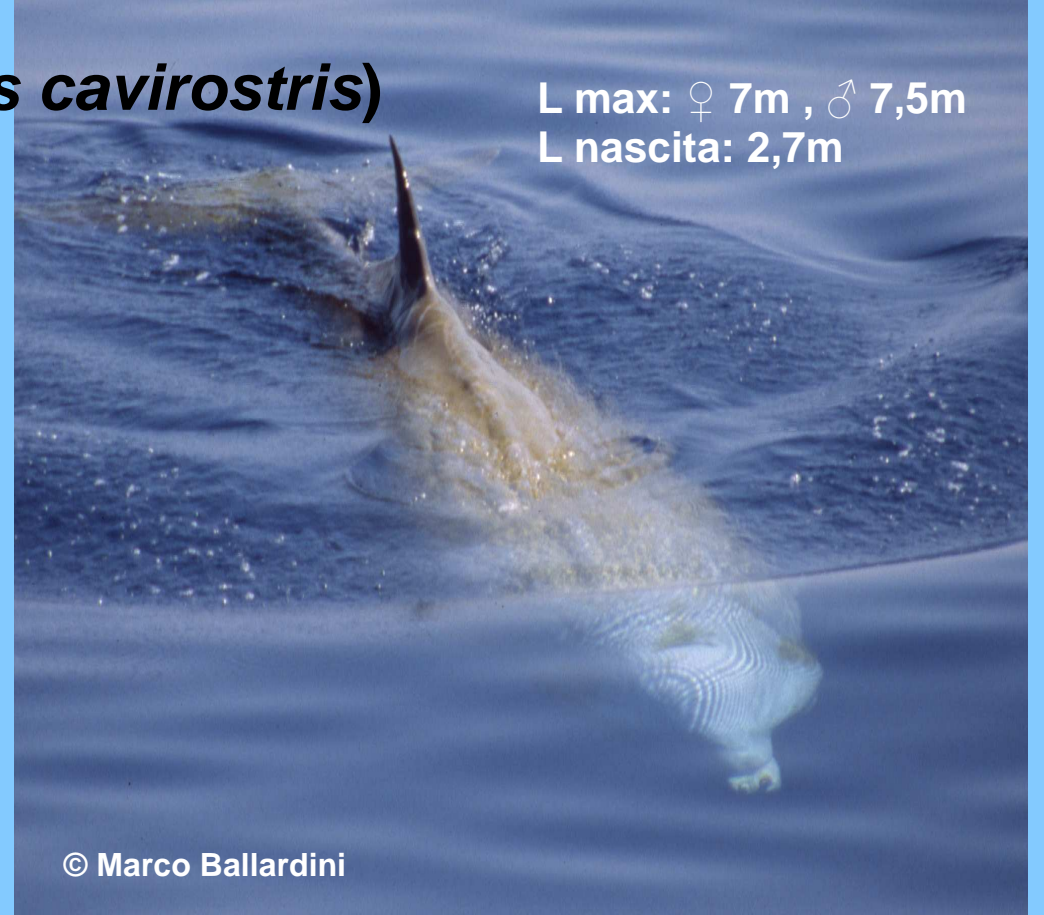


# Zifio (*Ziphius cavirostris*)

L max: ♀ 7m , ♂ 7,5m  
L nascita: 2,7m

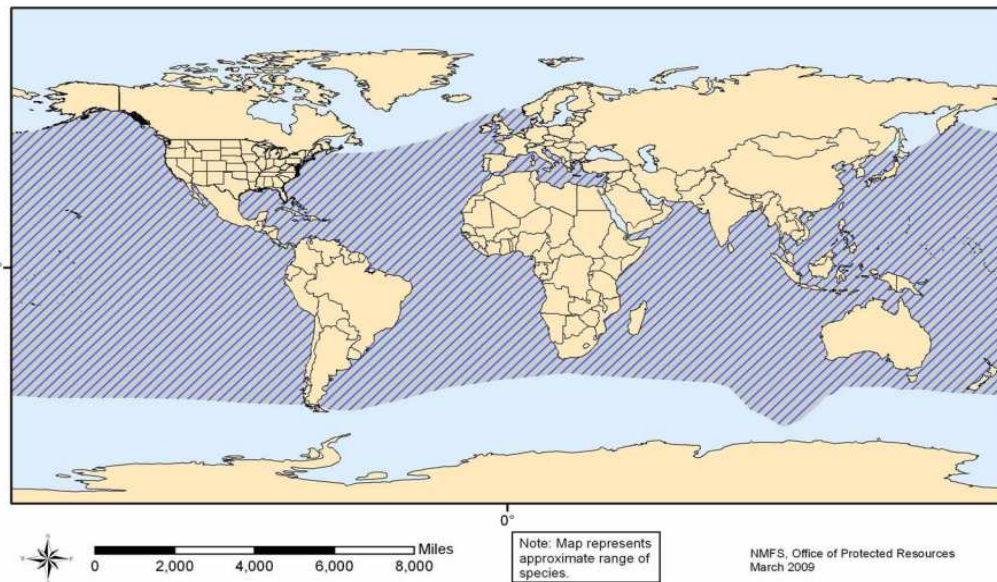


*Ziphius cavirostris* © Würtz-Artescienza



© Marco Ballardini

Cuvier's Beaked Whale Range





**Zifio**  
***Ziphius cavirostris***



© Todd Pusser



© Marco Ballardini



© Marco Ballardini



© Marco Ballardini



# *Ziphius cavirostris*

giovane ?

piccolo

♂ adulto

♀ adulta

La colorazione cambia in funzione dell'età e del sesso.... ed il biofilm di Diatomee complica il quadro!





# Globicefalo (*Globicephala melas*)

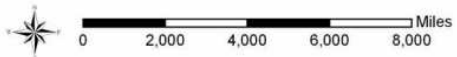
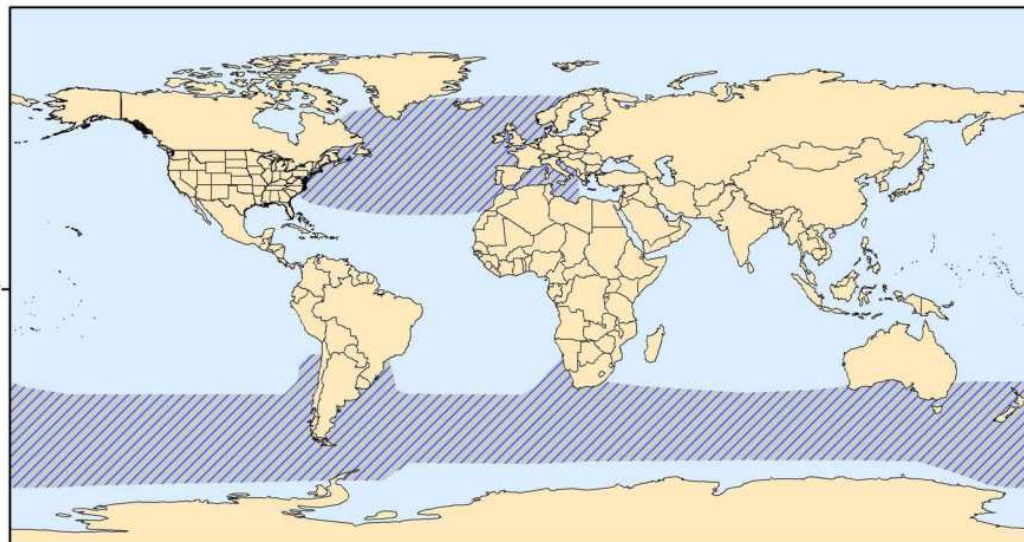


*Globicephala melas* © Würtz-Artescienza

L max: ♀ 5,7m , ♂ 6,7m  
L nascita: 1,7 – 1,8m



Long-Finned Pilot Whale Range



Note: Map represents approximate range of species.

NMFS, Office of Protected Resources  
March 2009



Source: IUCN Med

Denti: 8 – 13 paia su ogni mascella



**Globicefalo**  
*Globicephala melas*





# Globicefalo (*Globicephala melas*)

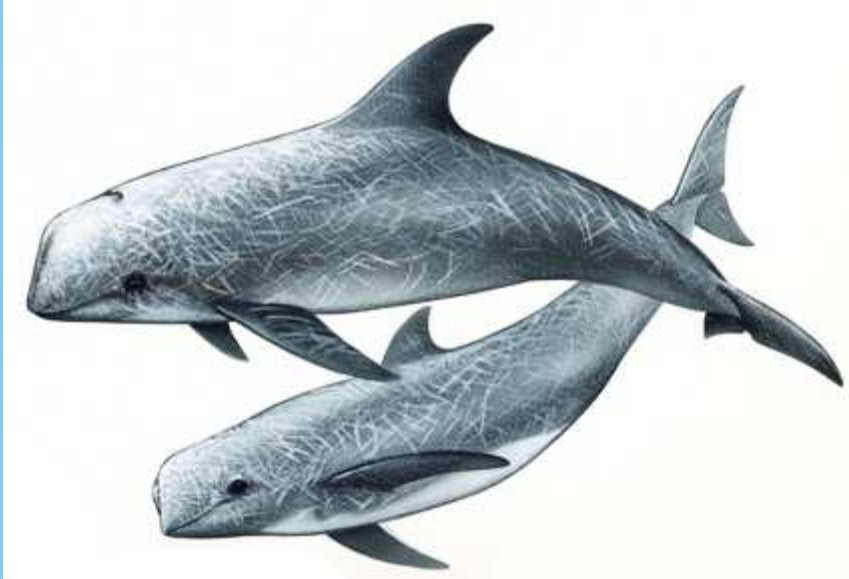
♂ adulto

♀ adulta

piccolo



# Grampo (*Grampus griseus*)



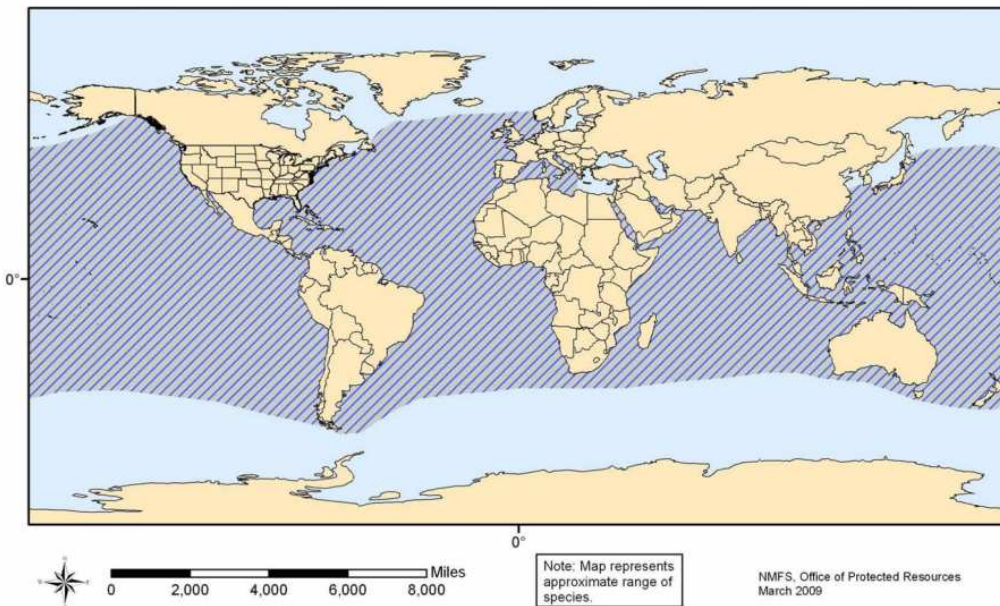
*Grampus griseus* © Würtz-Artescienza



L max: ♀ 3,6m , ♂ 3,8m  
L nascita: 1,5m

© Marco Ballardini

Risso's Dolphin Range



**Denti: 2-7 paia sulla mandibola**



# Grampo (*Grampus griseus*)





# Grampo (*Grampus griseus*)



© Marco Ballardini



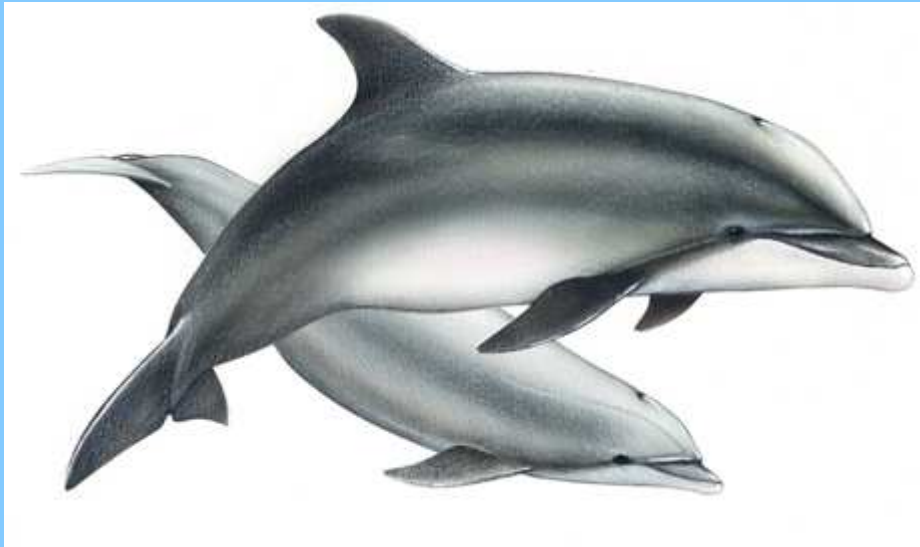
© Marco Ballardini



© Marco Ballardini



# Tursiope (*Tursiops truncatus*)



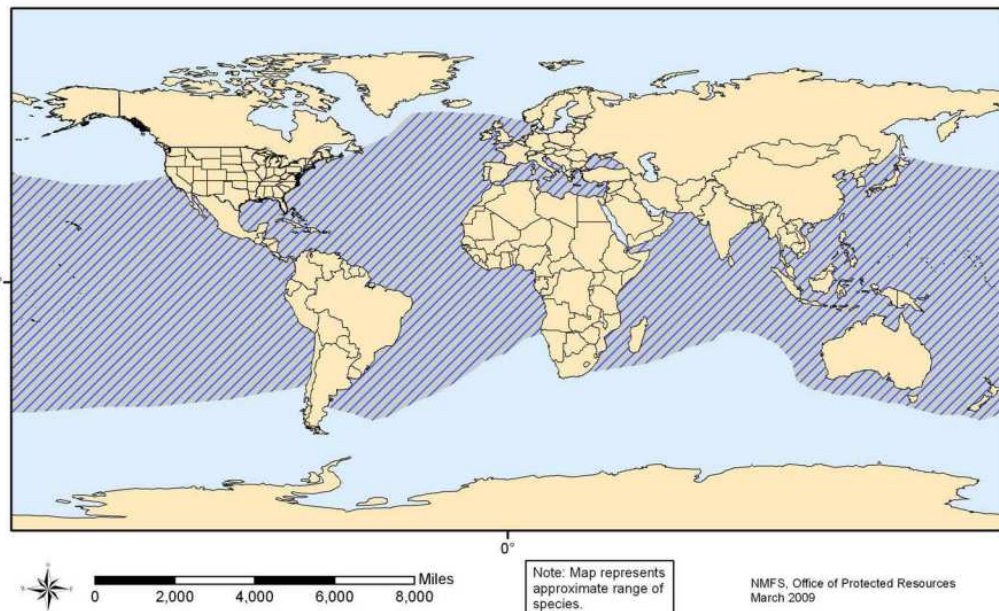
*Tursiops truncatus* © Würtz-Artescienza



L max: ♀ 3,2m , ♂ 3,3m  
L nascita: 1m

© Marco Ballardini

Bottlenose Dolphin Range



Denti: 18-26 paia su ogni mascella



# Tursiope (*Tursiops truncatus*)



© Marco Ballardini



© Marco Ballardini



# Stenella striata (*Stenella coeruleoalba*)



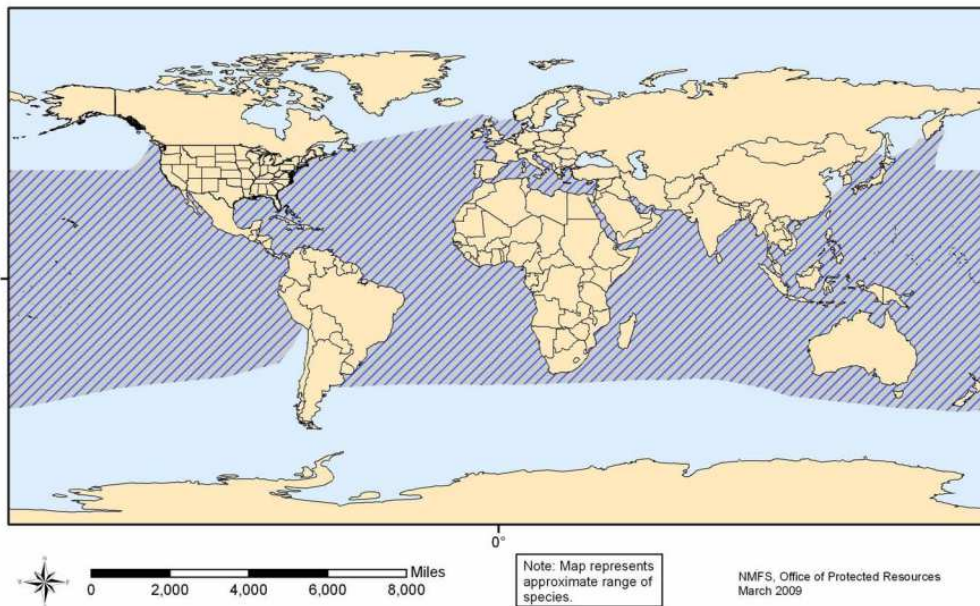
*Stenella coeruleoalba* © Würtz-Artescienza



L max: ♀ 2m , ♂ 2,5m  
L nascita: 0,8m

© Marco Ballardini

Striped Dolphin Range



Denti: 80-110 per mascella



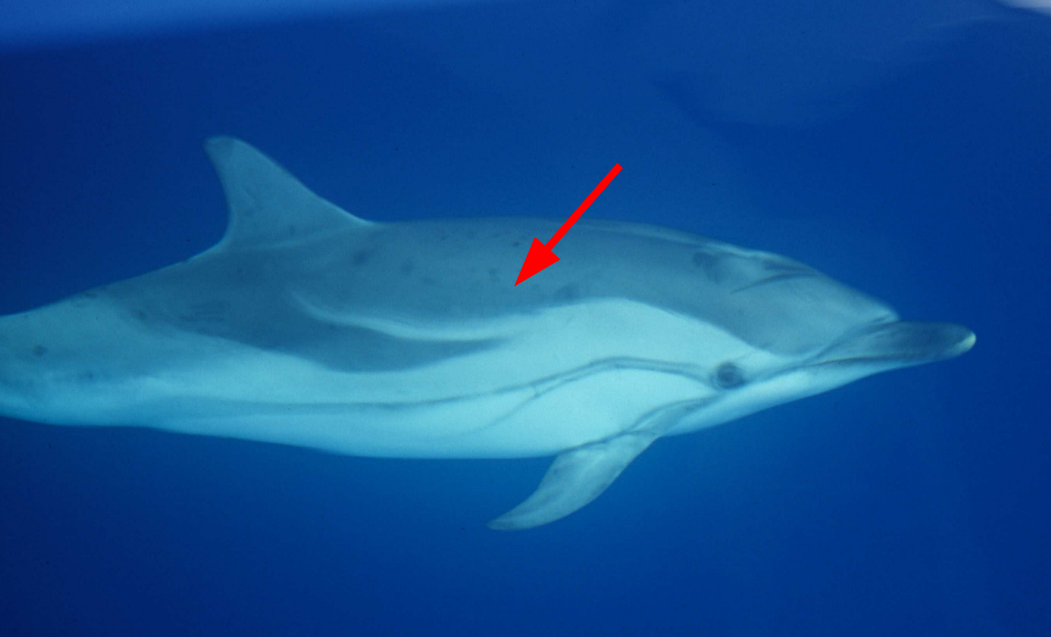
**Stenella striata**  
***Stenella coeruleoalba***





# ***Stenella striata***

Variabilità individuale nella colorazione





# Delfino comune (*Delphinus delphis*)



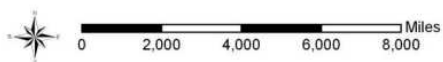
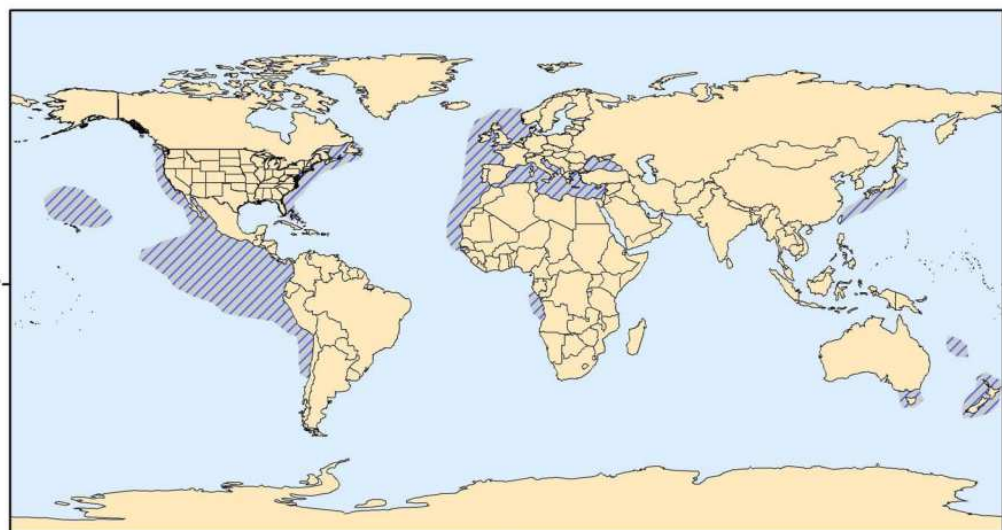
*Delphinus delphis* © Wurtz-Artescienza



L max: ♀ 2,4m , ♂ 2,6m  
L nascita: 0,8m

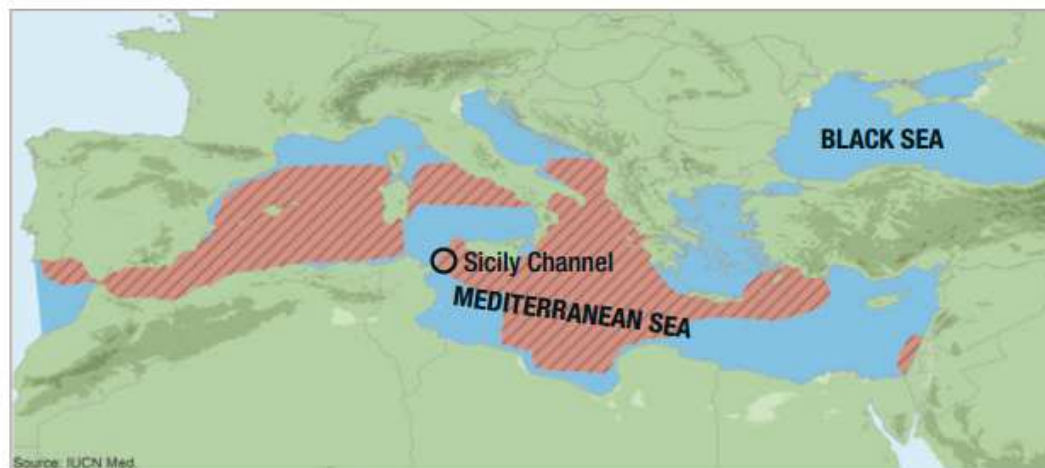
© Marco Ballardini

Short-Beaked Common Dolphin Range



Note: Map represents  
approximate range of  
species.

NMFS, Office of Protected Resources  
March 2009



Source: IUCN Med

Denti. 80-120 per mascella



# Steno (*Stenus bredanensis*)



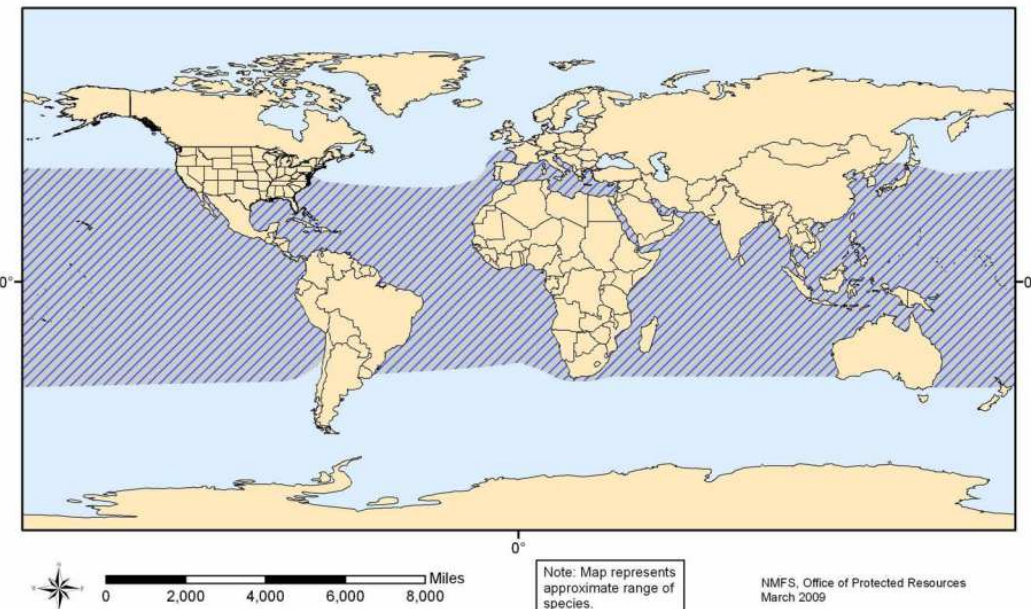
*Steno bredanensis* © Wurtz-Artescienza



L max: ♀ 25m , ♂ 2,6m  
L nascita: 0,8m

Photo: © Thomas Jefferson

Rough-Toothed Dolphin Range



**Denti: 40-54 per mascella**

Notarbartolo di Sciara & Birkun. Conservation of cetaceans in the Mediterranean and Black Seas.

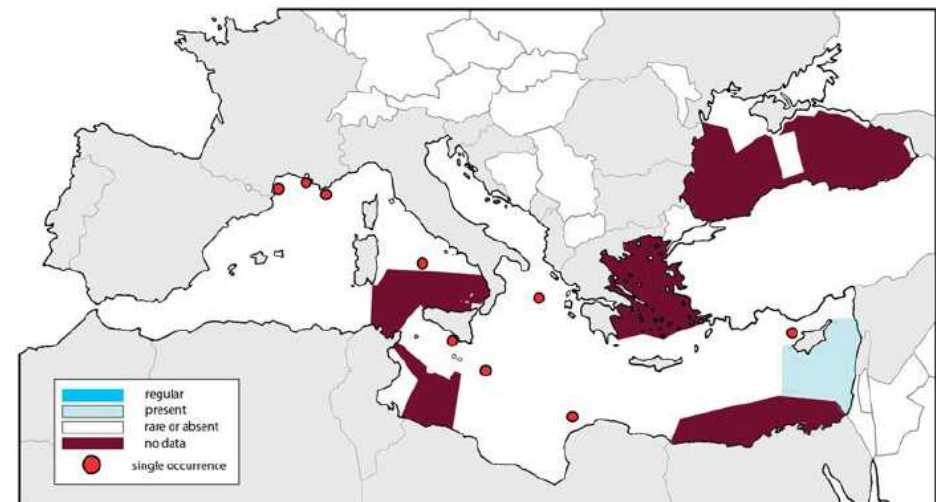


Fig. 14. Presumed distribution and known occurrences of *Steno bredanensis* in the ACCOBAMS area (details in Table 8).



## Specie occasionali

### Misticeti:

- Balenottera minore *Balaenoptera acutorostrata*
- Balenottera boreale *Balaenoptera borealis*
- Megattera *Megaptera novaeangliae*
- Balena franca *Eubalaena glacialis*

### • Odontoceti:

- Pseudorca *Pseudorca crassidens*
- Mesoplodonte spp. *Mesoplodon* spp.
- Cogia *Kogia sima*



# Balenottera minore (*Balaenoptera acutorostrata*)



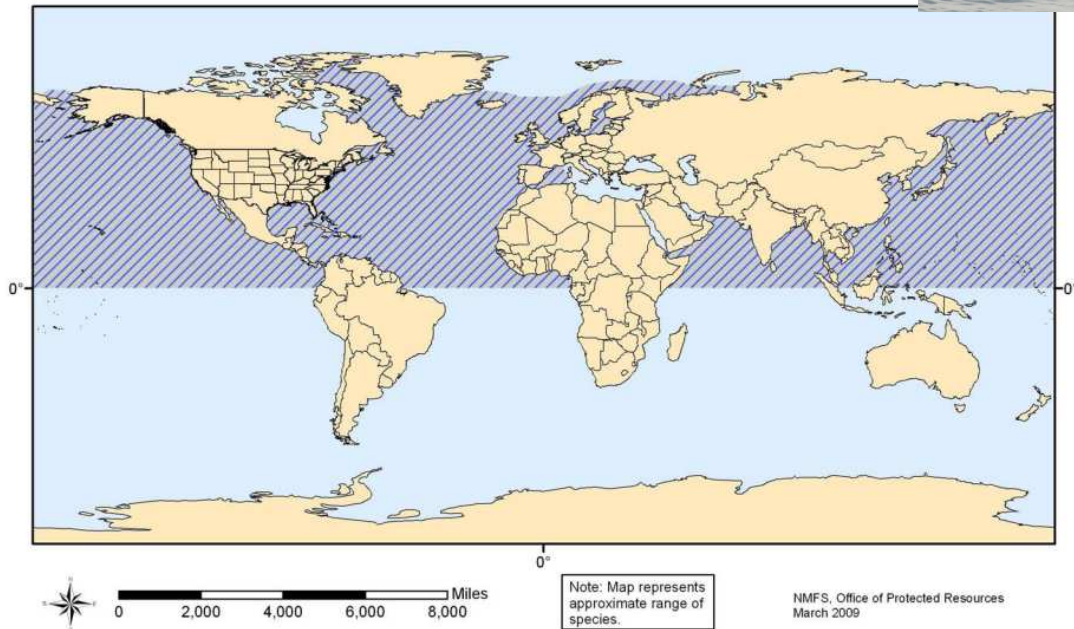
*Balaenoptera acutorostrata* © Wurtz-Artescienza

L max: ♀ 10,7m , ♂ 9,8m  
L nascita: 2,4 – 2,8m



© Jean Gagnon

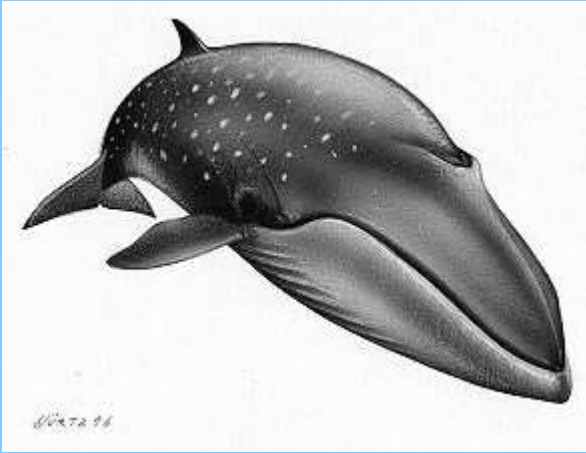
Minke Whale Range



NMFS, Office of Protected Resources  
March 2009



# Balenottera boreale (*Balaenoptera borealis*)



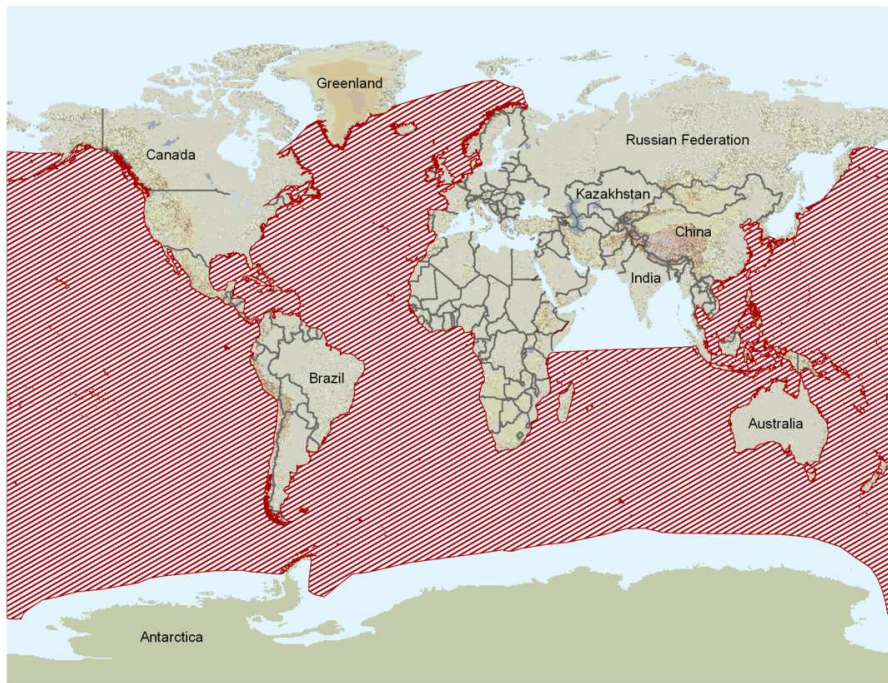
*Balaenoptera borealis* © Wurtz-Artescienza

L max: ♀ 20m , ♂ 17,7m

L nascita: 4,5m



© orcaweb.org.uk



*Balaenoptera borealis*

range type

Native (resident)

— national boundaries

----- subnational boundaries



gall stereographic central point: 0°, 0°

map created 05/21/2009



# Megattera (*Megaptera novaeangliae*)

L max: 18m

L nascita: 4 - 5m



Humpback Whale Range

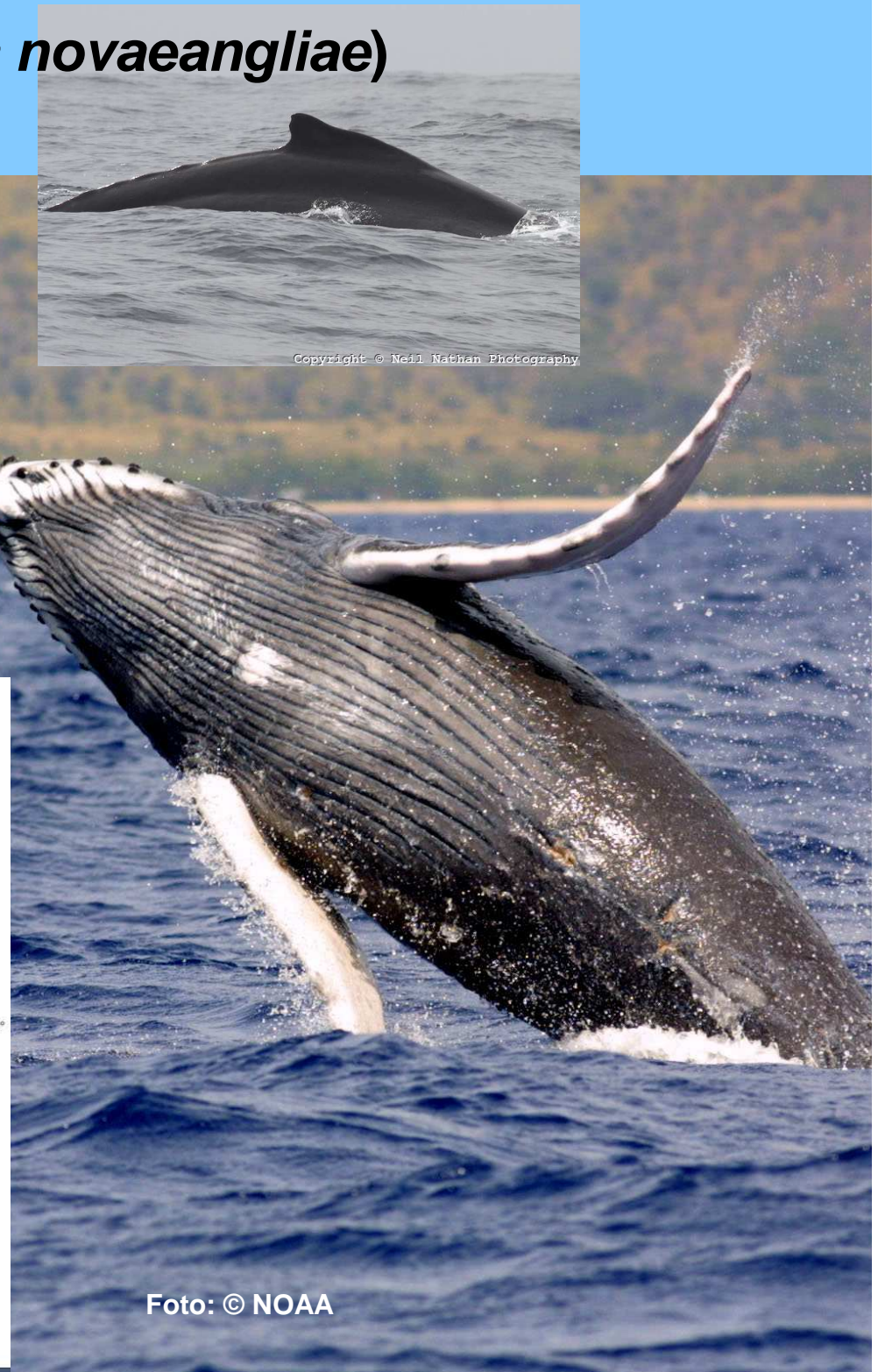
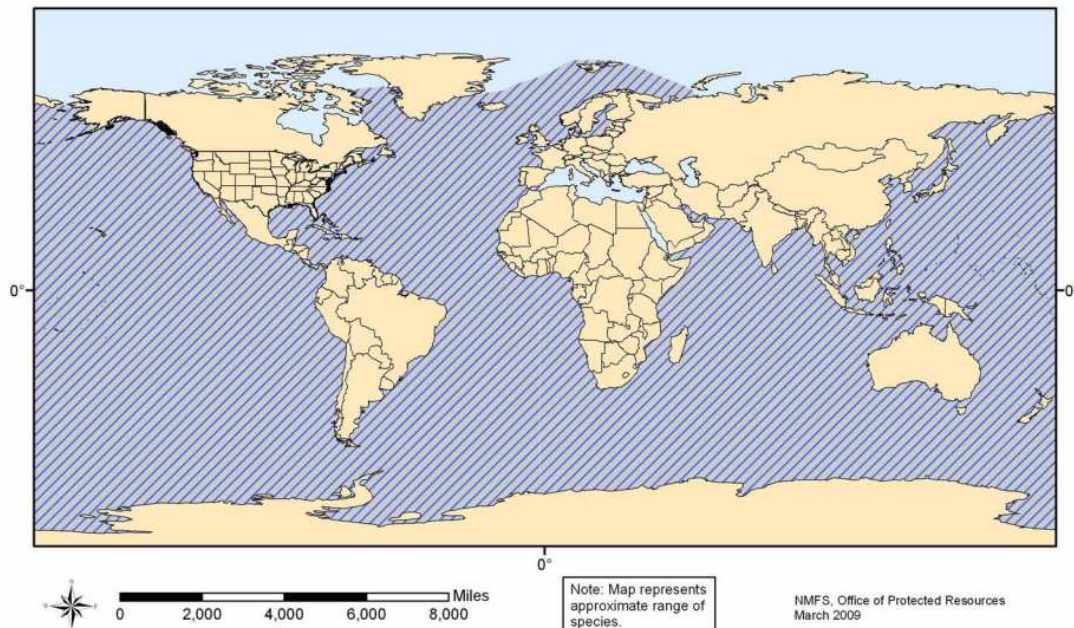


Foto: © NOAA



# Balena franca boreale (*Eubalaena glacialis*)



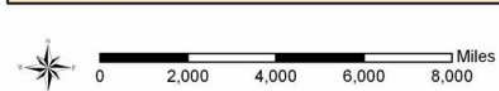
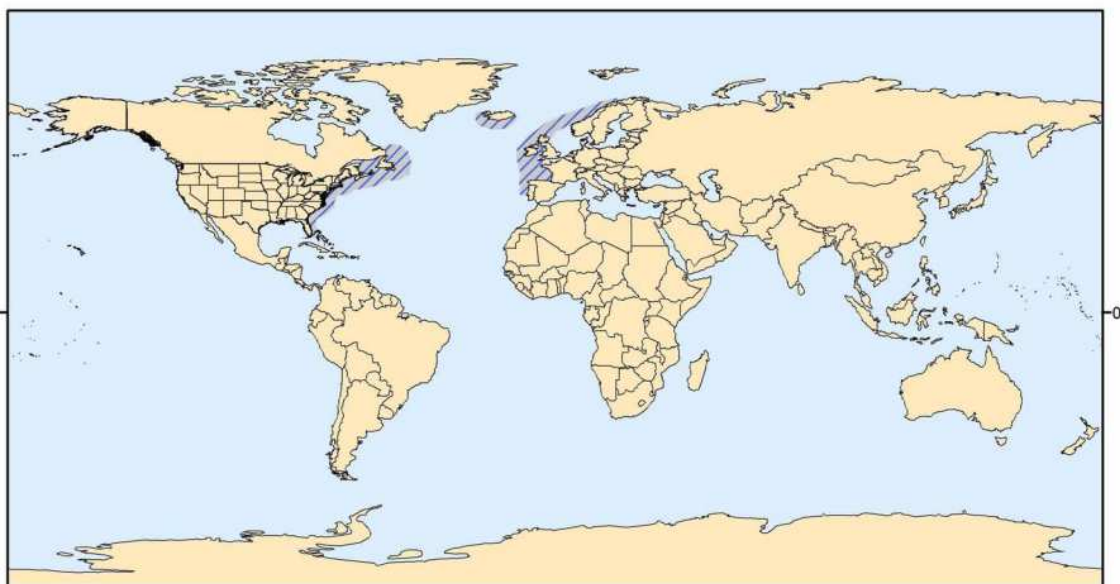
© Pieter Folkens

L max: ♀ 18,3m , ♂ 17,1m  
L nascita: 4 - 6m



© NOAA

North Atlantic Right Whale Range



Note: Map represents approximate range of species.

NMFS, Office of Protected Resources  
March 2009

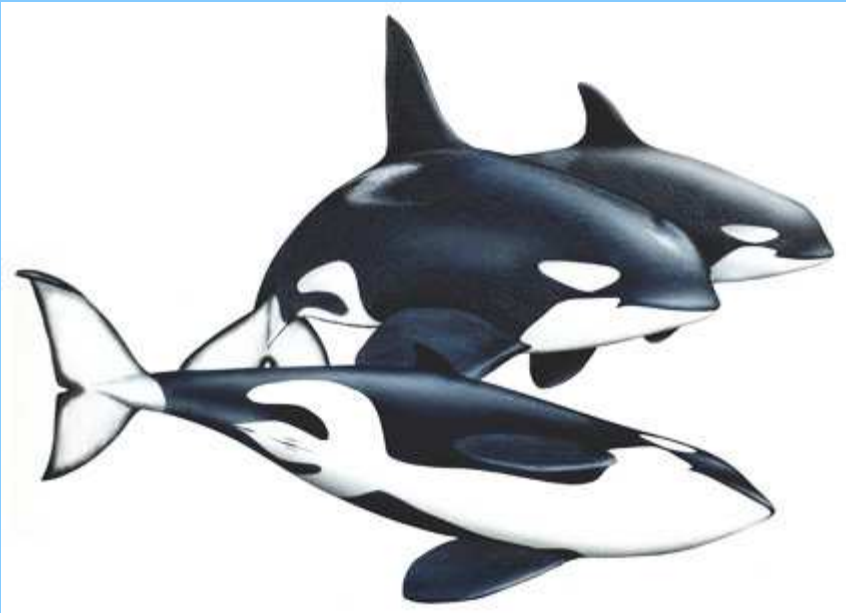


© NOAA



# Orca (*Orcinus orca*)

L max: ♀ 8,5m , ♂ 9,8m  
L nascita: 2 - 2,5m



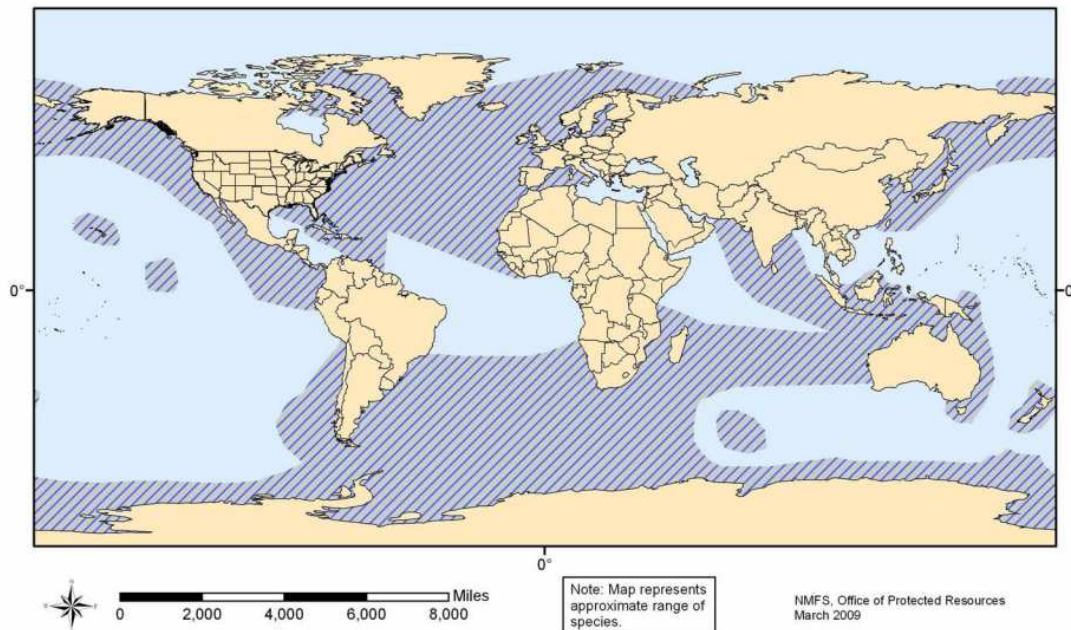
*Orcinus orca* ©Wurtz-Artescienza



Foto: © Nette Bini

**Denti: 20-24 per mascella**

## Killer Whale Range



Notarbartolo di Sciara & Birkun. Conservation of cetaceans in the Mediterranean and Black Seas.

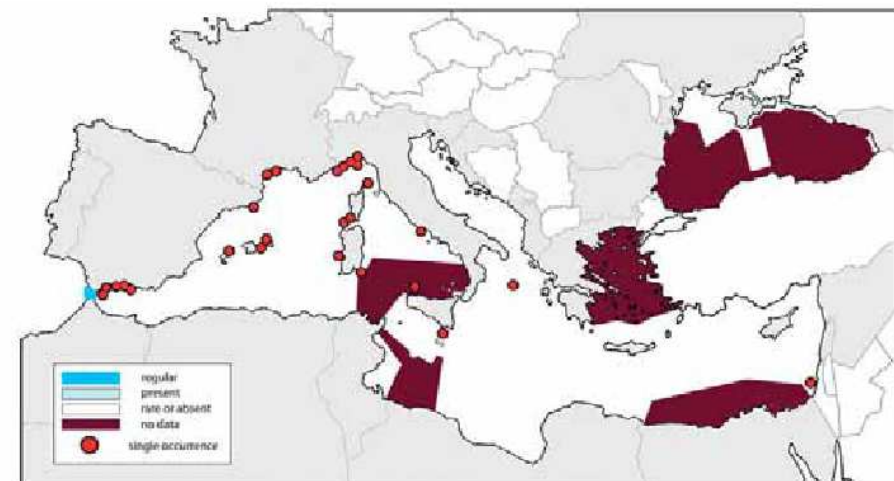


Fig. 8. Presumed distribution and known occurrences of *Orcinus orca* in the ACCOBAMS area (details in Table 7).



# Orca (*Orcinus orca*)

## *Orcinus orca* A diversified portfolio

## KILLER WHALES *Ecotypes & Forms*



**1** A large (perhaps to 9.5 m/31 ft), black and white form; it migrates to Antarctica during the austral (southern) summer where it forages in open (ice free) waters and feeds mainly on minke whales and occasionally elephant seals. During the winter, it probably migrates to lower latitudes, perhaps to the tropics.



**2** A large, two-toned gray and white form with dark cape pattern and very large eye patch. Often has yellowish cast due to diatoms. Circumpolar, it forages mainly in loose pack ice where it preys on ice seals (prefers Weddell seals), which groups wave-wash off ice floes by creating waves with their tails; occasionally takes minke whales.



**3** A medium-sized, two-toned gray and white form with a dark cape pattern and large white eye patch. Often appears yellowish due to diatom infestation. Common around Antarctic Peninsula, especially in the Gerlache Strait. Preferred prey unknown but has been seen feeding on penguins on numerous occasions.



**4** The smallest killer whale known – adult males reach only 6 m (20 ft). A two-toned gray and white form with a dark gray cape; often colored yellowish by diatom film. Eye patch is distinctively narrow and slanted. Occurs deep in the pack ice in eastern Antarctica and feeds on fish; especially common in the Ross Sea.



**5** Recently described form, known from perhaps a dozen sightings. Easily recognized by its tiny eye patch (all ages); head is rounded, dorsal fin often swept back and pointy. Distribution circumglobal in subantarctic waters (north of 60°S); sometimes associated with islands. Preferred prey unknown but reportedly steals fish off longlines.



### 1 Antarctic Type A Killer Whale



### 2 Pack Ice Killer Whale (large type B)



### 3 Gerlache Killer Whale (small type B)



### 4 Ross Sea Killer Whale (type C)



### 5 Subantarctic Killer Whale (type D)



### 6 Resident Killer Whale



### 7 Bigg's Killer Whale (transient)



### 8 Offshore Killer Whale



### 9 Type 1 Eastern North Atlantic



### 10 Type 2 Eastern North Atlantic



**6** The best-known killer whale. A medium-large (to 7.2 m), black and white form that lives in coastal waters of the North Pacific. Saddle patch often has a large black intrusion ('open' saddle) not found in other killer whales. A fish-specialist – some populations feed almost exclusively on salmon. Females may live to 80-90 years.



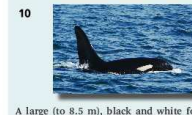
**7** A large (perhaps 8 m), black and white form – similar to resident killer whale except it lacks an open saddle. Occurs in coastal and offshore waters of the North Pacific. A mammal-eater, it feeds mostly on harbor seals and minke whales but will also take sea lions, otters, calves of large whales, etc. Named after pioneer killer whale researcher – Michael Bigg.



**8** A smaller form (to 6.7 m) rarely observed because it occurs mainly over outer continental shelf of eastern North Pacific. Group size usually large (100-200); ranges widely; some groups travel between Alaska and southern California. Apparently feeds extensively on sharks and teeth are often worn to gum line due to rough skin of sharks.



**9** A smaller (to 6.6 m), black and white form, currently known only from the North Atlantic. Off Norway, feeds on herring and mackerel, which are cooperatively herded into dense schools; some individuals have also been seen to take seals. Teeth of this form are often worn smooth to the gum line – perhaps from feeding on sharks also.



**10** A large (to 8.5 m), black and white form (only recently recognized, but with a distinctive back-sloping white eye patch. Few recorded observations, but currently known only from the North Atlantic where it is known to prey on other cetaceans, especially minke whales.

The killer whale (*Orcinus orca*) occurs in all the world's oceans where it is the top marine predator and perhaps the most widespread vertebrate on earth. Although currently considered to be a single, worldwide species, recent research has revealed that there are at least 10 recognizable forms (or ecotypes) of killer whales, which are shown here drawn to scale. For the most part, these forms have different prey preferences, distributions, social structures, foraging behaviors, acoustics, physical features, and genetics. This has led some researchers to suggest that there is more than one species of killer whale, and perhaps several. Our research seeks to understand the taxonomy and role of these predators in marine ecosystems.

<http://swfsc.noaa.gov/prd-killervhale/>

Illustration and design: Uko Gorter ([www.ukogorter.com](http://www.ukogorter.com)) Text: R. L. Pitman, Southwest Fisheries Science Center, NOAA Fisheries Service, Robert.Pitman@noaa.gov Photo credits: R.L. Pitman (1,2,4,7); John Durban (3,6); Paul Tixier (5); Paul Wade (8); Andy Foote (9); Lewis Drysdale (10)



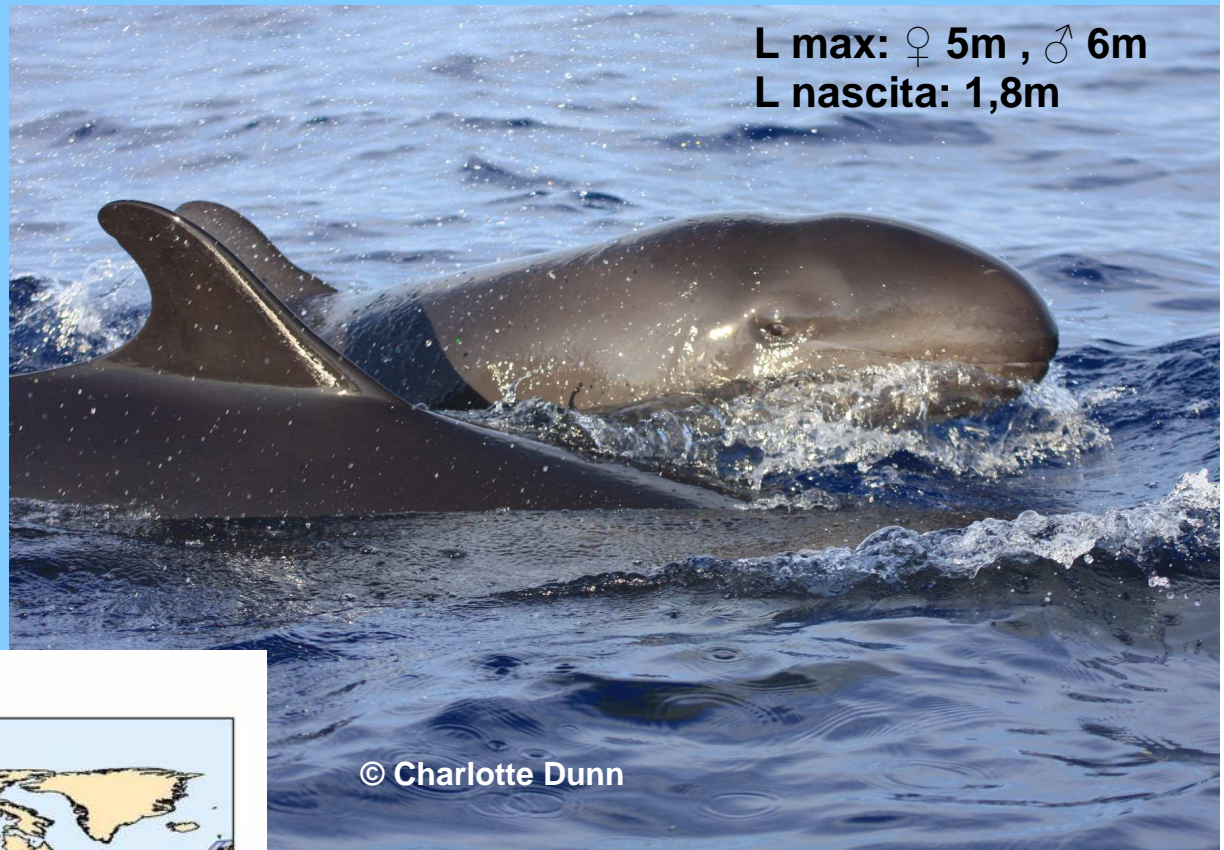


# Pseudorca (*Pseudorca crassidens*)



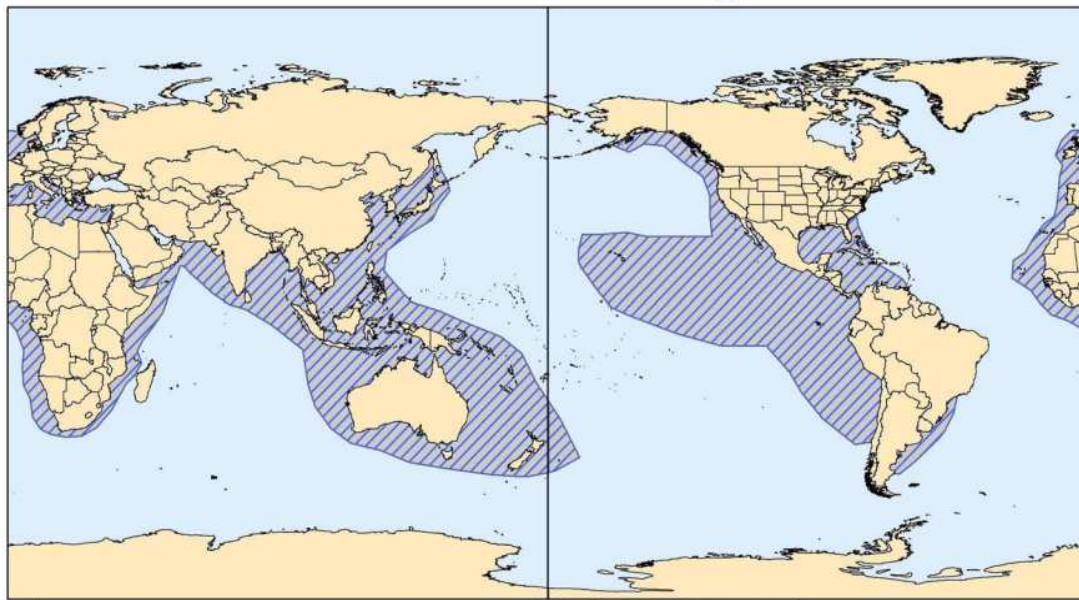
*Pseudorca crassidens* © Wurtz-Artescienza

**Denti: 14-24 per mascella**



L max: ♀ 5m , ♂ 6m  
L nascita: 1,8m

© Charlotte Dunn



False Killer Whale Range

Map represents approximate range of species. Offshore distances are approximate.

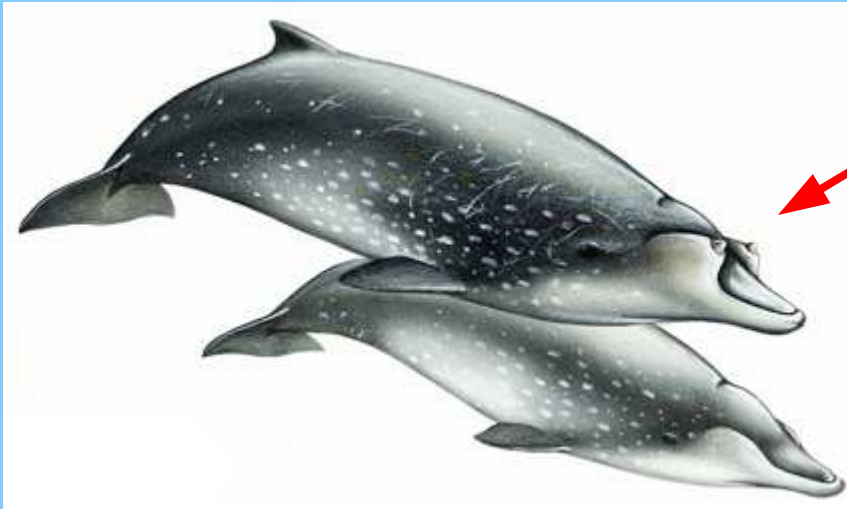
NMFS, Office of Protected Resources  
December 2007



© Marco Ballardini



# Mesoplodonte di Blainville (*Mesoplodon densirostris*)



*Mesoplodon densirostris* © Wurtz-Artescienza

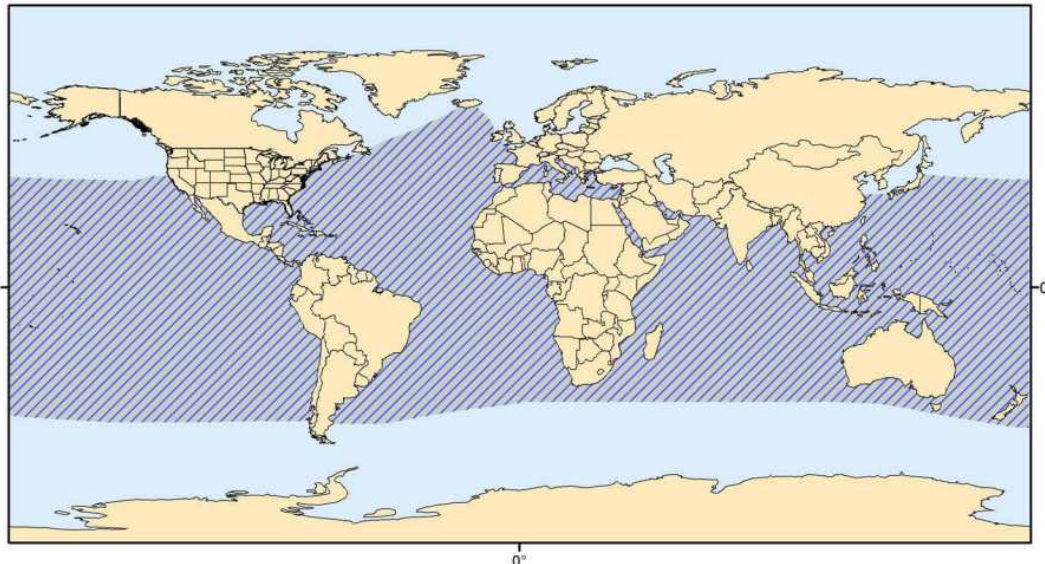


© Charlotte Dunn



© Charlotte Dunn

Blainville's Beaked Whale Range



Note: Map represents approximate range of species.

NMFS, Office of Protected Resources  
March 2009

L max: ♀ 4,7m , ♂ 5,8m  
L nascita: 2 – 2,6m



# Mesoplodonte europeo (*Mesoplodon europaeus*)

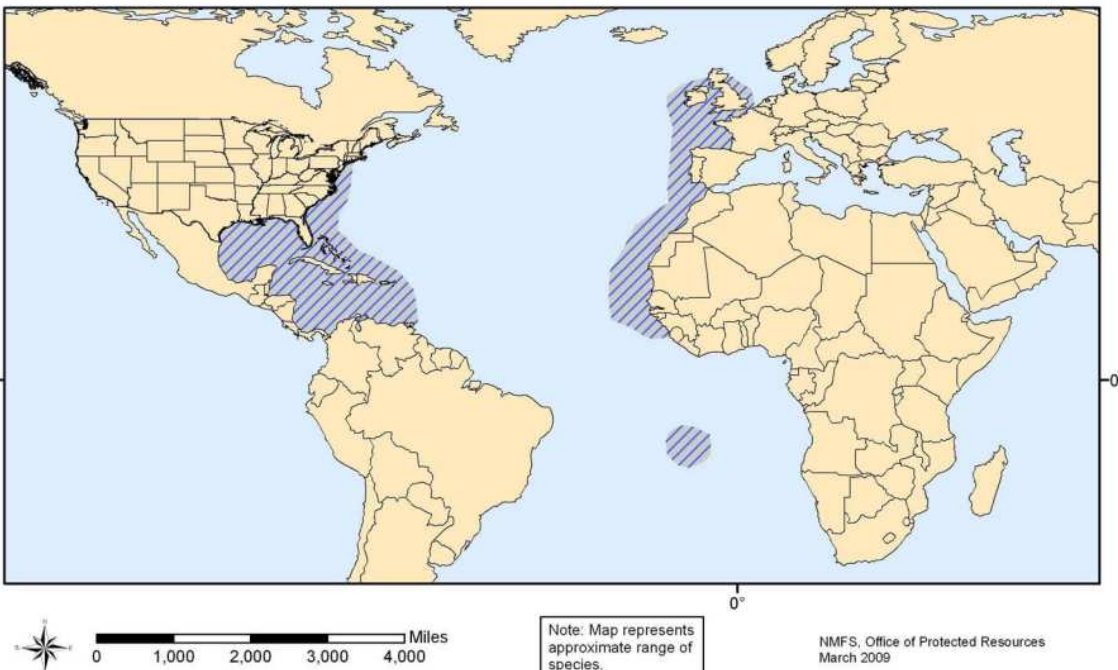


*Mesoplodon europaeus* © Wurtz-Artescienza



© NMFS Southeast Fisheries Science Center

## Gervais' Beaked Whale Range



L max: ♀ 4,5m , ♂ 5,2m  
L nascita: 2m



# Cogia di Owen (*Kogia sima*)

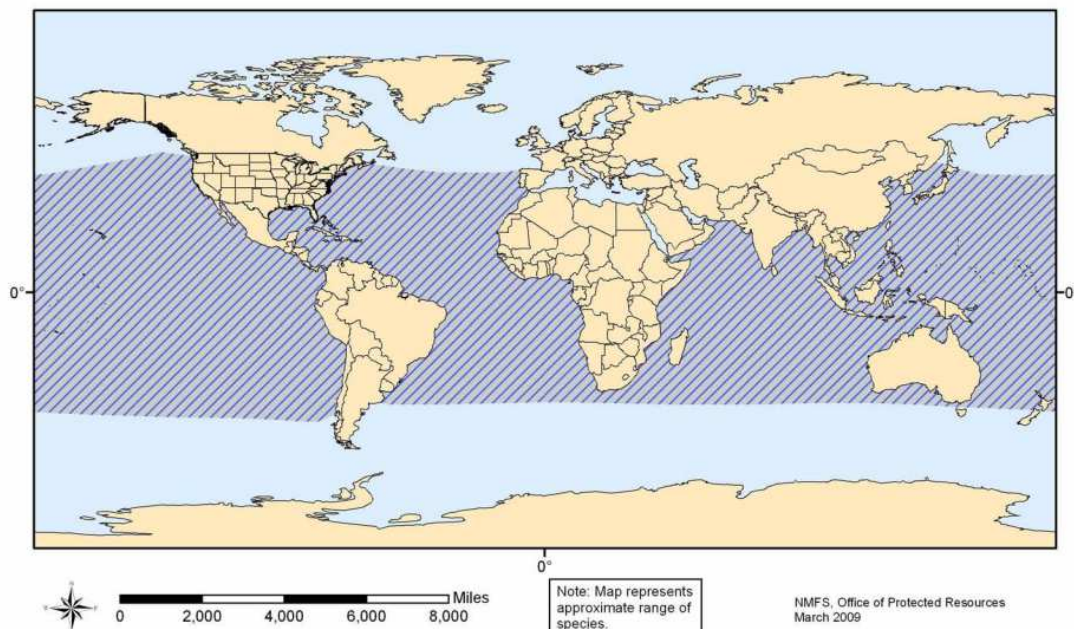


*Kogia sima* © Würtz-Artescienza



© Tim Stenton

Dwarf Sperm Whale Range



**L max: 2,7m**

**L nascita: 1m**

**Denti: 16-26 nella mandibola**



# Focena (*Phocoena phocoena*)

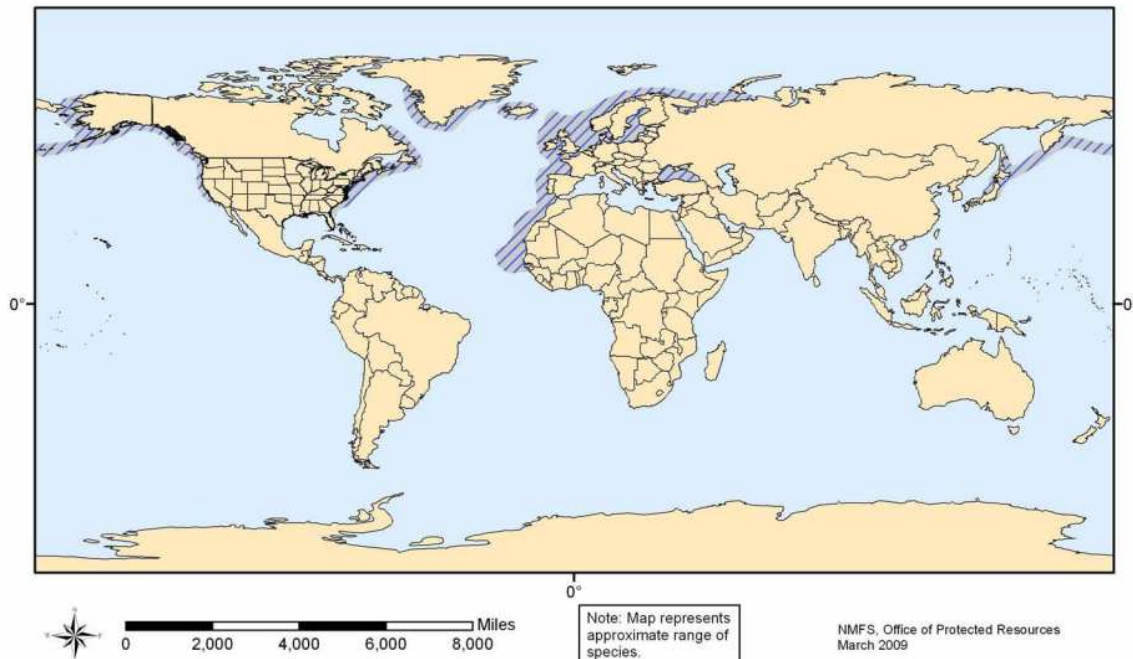


*Phocoena phocoena* © Wurtz-Artescienza

**Denti: 38-56 per mascella**



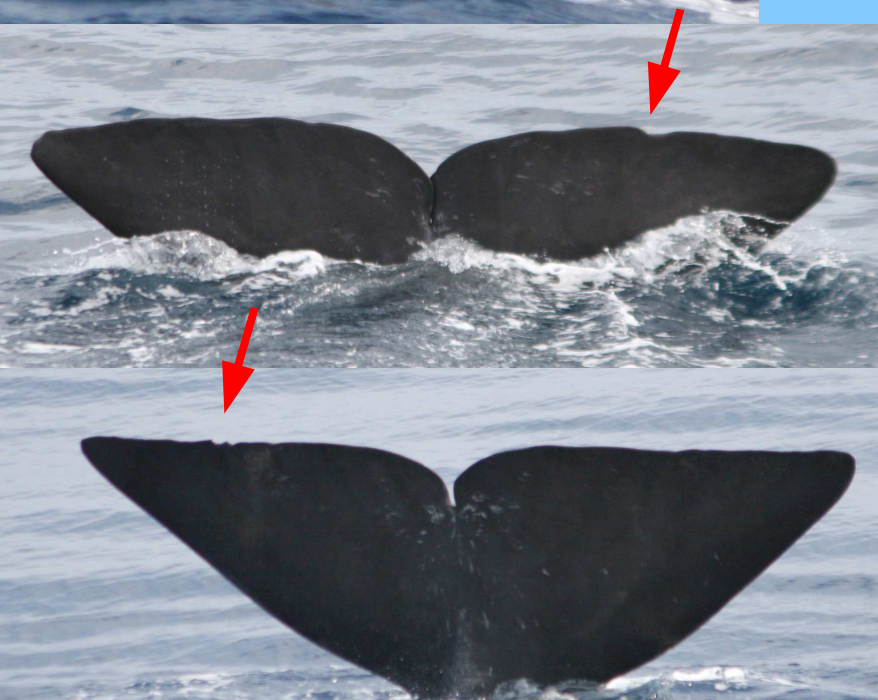
Harbor Porpoise Range



**L max: ♀ 2,1m , ♂ 2,3m**  
**L nascita: 1m**



# Fotoidentificazione





# Fotoidentificazione: il caso dello Zifio nel Mar Ligure (I)





# Fotoidentificazione: il caso dello Zifio nel Mar Ligure (II)

## Utilità della photoID su esemplari spiaggiati



Zc spiaggiato a Ceriale (SV), 19/02/2009

Ziphius code 050619LR02  
Ziphius name animal 2  
Animal size adult  
Animal sex Possible male  
Animal colour Cream colored and heavily scarred.  
Dorsal fin two notches  
Distinctiveness ratio Very distinctive  
Date 19/06/2005  
Julian Day 170  
Time 11.12.00  
Ziphius group A  
Zc old code MATCH 18 with 050619LR02  
Latitude 43.93244N  
Longitude 8.58917W  
Right side Yes  
Left side Yes  
Femur MB: from 1639 to 1645, from 1702 to 1706, 1754, 1755; FG: from 164 to 177;  
Photo-quality good-fair  
Composition of the group 3 animals  
c codes of other animals 050619LR01, 050619LR03, 050619LR04  
Tag Yes  
Tag code tag group  
Name old catalog /  
Notes FIND TAG CODE ON CD



**Match con l'identificativo 050619LR02**  
**(WHOI photoID catalog)**, fotoidentificato in  
Mar Ligure il 19 Giugno 2005 e rifotografato  
il 21 Giugno



A photograph of two dolphins swimming in deep blue water. The dolphin in the foreground is in profile, facing right, with its dorsal fin visible. A second dolphin is swimming below it, slightly out of focus. The text "...Grazie a tutti per l'attenzione!!" is overlaid in white on the right side of the image.

**...Grazie a tutti per l'attenzione!!**