

# Costa Rica

## Progress report on Cetacean Research

### January 1999 to February 2012

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This report summarises information obtained from:

Name of agency/institute	Abbreviation (use in rest of report)	Contact e-mail address
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Asociacion V.I.D.A.	AVIDA	<a href="mailto:frankgarita@gmail.com">frankgarita@gmail.com</a> <a href="mailto:vida@vida.org">vida@vida.org</a>
Fundación Keto	Keto	<a href="mailto:info@fundacionketo.org">info@fundacionketo.org</a> José David Palacios-Alfaro <a href="mailto:dpalacios@fundacionketo.org">dpalacios@fundacionketo.org</a> Gabriela Hernández Mora <a href="mailto:gbernandez@fundacionketo.org">gbernandez@fundacionketo.org</a>
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#### 1. SPECIES AND STOCKS STUDIED

A tabular format is most appropriate. Please indicate where in the report the species is mentioned and use IWC recommended names (see IWC, 2006, Annex L).

KETO			
IWC common name	IWC recommended scientific name	Area/stock(s)	Items referred to
Bryde's whale	<i>Balaenoptera edeni</i>	Pacific coast, Costa Rica	2.1.2, 3.1.1
Humpback whale	<i>Megaptera novaeangliae</i>	Pacific coast, Costa Rica	2.1.1, 2.1.2, 3.1.1, 4.3, 8
Sperm whale	<i>Physeter macrocephalus</i>	Caribbean Costa Rica	4.3, 8
Killer whale	<i>Orcinus orca</i>	Pacific coast, Costa Rica	2.1.1, 2.1.2,
False killer whale	<i>Pseudorca crassidens</i>	Pacific coast, Costa Rica	2.1.1, 2.1.2, 3.1.1, 4.3, 8
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	Pacific coast, Costa Rica	2.1.2
Common bottlenose dolphin	<i>Tursiops truncatus</i>	Pacific coast, Costa Rica	2.1.1, 2.1.2, 3.1.1, 4.3, 8
Pantropical spotted dolphin	<i>Stenella attenuata</i>	Pacific coast, Costa Rica	2.1.1, 2.1.2, 3.1.1, 4.3, 8
Spinner dolphin	<i>Stenella longirostris</i>	Pacific coast, Costa Rica	2.1.2, 8
Striped dolphin	<i>Stenella coeruleoalba</i>	Pacific coast, Costa Rica	4.3, 8

Short-beaked common dolphin	<i>Delphinus delphis</i>	Pacific coast, Costa Rica	2.1.1
Rough-tooth dolphin	<i>Steno bredanensis</i>	Pacific coast, Costa Rica	2.1.1, 2.1.2, 3.1.1, 8
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	Pacific coast, Costa Rica	4.3, 8
Dwarf sperm whale	<i>Kogia sima</i>	Pacific coast and south Caribbean, Costa Rica	4.3, 8
<b>PROMAR</b>			
Blue whale	<i>Balaenoptera musculus</i>	CR Dome	8; 9
Fin whale	<i>Balaenoptera physalus</i>	North Caribbean	8
Sei whale	<i>Balaenoptera borealis</i>	North Pacific; off Coco's Island	8
Bryde's whale	<i>Balaenoptera edeni</i>	Central and South Pacific	8; 9
Humpback whale	<i>Megaptera novaeangliae</i>	All the Pacific Coast	8
Sperm whale	<i>Physeter macrocephalus</i>	All Pacific Coast	8; 9
Dwarf sperm whale	<i>Kogia sima</i>	North Pacific	8
Longman's beaked whale	<i>Indopacetus pacificus</i>	South Pacific	9
Blainville's beaked whale	<i>Mesoplodon densirostris</i>	South Pacific	9
Pygmy beaked whale	<i>Mesoplodon peruvianus</i>	South Pacific	9
Unidentified beaked whale	<i>Mesoplodon sp.</i>	Off Southern Coco's Island	9
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	North & South Pacific; N Carib.	8
False orca	<i>Pseudorca crassidens</i>	North & South Pacific; N Carib.	9
Orca	<i>Orcinus orca</i>	Central and South Pacific; S Carib.	8
Bottlenose dolphin	<i>Tursiops truncatus</i>	All EEZ	4.1; 8; 9
Tucuxi dolphin	<i>Sotalia guianensis</i>	South Caribbean	8
Rough-toothed dolphin	<i>Steno bredanensis</i>	North Pacific	8
Common dolphin	<i>Delphinus delphis</i>	All Pacific	8; 9
Spinner dolphin	<i>Stenella longirostris</i>	All Pacific EEZ	8; 9
Pantropical spotted dolphin	<i>Stenella attenuata</i>	All Pacific EEZ	4.1; 8; 9
Striped dolphin	<i>Stenella coeruleoalba</i>	All Pacific	8; 9
Fraser's dolphin	<i>Lagenodelphis hosei</i>	Central Pacific	8
<b>AVIDA</b>			
Bryde's whale	<i>Balaenoptera edeni</i>	Pacific coast, Costa Rica and Panama	2.1.1, 2.1.2, 3.1.1
Humpback whale	<i>Megaptera novaeangliae</i>	Pacific coast, Costa Rica and Nicaragua	2.1.1, 2.1.2, 3.1.1, 9

Killer whale	<i>Orcinus orca</i>	Pacific coast, Costa Rica	2.1.1, 2.1.2,3.1.1
False killer whale	<i>Pseudorca crassidens</i>	Pacific coast, Costa Rica, Nicaragua and Panama	2.1.1, 2.1.2, 3.1.1,4.3, 8
Pantropical spotted dolphin	<i>Stenella attenuate</i>	Pacific coast, Costa Rica	2.1.1, 2.1.2, 3.1.1
Rough-tooth dolphin	<i>Steno bredanensis</i>	Pacific coast, Costa Rica	2.1.1, 2.1.2, 3.1.1
Bottlenose dolphin	<i>Tursiops truncates</i>	Pacific coast, Costa Rica	2.1.1,2.1.2,3.1.1

## 2. SIGHTINGS DATA

### 2.1 Field work

#### 2.1.1 Systematic

#### KETO

Studies on cetacean diversity were carried out from a vessel to study the use of habitat, photo-id, behavior at Isla del Caño in Puntarenas Province and Bahía Santa Elena in Guanacaste Province, Costa Rica during May 2005 to April 2006.

Target species	Date	Area	No. of sightings	Contact person/institute and references
Pantropical spotted dolphin	May 2005- April 2006	Isla del Caño	89	<a href="mailto:info@fundacionketo.org">info@fundacionketo.org</a>
		Bahía Santa Elena	23	Martínez et al. 2011
Humpback whale	May 2005- April 2006	Isla del Caño	12	<a href="mailto:info@fundacionketo.org">info@fundacionketo.org</a>
		Bahía Santa Elena	10	Martínez et al. 2011
Common bottlenose dolphin	May 2005- April 2006	Isla del Caño	14	<a href="mailto:info@fundacionketo.org">info@fundacionketo.org</a>
		Bahía Santa Elena	3	Martínez et al. 2011
False killer whale	May 2005- April 2006	Isla del Caño	7	<a href="mailto:info@fundacionketo.org">info@fundacionketo.org</a> Martínez et al. 2011
Killer whale	May 2005- April 2006	Bahía Santa Elena	3	<a href="mailto:info@fundacionketo.org">info@fundacionketo.org</a> Martínez et al. 2011
Rough-tooth dolphin	May 2005- April 2006	Isla del Caño	2	<a href="mailto:info@fundacionketo.org">info@fundacionketo.org</a> Martínez et al. 2011
Short-beaked common dolphin	May 2005- April 2006	Isla del Caño	1	<a href="mailto:info@fundacionketo.org">info@fundacionketo.org</a> Martínez et al. 2011

#### AVIDA

**The studies were done using different vessels, to take data on behavior, distribution and photo-identification; most of the study was conducted on humpback whales since 2002 in southern Costa Rica, Drake Bay, Caño Island and Ballena National Park, in the province of Puntarenas**

Humpback Whale	2002-2010	Ballena National Park, Isla del Caño	170	<a href="mailto:frankgarita@gmail.com">frankgarita@gmail.com</a> / <a href="mailto:vida@vida.org">vida@vida.org</a> Rassmusen et al. 2007 Acevedo et al. 2008 Felix et al.2008
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False Killer Whale	2008-2010	Ballena National Park, isla del Caño	90	<a href="mailto:frankgarita@gmail.com">frankgarita@gmail.com</a> / <a href="mailto:vida@vida.org">vida@vida.org</a> , Douglas et al. 2010
Killer Whale	2008-2010	Isla del Caño, Playas del Coco	5	<a href="mailto:frankgarita@gmail.com">frankgarita@gmail.com</a> / <a href="mailto:vida@vida.org">vida@vida.org</a> , Martinez & Garita 2006
Common bottlenose dolphin	2006-2010	Ballena National Park, isla del Caño	10	<a href="mailto:frankgarita@gmail.com">frankgarita@gmail.com</a> / <a href="mailto:vida@vida.org">vida@vida.org</a> ,
Rough-tooth dolphin	2006-2010	Ballena National Park, isla del Caño	6	<a href="mailto:frankgarita@gmail.com">frankgarita@gmail.com</a> <a href="mailto:vida@vida.org">vida@vida.org</a> ,
Bryde's whale	2008-2010	Ballena National Park,	3	<a href="mailto:frankgarita@gmail.com">frankgarita@gmail.com</a> / <a href="mailto:vida@vida.org">vida@vida.org</a> ,
Pantropical spotted dolphin	2002-2010	Ballena National Park, Isla del Caño	92	<a href="mailto:frankgarita@gmail.com">frankgarita@gmail.com</a> / <a href="mailto:vida@vida.org">vida@vida.org</a> ,

### 2.1.2 Opportunistic, platforms of opportunity

#### KETO

Primary species	Area	Data type/method	Collected by	Platform	Location of archive (if applicable)	Contact person/institute and refs
Bryde's whale	Bahia Coronado	Animal behaviour, photo-ID, sightings	Dedicated Observers, crew	whalewatching vessel	Keto	José David Palacios-Alfaro/Keto
Humpback whale	Bahia Coronado	Animal behaviour, photo-ID, sightings	Dedicated Observers, crew	whalewatching vessel	Keto	José David Palacios-Alfaro/Keto
Killer whale	Bahia Coronado	Animal behaviour, photo-ID, sightings	Dedicated Observers, crew	whalewatching vessel	Keto	José David Palacios-Alfaro/Keto
False killer whale	Bahia Coronado	Animal behaviour, photo-ID, sightings	Dedicated Observers, crew	whalewatching vessel	Keto	José David Palacios-Alfaro/Keto
Short-finned pilot whale	Pacific coast	Photo-ID	Dedicated Observers, crew	whalewatching vessel	Keto	José David Palacios-Alfaro/Keto
Common bottlenose dolphin	Bahia Coronado	Animal behaviour, photo-ID, sightings	Dedicated Observers, crew	whalewatching vessel	Keto	José David Palacios-Alfaro/Keto
Pantropical spotted dolphin	Bahia Coronado	Animal behaviour, photo-ID, sightings	Dedicated Observers, crew	whalewatching vessel	Keto	José David Palacios-Alfaro/Keto
Rough-tooth dolphin	Bahia Coronado	Animal behaviour, photo-ID, sightings	Dedicated Observers, crew	whalewatching vessel	Keto	José David Palacios-Alfaro/Keto

Spinner dolphin	Bahia Coronado	Animal behaviour, photo-ID, sightings	Dedicated Observers, crew	whalewatching vessel	Keto	José David Palacios-Alfaro/Keto
AVIDA						
Humpback Whale	Ballena National Park, Bahia Drake	Animal behavior, photo-ID, sightings, song recording Temp.	Crew and Observers	Whale watching vessel	AVIDA	Frank Garita / AVIDA
Bryde's whale	Ballena National Park	Animal behaviour, photo-ID, sightings	Crew and Observers	Whale watching vessel	AVIDA	Frank Garita / AVIDA
Common bottlenose dolphin	Ballena National Park, Bahia Drake	Animal behaviour, photo-ID, sightings	Crew and Observers	Whale watching vessel	AVIDA	Frank Garita / AVIDA
Pantropical spotted dolphin	Ballena National Park, Bahia Drake	Animal behaviour, photo-ID, sightings	Crew and Observers	Whale watching vessel	AVIDA	Frank Garita / AVIDA
Killer whale	Isla del Caño, Playasdel Coco	Animal behaviour, photo-ID, sightings	Crew and Observers	Whale watching vessel	AVIDA	Frank Garita/ AVIDA
False killer whale	Ballena National Park, Bahia Drake	Animal behaviour, photo-ID, sightings	Crew and Observers	Whale watching vessel	AVIDA	Frank Garita/ AVIDA
Rough-tooth dolphin	Ballena National Park	Animal behaviour, photo-ID, sightings	Crew and Observers	Whale watching vessel	AVIDA	Frank Garita / AVIDA

### 3. MARKING DATA

#### 3.1 Field work

##### 3.1.1 Natural marking data

KETO						
Species	Feature	Area/stock	No. photo-id'd	Catalogue (Y/N)	Catalogue total	Contact person/institute; refs
Humpback whale	Fluke	Pacific coast, Costa Rica	40	Y	40	José David Palacios-Alfaro/Keto
Humpback whale	Dorsal fin	Pacific coast, Costa Rica	73	Y	73	José David Palacios-Alfaro/Keto
Bryde's whale	Dorsal fin	Pacific coast, Costa Rica	5	Y	5	José David Palacios-Alfaro/Keto

False killer whale	Dorsal fin	Pacific coast, Costa Rica	70	Y	70	José David Palacios-Alfaro/Keto
Common bottlenose dolphin	Dorsal fin	Pacific coast, Costa Rica	N/A	Y	N/A	José David Palacios-Alfaro/Keto
Rough-tooth dolphin	Dorsal fin	Pacific coast, Costa Rica	40	Y	40	José David Palacios-Alfaro/Keto
Guiana dolphin	Dorsal fin	South Caribbean, Costa Rica	64	Y	64	Monica Gamboa <a href="mailto:orcinus_551205@hotmail.com">orcinus_551205@hotmail.com</a> Gamboa-Poveda and May-Collado 2006. SC/58/SM4
Common bottlenose dolphin	Dorsal fin	South Caribbean, Costa Rica	82	Y	82	Monica Gamboa <a href="mailto:orcinus_551205@hotmail.com">orcinus_551205@hotmail.com</a> Gamboa-Poveda and May-Collado 2006. SC/58/SM4
AVIDA						
Humpback Whale	Fluke	Pacific coast, Costa Rica, Panama, Nicaragua	N/A	Y		Frank Garita AVIDA
Humpback whale	Dorsal fin	Pacific coast, Costa Rica, Panamá and Nicaragua	N/A	Y		Frank Garita AVIDA
Bryde's whale	Dorsal fin	Pacific coast, Costa Rica, and Panama	N/A	Y		Frank Garita AVIDA
Common bottlenose dolphin	Dorsal fin	Pacific coast, Costa Rica	N/A	Y		Frank Garita AVIDA
Rough-tooth dolphin	Dorsal fin	Pacific coast, Costa Rica	N/A	Y		Frank Garita AVIDA
False killer whale	Dorsal fin	Pacific coast, Costa Rica, Nicaragua	N/A	Y		Frank Garita AVIDA
Pantropical spotted dolphin	Dorsal fin	Pacific coast, Costa Rica, Nicaragua	N/A	Y		Frank Garita AVIDA
Killer whale	Dorsal fin	Pacific coast, Costa Rica	N/A	Y		Frank Garita AVIDA

#### 4. TISSUE/BIOLOGICAL SAMPLES COLLECTED

##### 4.1 Biopsy samples (summary only)

Species	Area/stock	Calendar year/ season - no. collected	Archived (Y/N)	No. analysed	Total holdings	Contact person/institute
Bottlenose dolphin	Golfo Dulce, South Pacific	2000/2	N	2	-	JRF/Promar

Spotted dolphin	Golfo Dulce, South Pacific	2000/2	N	2	-	JRF/Promar
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#### 4.3 Samples from stranded animals

Species	Area/stock	Tissue type(s)*	No. collected	Archived (Y/N)	No. analysed	Contact person/institute
Sperm whale	Caribbean Costa Rica	Blubber, lung, heart, liver, reproductive organs, skin, spleen, teeth.	2	Y	0	Gabriela Hernandez/ SENASA/Keto <a href="mailto:gabbytica@gmail.com">gabbytica@gmail.com</a> <a href="http://ghernandez@fundacionketo.org">ghernandez@fundacionketo.org</a>
Cuvier's beaked whale	Pacific coast, Costa Rica	Blubber, lung, heart, liver, reproductive organs, skin, spleen, teeth, brain	2		0	Gabriela Hernandez/SENASA/Keto <a href="mailto:gabbytica@gmail.com">gabbytica@gmail.com</a> <a href="http://ghernandez@fundacionketo.org">ghernandez@fundacionketo.org</a>
Common bottlenose dolphin	Pacific coast, Costa Rica	Blubber, lung, heart, liver, reproductive organs, skin, spleen, teeth, brain	3	Y	0	Gabriela Hernandez/SENASA/Keto <a href="mailto:gabbytica@gmail.com">gabbytica@gmail.com</a> <a href="http://ghernandez@fundacionketo.org">ghernandez@fundacionketo.org</a>
Striped dolphin	Pacific coast, Costa Rica	Blubber, lung, heart, liver, reproductive organs, skin, spleen, teeth, brain	26	Y	26	Gabriela Hernandez/SENASA/Keto <a href="mailto:gabbytica@gmail.com">gabbytica@gmail.com</a> <a href="http://ghernandez@fundacionketo.org">ghernandez@fundacionketo.org</a>
Pantropical spotted dolphin	Pacific coast, Costa Rica	Blubber, lung, heart, liver, reproductive organs, skin, spleen, teeth, brain	1		1	Gabriela Hernandez/SENASA/Keto <a href="mailto:gabbytica@gmail.com">gabbytica@gmail.com</a> <a href="http://ghernandez@fundacionketo.org">ghernandez@fundacionketo.org</a>
Dwarf sperm whale	Pacific coast, Costa Rica	Blubber, lung, heart, liver, reproductive organs, skin, spleen, teeth, brain	3	Y	3	Gabriela Hernandez/SENASA/Keto <a href="mailto:gabbytica@gmail.com">gabbytica@gmail.com</a> <a href="http://ghernandez@fundacionketo.org">ghernandez@fundacionketo.org</a>
False killer whale	Pacific coast, Costa Rica	Teeth	1	Y	0	José David Palacios-Alfaro/Keto
False killer whale	Bahia Drake, Costa Rica	Teeth, blubber and skin	1	Y	0	Frank Garita –AVIDA Cascadia Research Colleteive

\*e.g. liver, skin, blubber etc.

#### 4.4 Analyses/development of techniques

Due to the lack worldwide, of diagnostic tests for brucellosis in cetaceans and the prevalence of brucellosis in the stranded striped dolphin (*S. coerulealba*) in the Pacific coast of Costa Rica (CR), an indirect ELISA (Enzyme-Linked ImmunoSorbent Assay) was developed and validated in CR, with samples from captive and stranded cetaceans from United States and stranded cetaceans from Spain and Costa Rica (Hernández-Mora et al., 2009). This test for odontocetes has a better sensitivity and specificity of the ones developed and standardized for terrestrial animals.

### 5. POLLUTION STUDIES

The analysis of blubber samples summarized in Section 4 indicated the presence of both organochlorines and PCB's in both species of dolphins (one female and one male in each species). In the case of the bottlenose

dolphin the levels found were similar to those in South Africa and Australia. For the spotted dolphin (*Stenella attenuata*), up to authors knowledge, this is the first report on the presence of this contaminants for the species (Cubero-Pardo et al. 2002).

## 7. STATISTICS FOR SMALL CETACEANS

### 7.1 Corrections to earlier years' statistics for small cetaceans

This would be a place to include any corrections to statistics presented in earlier years. It may also be appropriate to include references to studies that utilise time series of data here.

### 7.3 Anthropogenic mortality of small cetaceans for the calendar year 2000 to 2012

#### 7.3.1 Observed or reported ship strikes of small cetaceans (including non fatal events)

Species	Sex	No.	Date	Location	Vessel type	Speed	Fate	How observed	Contact person/ institute and refs
Short-finned pilot whale	U	1	03/02/12	Salsipuedes Beach, Osa Península, South Pacific	-	-	D*	Post mortem	JRF/Promar
*Partially cut at the back near the tail peduncle.									

#### 7.3.2 Fishery bycatch of small cetaceans

Species	Ratio of male to female (if known)	No.	No. extrapolated to fleet total (point estimate)	Range, CI or CV	Date of bycatch	Location (description or lat/long)	FAO statistical area (if known)	FAO area	Fate	Targeted species	Gear	How observed?	Source or contact
Striped dolphin	-	1	-	-	10/10/00	Damas I., Quepos, Central Pacific	-	-	D	-	*	F	JRF/Promar
Striped dolphin	-	1	-	-	14/12/03	Sirena Beach, Osa Peninsula, South Pacific	-	-	D	-	**	F	JRF/Promar
Bottlenose dolphin	-	1	--		11/09/05	Dominical Beach, Central Pacific	-	-	D	-	(shot gun)	F	JRF/Promar
Comments: *The dolphin showed two clear long knife cuts on the right side, but it cannot be determined if it was attacked on the sea or while stranded. ** A decapitated individual, not clear if in the sea or while stranded.													

## 8. STRANDINGS

Give a paragraph detailing the nature of the strandings reporting process (e.g. completely opportunistic, one or more networks, coastline covered, seasonal coverage). Then complete the following summary table with information where people can go for more details.

### KETO

Also the Keto since 2007 developed the Marine Rescue Program (MRP) through which the inhabitants of the coast, beach tourist, police, hotels, Coast Guard, 911, firefighters, National Service of Animal Health personnel reports the stranded animals directly to the program through the year. The MRP, furthermore works in collaboration with the Investigation Program of Tropical Diseases (P.I.E.T), Pathology, Bacteriology Department and other laboratories of the Veterinary Medicine Faculty of the National University and the National Service of Animal Health (SENASA).



## PROMAR

Javier Rodriguez data comes from the Costa Rican Marine Mammals Rescue Network (RECORMA by its Spanish acronyms)/Promar. The results correspond to the period of 1999-2008 (Cubero-Pardo & Rodríguez-Fonseca 1999-2008). The 16 species that have at least one stranding registered represents more than half (57.1%) of the 28 species known for the country (Rodríguez-Fonseca 2001, May-Collado *et al.* 2005).

In relation to the Cetacean strandings summarized in Section 8, it should be highlighted the following:

a) Historically, there are additional registered strandings of great whales: one blue whale (1985), one Sei whale (1987) and one humpback whale (1983, a calf). Also, 8 strandings of single sperm whales are documented (Rodríguez-Fonseca & Cubero-Pardo 2001).

b) Of the 6 strandings of humpback whales in the period of analysis (1999-2008), 5 were of calves (all single ones), which is a matter of great concern. Unfortunately no clear cause of death was determined in any case (including the single adult), though ship strikes, ocean noise and unmanaged whale watching activities must be considered in the near future (May-Collado 2006, Rodríguez-Fonseca 2007).

c) The Sei whale stranding must be considered as an unexpected one in the ETP (R. Pitman, SWFSC/NOAA, *pers. comm.* 2011).

d) The striped dolphin is the most frequent species that stranded singly in the Pacific coast of the country during the last seven years, due to marine brucellosis. This disease is caused by *Brucella ceti*, bacteria that infects reproductive organs and also central nervous system causing meningoencephalomyelitis (Hernández-Mora *et al.*, 2008, González-Barrientos *et al.*, 2010). Other species like *Stenella attenuata* and *Tursiops truncatus* were also serologically positive but this individuals do not developed the pathologies like their counterparts *S. coeruleoalba*.

e) Three particular strandings of these period will be submitted for publication (Sei whale, rough-toothed dolphin and Fraser's dolphin) (Rodríguez-Fonseca *et al.* In prep.).

The strandings attended by FKeto 2004-2012, where completely opportunistic and the attention does not have seasonal coverage attending all the reports throughout the year

Species	No. strandings	No. post mortems	Contact person(s)/ Institute(s)	Contact email address(es)
KETO				
Humpback whale	4	1	Gabriela Hernandez- SENASA-Keto Jose David Palacios/Keto	<a href="mailto:gbernandez@fundacionketo.org">gbernandez@fundacionketo.org</a> / <a href="mailto:gabbytica@gmail.com">gabbytica@gmail.com</a> <a href="mailto:dpalacios@fundacionketo.org">dpalacios@fundacionketo.org</a>
Sperm whale	2	2	Gabriela Hernandez- SENASA-Keto Jose David Palacios/Keto	<a href="mailto:gbernandez@fundacionketo.org">gbernandez@fundacionketo.org</a> / <a href="mailto:gabbytica@gmail.com">gabbytica@gmail.com</a> <a href="mailto:dpalacios@fundacionketo.org">dpalacios@fundacionketo.org</a>
False killer whale	2	0	Gabriela Hernandez- SENASA-Keto Jose David Palacios/Keto	<a href="mailto:gbernandez@fundacionketo.org">gbernandez@fundacionketo.org</a> / <a href="mailto:gabbytica@gmail.com">gabbytica@gmail.com</a> <a href="mailto:dpalacios@fundacionketo.org">dpalacios@fundacionketo.org</a>
Common bottlenose dolphin	7	2	Gabriela Hernandez- SENASA-Keto Jose David Palacios/Keto	<a href="mailto:gbernandez@fundacionketo.org">gbernandez@fundacionketo.org</a> / <a href="mailto:gabbytica@gmail.com">gabbytica@gmail.com</a> <a href="mailto:dpalacios@fundacionketo.org">dpalacios@fundacionketo.org</a>
Pantropical spotted dolphin	1	1	Gabriela Hernandez- SENASA-Keto Jose David Palacios/Keto	<a href="mailto:gbernandez@fundacionketo.org">gbernandez@fundacionketo.org</a> / <a href="mailto:gabbytica@gmail.com">gabbytica@gmail.com</a> <a href="mailto:dpalacios@fundacionketo.org">dpalacios@fundacionketo.org</a>
Striped dolphin	29	25	Gabriela Hernandez- SENASA-F Keto Jose David Palacios F Keto	<a href="mailto:gbernandez@fundacionketo.org">gbernandez@fundacionketo.org</a> / <a href="mailto:gabbytica@gmail.com">gabbytica@gmail.com</a> <a href="mailto:dpalacios@fundacionketo.org">dpalacios@fundacionketo.org</a>
Spinner dolphin	1	0	Gabriela Hernandez- SENASA-Keto Jose David Palacios/Keto	<a href="mailto:gbernandez@fundacionketo.org">gbernandez@fundacionketo.org</a> / <a href="mailto:gabbytica@gmail.com">gabbytica@gmail.com</a> <a href="mailto:dpalacios@fundacionketo.org">dpalacios@fundacionketo.org</a>

Rough-tooth dolphin	2	0	Gabriela Hernandez- SENASA-Keto Jose David Palacios/Keto	<a href="mailto:gbernandez@fundacionketo.org">gbernandez@fundacionketo.org/</a> <a href="mailto:gabbytica@gmail.com">gabbytica@gmail.com</a> <a href="mailto:dpalacios@fundacionketo.org">dpalacios@fundacionketo.org</a>
Cuvier's beaked whale	3	2	Gabriela Hernandez- SENASA-Keto Jose David Palacios/Keto	<a href="mailto:gbernandez@fundacionketo.org">gbernandez@fundacionketo.org/</a> <a href="mailto:gabbytica@gmail.com">gabbytica@gmail.com</a> <a href="mailto:dpalacios@fundacionketo.org">dpalacios@fundacionketo.org</a>
Dwarf sperm whale	3	3	Gabriela Hernandez- SENASA-Keto Jose David Palacios/Keto	<a href="mailto:gbernandez@fundacionketo.org">gbernandez@fundacionketo.org/</a> <a href="mailto:gabbytica@gmail.com">gabbytica@gmail.com</a> <a href="mailto:dpalacios@fundacionketo.org">dpalacios@fundacionketo.org</a>
PROMAR				
Fin whale	1	-	Javier Rodríguez-Fonseca/Promar	<a href="mailto:jrodriguez@fundacionpromar.org">jrodriguez@fundacionpromar.org</a>
Sei whale	1	-	Javier Rodríguez-Fonseca/Promar	<a href="mailto:jrodriguez@fundacionpromar.org">jrodriguez@fundacionpromar.org</a>
Bryde's whale	2	-	Javier Rodríguez-Fonseca/Promar	<a href="mailto:jrodriguez@fundacionpromar.org">jrodriguez@fundacionpromar.org</a>
Humpback whale	6	-	Javier Rodríguez-Fonseca/Promar	<a href="mailto:jrodriguez@fundacionpromar.org">jrodriguez@fundacionpromar.org</a>
Sperm whale	2	-	Javier Rodríguez-Fonseca/Promar	<a href="mailto:jrodriguez@fundacionpromar.org">jrodriguez@fundacionpromar.org</a>
Dwarf sperm whale	2	-	Javier Rodríguez-Fonseca/Promar	<a href="mailto:jrodriguez@fundacionpromar.org">jrodriguez@fundacionpromar.org</a>
Short-finned pilot whale	2	-	Javier Rodríguez-Fonseca/Promar	<a href="mailto:jrodriguez@fundacionpromar.org">jrodriguez@fundacionpromar.org</a>
Orca	2	-	Javier Rodríguez-Fonseca/Promar	<a href="mailto:jrodriguez@fundacionpromar.org">jrodriguez@fundacionpromar.org</a>
Bottlenose dolphin	5	-	Javier Rodríguez-Fonseca/Promar	<a href="mailto:jrodriguez@fundacionpromar.org">jrodriguez@fundacionpromar.org</a>
Tucuxi dolphin	1	-	Javier Rodríguez-Fonseca/Promar	<a href="mailto:jrodriguez@fundacionpromar.org">jrodriguez@fundacionpromar.org</a>
Rough-toothed dolphin	1	2	Javier Rodríguez-Fonseca/Promar	<a href="mailto:jrodriguez@fundacionpromar.org">jrodriguez@fundacionpromar.org</a>
Common dolphin	1	Released	Javier Rodríguez-Fonseca/Promar	<a href="mailto:jrodriguez@fundacionpromar.org">jrodriguez@fundacionpromar.org</a>
Spinner dolphin	1	-	Javier Rodríguez-Fonseca/Promar	<a href="mailto:jrodriguez@fundacionpromar.org">jrodriguez@fundacionpromar.org</a>
Spotted dolphin	5	2	Javier Rodríguez-Fonseca/Promar	<a href="mailto:jrodriguez@fundacionpromar.org">jrodriguez@fundacionpromar.org</a>
Striped dolphin	24	8	Javier Rodríguez-Fonseca/Promar	<a href="mailto:jrodriguez@fundacionpromar.org">jrodriguez@fundacionpromar.org</a>
Fraser's dolphin	3	-	Javier Rodríguez-Fonseca/Promar	<a href="mailto:jrodriguez@fundacionpromar.org">jrodriguez@fundacionpromar.org</a>
AVIDA				
False killer whale	1	1	Frank Garita-AVIDA	<a href="mailto:frankgarita@gmail.com">frankgarita@gmail.com</a>

## 9. OTHER STUDIES AND ANALYSES

### 1. Population estimates

There are current population estimates for 13 species in the country's EEZ of which 4 of them are pertinent here.

**Blue whale:** 27 individuals (Gerrodette & Palacios 1996)

**Bryde's whale:** 164 individuals (Gerrodette & Palacios 1996)

**Humpback whale:** The Pacific Coast of Costa Rica and Panamá are the only area in the world where humpback whale populations from both hemispheres share the same breeding grounds. Annually some 80 whales from the north-eastern feeding grounds come to Costa Rican waters (Rasmussen *et al.*, 2011) while some 200 whales come from Antarctic Peninsula and southern Chile (Rasmussen *et al.* 2007, F. Garita, Cascadia Research Collective/Asociación Ambiental Vida, *pers. comm.*2009).

**Sperm whale:** 1,286 individuals (Gerrodette & Palacios 1996).

### **3. Whale watching** (Rodríguez-Fonseca & Fischel-Quirós 2007).

There is an official regulation of the Ministry of Environment, Energy and Telecommunications for whale watching, as well there are periodic training workshops (AVIDA, Keto, and Promar Foundations) for local operators, captains and guides about regulations. Additionally, Promar has begun to improve training workshops for governmental officers about the proper interpretation and field application of the regulations. AVIDA recently (Garita Alpízar 2011) published an informative brochure for whale watching activities. This brochure includes pictures of the most common species found along the Pacific Coast of Costa Rica, and pictures and descriptions of the behaviour of humpback whales.

Despite the fast spreading of this industry across the Pacific Coast (in a much lower rate in the Caribbean) it has consolidated in at least 10 coastal communities and it is directly generating \$5.3 millions. On the other hand, the following has been identified as key species:

Bryde's whale (Southern Pacific)

Humpback whale (the whole Pacific Coast)

False orca (North & South Pacific Coast)

Tucuxi dolphin (South Caribbean Coast)

Bottlenose dolphin (the whole Caribbean & Pacific Coasts)

Spotted dolphin (the whole Pacific coast. Replaced in the Caribbean by *S. frontalis* which is a bit less coastal).

Spinner dolphin (South Pacific).

### **5. Taxonomic status and distribution**

Based on the most updated information, the taxonomic status and known sightings of Longman's, Blainville, Pygmy and unidentified/undescribed beaked whales are updated for the country (Rodríguez-Fonseca *in prep.*), which is relevant for management and protection policies towards the new focus on oceanic areas of the EEZ.

### **6. Effects of Environmental Change**

At COP 59 of the International Whaling Commission it was decided to hold a second workshop on the implications of climate change to cetaceans, at COP 60 it was decided that the Climate Change workshop would be held in Siena, Italy, end of February 2009. The Costarican government offered to host a preparatory workshop before that, in which an assessment of the status of cetaceans in the Eastern Pacific could be made along with discussion of their vulnerability to climate change and adaptation options. There is a report of the workshop called "Cetaceans and other Marine Biodiversity of the Eastern Tropical Pacific, Options for Adapting to Climate Change with outcomes of the activity.

## **10. LITERATURE CITED**

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Please follow the official IWC style guide for references (<http://www.iwcoffice.org/publications/styleguide.htm>).

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Guzmán-Verri C., R. González-Barrientos, G. Hernández-Mora, J. A. Morales, E. Baquero-Calvo, E. Chaves-Olarte, E. Moreno. 2012. *Brucella ceti* and brucellosis in cetaceans. *Front. Cell. Inf. Microbio.* 2:3. doi:10.3389/fcimb.2012.00003

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Cubero-Pardo, P., C. Ruepert, J. Rodríguez-Fonseca, P. Forestell, F. Albertazzi, M. L. Crespo-Varela, V. Montenegro-Hidalgo and P. de Voogt. 2002. First evidence of persistent organochlorines in blubber samples of dolphins from coastal Eastern Tropical Pacific. Unpublished Technical Report FP1-03. Fundación Promar, San José. 24 p.

Please list all published or 'in press' papers. **It will be appreciated if you can send a pdf or reprint to the Secretariat for the library.**

## Appendix 1. FOA fishing descriptions and codes

<b>FAO FISHING GEAR CATEGORIES:</b>		<b>FALLING GEAR</b>	
<b>SURROUNDING NETS</b>		Cast nets	FCN
With purse lines	PS	Falling gear (not specified)	FG
One-boat operated purse seines	PS1	<b>GILLNETS AND ENTANGLING GEAR</b>	
Two-boat operated purse seines	PS2	Set gillnets (anchored)	GNS
Without purse lines (lampara)	LA	Driftnets	GND
<b>SEINE NETS</b>		Encircling gillnets	GNC
Beach seines	SB	Fixed gillnets (on stakes)	GNF
Boat seines	SV	Trammel nets	GTR
Danish seines	SDN	Combined gillnet-trammel nets	GTN
Scottish seines	SSC	Gillnets and entangling gillnets (not specified)	GEN
Pair seines	SPR	Gillnets (not specified)	GN
Seine nets (not specified)	SX	<b>TRAPS</b>	
<b>TRAWLS</b>		Stationary uncovered pounds nets	FPN
Bottom trawls	TBB	Pots	FPO
Beam trawl	OTB	Fyke nets	FYK
Otter trawls (side or stern)	PTB	Stow nets	FSN
Pair trawls	TBN	Barriers, fences, weirs, etc	FWR
Nephrops trawls	TBS	Aerial traps	FAR
Shrimp trawls (not specified)	TM	Traps (not specified)	FIX
Midwater trawls		<b>HOOKS AND LINES</b>	
Otter trawls (side or stern)	OTM	Handlines and pole-lines (hand operated)	LHP
Pair trawls	PTM	Handlines and pole-lines (mechanised)	LHM
Shrimp trawls	TMS	Set longlines	LLS
Midwater trawls (not specified)	TM	Drifting longlines	LLD
Otter twin trawls	OTT		

Otter trawls (not specified)	OT	Longlines (not specified)	LL
Pair trawls (not specified)	PT	Trolling lines	LTL
Other trawls (not specified)	TX	Hooks and lines (not specified)	LX
<b>DREDGES</b>		<b>GRAPPLING AND WOUNDING</b>	
Boat dredges	DRB	Harpoons	HAR
Hand dredges	DRH	<b>HARVESTING MACHINES</b>	
<b>LIFT NETS</b>		Pumps	HMP
Portable lift nets	LPN	Mechanised dredges	HMD
Boat-operated lift nets	LNB	Harvesting machines (not specified)	HMX
Shore operated stationary lift nets	LNS	<b>MISCELLANEOUS GEAR</b>	MIS
Lift nets (not specified)	LN	<b>RECREATIONAL FISHING GEAR</b>	RG
		<b>GEAR NOT KNOWN OR NOT SPECIFIED</b>	NK
		<b>SHARK CONTROL NETS</b>	NSC
		<b>DERELICT FISHING GEAR</b>	