

**Mexico. Progress report on cetacean research, March 2009 to March 2010, with statistical data for the calendar year 2009.**

COMPILED BY PALOMA LADRÓN DE GUEVARA P.\*, LORENZO ROJAS-BRACHO\* AND JORGE URBÁN-RAMÍREZ\*\*

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This report summarises information obtained from:

Name of agency/institute	Abbreviation (use in rest of report)	Contact e-mail address
Instituto Nacional de Ecología	INE	Lorenzo Rojas-Bracho, e-mail: lrojas@cicese.mx
Instituto Politécnico Nacional, Centro Interdisciplinario de Ciencias Marinas	CICIMAR-IPN	Diane Gendron, e-mail: dgendron@ipn.mx
Instituto Tecnológico de Bahía de Banderas	ITBB	Roberto Moncada-Cooley, e-mail: itmar6_mammal@yahoo.com.mx
Programa de Investigación de Mamíferos Marinos Universidad Autónoma de B.C.S.	PRIMMA-UABCS	Jorge Urbán R., e-mail: <a href="mailto:jurban@uabcs.mx">jurban@uabcs.mx</a> Alejandro Gómez-Gallardo, e-mail: <a href="mailto:eagg@uabcs.mx">eagg@uabcs.mx</a>
Cetacean Research Associates	CRA	Steve Swartz, e-mail: <a href="mailto:Kabloona15@comcast.net">Kabloona15@comcast.net</a>

## 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). For subsequent items, common names are preferred. e.g.:

IWC common name	IWC recommended scientific	Area/stock(s)	Items referred to
Vaquita	<i>Phocoena sinus</i>	Upper Gulf of California	9
Humpback whale	<i>Megaptera novaeangliae</i>	Los Cabos, B.C.S., Banderas Bay, Nay., Gulf of California /North	2.1.1, 2.2, 3.1.1, 4.1, 8
Blue whale	<i>Balaenoptera musculus</i>	Gulf of California/North	2.1.1, 2.1.2, 3.1.1, 4.1
Fin whale	<i>Balaenoptera physalus</i>	Gulf of California/North	2.1.1, 2.1.2, 3.1.1, 4.1
Bryde's whale	<i>Balaenoptera edeni</i>	Gulf of California/North Pacific	2.1.1, 3.1.1, 4.1, 8
Minke whale	<i>Balaenoptera acutorostrata</i>	Gulf of California/North Pacific	8
Gray whale	<i>Eschrichtius robustus</i>	San Ignacio Lagoon/Eastern Pacific (wintering breeding)	2.1.1; 2.2; 3.1.1; 8
Sperm whales	<i>Physeter macrocephalus</i>	Gulf of California/North	2.1.1, 2.1.2, 3.1.1, 4.1, 8
Dwarf sperm whale	<i>Kogia sima</i>	Gulf of California/North	2.1.1, 8
Killer whale	<i>Orcinus orca</i>	Gulf of California/North	8
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	Mexican Caribbean/North Atlantic	8

## 2. SIGHTINGS DATA

### 2.1 Field work

#### 2.1.1 Systematic

Give brief details of **systematic** surveys, when and where held and references to cruise reports if applicable. A summary table of sightings may be included (e.g. see below).

Target species	Date	Area	No. of sightings	Contact person/institute and references
Humpback whale	27/2 - 16/3/10	Los Cabos, B.C.S.	Over 120	L. Rojas-Bracho, INE
Blue Whale	1/2 – 9/4/10	Gulf of California	80	D. Gendron, CICIMAR-IPN
Fin Whale	1/2 - 28/4/10	Gulf of California	30	D. Gendron, CICIMAR-IPN
Sperm whale	Sept 08 – May 09	Gulf of California	33	D. Gendron, CICIMAR-IPN
Humpback whale	14/11/09 – 17/3/10	Banderas Bay, Nay.	69	R. Moncada-Cooley, ITBB
Gray whale	19/1/10 – 01/4/10	San Ignacio Lagoon, B.C.S.	1873	J. Urbán R., PRIMMA-UABCS A Gómez Gallardo, PRIMMA-UABCS Steve Swartz, CRA
Humpback whale	Jan 2010 2-10/2/10 14-22/2/10 27-28/2/10 13-21/3/10 10-11/4/10	La Paz Bay La Paz-Loreto La Paz –Los Cabos La Paz Bay Gulf of California (southern) Gulf of California (southern)	18 37 47 6 91 5	J. Urbán R., PRIMMA-UABCS A Gómez Gallardo, PRIMMA-UABCS
Bryde's whale	2-10/2/10 14-22/2/10 27-28/2/10 28/3/10-1/04/10 13-21/3/10 10-11/4/10	La Paz-Loreto La Paz –Los Cabos La Paz Bay La Paz Bay Gulf of California (southern) Gulf of California (southern)	7 47 6 7 1 1	J. Urbán R., PRIMMA-UABCS A Gómez Gallardo, PRIMMA-UABCS
Sperm whale	6-10/2/10	Loreto-La Paz	1	J. Urbán R., PRIMMA-UABCS A Gómez Gallardo, PRIMMA-UABCS
Dwarf sperm whale	2-6/2/10	La Paz-Loreto	1	J. Urbán R., PRIMMA-UABCS A Gómez Gallardo, PRIMMA-UABCS
Blue whale	2-6/2/10 28/3 – 1/4/10 10-11/4/10	La Paz-Loreto La Paz Bay Gulf of California (southern)	1 4 2	J. Urbán R., PRIMMA-UABCS A Gómez Gallardo, PRIMMA-UABCS

#### 2.1.2 Opportunistic, platforms of opportunity

In 2004, the Committee **agreed** that details on the data collected by whalewatching vessels and other opportunistic platforms should be included (IWC, 2005b). Opportunistic platforms are those primarily engaged in

non-research activities, such as whalewatching boats, cruise ships, ferries and Coast Guard vessels. Give brief details of work carried out, with references where appropriate. Please give the primary responsibility of the person collecting the data (e.g. vessel crew, naturalist or dedicated observer). Identify one or more types of data collected (separate by species, area and organisation). Types of data may include: sightings (e.g. count, time and location), survey effort, environmental data, photo-ID, animal behaviour or other (please specify). Use an asterisk to identify types of data contributed to a separate archive (such as a regional photo-ID catalogue), and provide the location of that archive in last column. Please make separate entries for each species, area and/or institution.

Primary species	Area	Data type/method	Collected by	Platform	Location of archive (if applicable)	Contact person/institute and refs
Blue whale	Gulf of California	Photo-id*; sightings	CICIMAR	CICIMAR boat	*CICIMAR-IPN	D. Gendron, CICIMAR
Fin whale	Gulf of California	Photo-id*; sightings	CICIMAR	CICIMAR boat	*CICIMAR-IPN	D. Gendron, CICIMAR
Sperm whale	Gulf of California	Photo-id*; sightings	CICIMAR	Sailboat	*CICIMAR-IPN	D. Gendron, CICIMAR

## 2.2 Analyses/development of techniques

Give brief details of any analyses of data carried out, with references where appropriate. A summary table of sightings and associated effort may be included (see below).

Target species	Date	Area	Methods/effort	Parameters/ factors measured	Contact person/institute; refs
Humpback whale	27/2 - 16/3/10	Los Cabos, B.C.S.	Theodolite tracking on shore-based stations.	Distribution, movements, breathing rates, relative abundance (No. animals/effort hour)	L. Rojas-Bracho, INE
Humpback whale	14/11/09 – 17/3/10	Banderas Bay, Nay.	Line transect survey	Distribution and density No. of organism/Km <sup>2</sup> No. of sightings/Km <sup>2</sup>	R. Moncada-Cooley, ITBB
Gray whale	18/1/10 - 1/4/10	San Ignacio Lagoon, B.C.S.	Counting on transect survey	Abundance, Distribution, Group composition	J. Urbán R., PRIMMA-UABCS A Gómez Gallardo, PRIMMA-UABCS Steve Swartz, CRA

## 3. MARKING DATA

### 3.1 Field work

#### 3.1.1 Natural marking data

Provide this in the form of a table, e.g.

Species	Feature	Area/stock	No. photo-id'd	Catalogue (Y/N)	Catalogue total	Contact person/institute; refs
Blue Whale	Flank, flukes	Gulf of California/NE Pacific	69	Y	604	D. Gendron, CICIMAR
Fin Whale	Chevron, dorsal	Gulf of California/North Pacific	30	N	15+	D. Gendron, CICIMAR
Sperm Whale	Fluke	Gulf of California/North Pacific	+ 300	N	840+	D. Gendron, CICIMAR
Humpback whale	Fluke	Banderas Bay North Pacific	No ready	Y	Not ready	R. Moncada-Cooley, ITBB
Humpback whale	Dorsal fin	Banderas Bay/North Pacific	No ready	Y	Not ready	R. Moncada-Cooley, ITBB
Gray whale	visible whale's backs	San Ignacio Lagoon/Eastern Pacific (wintering)	785	In process	3100	J. Urbán R., PRIMMA-UABCS A Gómez Gallardo, PRIMMA-UABCS
Humpback whale	Fluke	Mexico/North Pacific	>1500 total photos, analysis in process	In process	1500 + process	J. Urbán R., PRIMMA-UABCS A Gómez Gallardo, PRIMMA-UABCS
Humpback whale	Dorsal fin	Mexico/North Pacific	>1500 total photos, analysis in process	In process	206 + process	J. Urbán R., PRIMMA-UABCS A Gómez Gallardo, PRIMMA-UABCS
Bryde's whale	Dorsal fin	Gulf of California/ North Pacific	In process	In process	In process	J. Urbán R., PRIMMA-UABCS A Gómez Gallardo, PRIMMA-UABCS
Blue whale	Dorsal fin	Gulf of California/ North Pacific	In process	In process	In process	J. Urbán R., PRIMMA-UABCS A Gómez Gallardo, PRIMMA-UABCS

It would be useful to include the numbers by features recorded for some species e.g. humpback whales, where more than one is commonly used (e.g. flukes, lateral/dorsal fin). This would enable the Secretariat to maintain a directory for information purposes.

### 3.1.2. Artificial marking data

This would include such things as Discovery marks (especially recovery information) or external artificial tags.

### 3.1.3 Telemetry data

Include both satellite and radio-tags. A table is an appropriate way to summarise the data, e.g.:

Species	Tag type	No. successfully deployed	Maximum time transmitting	Contact person/institute; refs

## 3.2 Analyses/development of techniques

Give brief details of any analyses of marking data carried out (e.g. times/distances to resightings, biological parameters, etc.) with references where appropriate.

## 4. TISSUE/BIOLOGICAL SAMPLES COLLECTED

### 4.1 Biopsy samples (summary only)

Species	Area/stock	Calendar year/ season - no.	Archived (Y/N)	No. analysed	Total holdings	Contact person/institute
Blue whale	Gulf of California/NE Pacific	2009/34	Y	34	0	D. Gendron, CICIMAR

Fin whale	Gulf of California/North Pacific	2009/26	Y	0	26	D. Gendron, CICIMAR
Sperm whales	Gulf of California/North Pacific	2009/14	Y	0	14	D. Gendron, CICIMAR
Common bottlenose dolphin	Banderas Bay/North Pacific	2010/2	Y	2		R. Moncada, ITBB
Humpback whale	N. Pacific/Mexico	Jan-April 2010	Y	0	35	J. Urbán R., PRIMMA-UABCS A Gómez Gallardo
Bryde's whale	N. Pacific/Mexico	Jan-April 2010	Y	0	4	J. Urbán R., PRIMMA-UABCS A Gómez Gallardo
Blue whale	N. Pacific/Mexico	Jan-April 2010	Y	0	2	J. Urbán R., PRIMMA-UABCS A Gómez Gallardo
Sperm whale	Mexico	Jan-April 2010	Y	0	3	J. Urbán R., PRIMMA-UABCS A Gómez Gallardo

#### 4.2 Samples from directed catches (commercial, aboriginal and scientific permits) or bycatches

Species	Area/stock	Tissue type(s)*	No. collected	Archived (Y/N)	No. analyse	Contact person/institute
Common bottlenose dolphin	Banderas Bay/North Pacific	Skin	1	Y	1	Roberto Moncada, ITBB

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

#### 4.3 Samples from stranded animals

Species	Area/stock	Tissue type(s)*	No. collected	Archived (Y/N)	No. analyse	Contact person/institute
Common bottlenose dolphin	Banderas Bay/North Pacific	Skin	1	Y	1	Roberto Moncada, ITBB

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

#### 4.4 Analyses/development of techniques

Give brief details of any analyses of data carried out, with references where appropriate.

##### CICIMAR-IPN

Blue Whale: Sex determination, DNA(mt) are completed and other molecular analysis are undergoing. Fatty acids (polar and non-polar), stable isotopes, and steroid hormones determination are undergoing.

Fin Whale: Molecular analyses are undergoing.

Sperm Whale: Sex determination, DNA(mt), fatty acids (polar and non-polar) and stable isotopes are undergoing.

## 5. POLLUTION STUDIES

Information on available samples should be given in Section 4 although any clarification can be given here. The main purpose of this section is to give brief details of work in progress or completed analyses, with references where appropriate.

## 6. STATISTICS FOR LARGE CETACEANS

### 6.1 Corrections to earlier years' statistics for large whales

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

### 6.2 Direct catches of large whales (commercial, aboriginal and scientific permits) for the calendar year 20XX or the season 20XX/XX

Please summarise the information here in the form of a table. However, it must be noted that this summary is not considered to fulfil the obligation to supply data to the Commission as specified in the Schedule.

Species	Type of catch	Area/stock	Males	Females	Total	Struck and lost

### 6.3 Anthropogenic mortality of large whales for the calendar year 2009 or the season 2010/03

#### 6.3.1 Observed or reported ship strikes of large whales (including non-fatal events)

The inclusion of this data was agreed by the Committee in 2004 (IWC, 2005a). If available, please use Latitude and Longitude for location or else specify as much detail as possible. Please indicate type of vessel, e.g. High-speed Ferry (HSF), Large Cargo (LC), Military (M), Fishing Vessel (FV), Passenger Carrying Excursion (PC), Other (O). Fate: Indicate if the whale swam away (X), appeared seriously injured (I), killed (D). Example given.

Whale species	Sex	No.	Date	Location	Vessel	Speed	Fate	How observe	Contact person/institute and refs
Humpback whale	U	1	27/2/07	Oaxaca	FV		X		L. Rojas-Bracho/INE
*Cut in half.									

#### 6.3.2 Fishery bycatch of large whales

The inclusion of this data was agreed by the Committee in 2004 (IWC, 2005a). If available, please use Latitude and Longitude for location. Indicate fate of whale (R = released alive, D = discarded dead or seriously injured, K = kept for sale or specimen), targeted fish species (e.g. tuna, herring, etc.). The Committee also agreed that types of fishing gear involved in bycatch should be documented (IWC, 2005a). **Please use the internationally recognised standard gear description codes from FAO (given in Appendix 1)**, although more detail can be supplied if known. More detailed information and illustrations of the different types of fishing gear can be found on the FAO/FIGIS website<sup>1</sup>. Please also include any instances of entanglement in shark exclusion nets, which are another important source of bycatch. Please indicate how observed: M = records collected as part of a planned cetacean monitoring programme, F = records collected by onboard fishery monitoring scheme, V = records collected by fishermen through vessel logbooks, A = anecdotal reports from any reliable source, with a further distinction of DA if the latter were documented (e.g. photos, rescue teams etc.).

**If no mortality has been reported then please state this in the table (do not leave blank).**

Whale species	Sex	No.	Date	Location	Fate	Targeted fish	Gear	How observed	Source or contact
Gray whale	U	1	19/3/10	27°53'01.02"N; 113°58'23.78" W	R	Lobster	FIX	A	R. Kobelkowsky rebeca_kobel@hotm
Minke whale	U	2	27/2/10	Banderas Bay	R	SX	Net and line	M	R. Moncada, itmar6_mammal@yahoo.com m

<sup>1</sup> [http://www.fao.org/figis/servlet/static?dom=root&xml=tech/gears\\_search.xml](http://www.fao.org/figis/servlet/static?dom=root&xml=tech/gears_search.xml)

Humpback whale	U	1	17/1/10	23°16' 1.56"N; 106°37'26.2"W			GN	A	Oscar Guzón, oscarguzon@oncaexplorations.co
Humpback whale	U	1	7/2/10	23°7' 5.1"N; 106°28'41.7"W	R		Stainless steel cable	A	Oscar Guzón, oscarguzon@oncaexplorations.co
Humpback whale	U	1	21/2/10	23°16' 29.1"N; 106°34'34.1"W			GN	A	Oscar Guzón, oscarguzon@oncaexplorations.co
Humpback whale	U	1	3/2/09	Manzanillo, Colima	R			A	Lorenzo Rojas-Bracho, lrojas@cicese.mx
Humpback whale	U	1	19/2/09	Punta Gorda, Los Cabos, Baja California Sur	R			A	Lorenzo Rojas-Bracho, lrojas@cicese.mx
Humpback whale	U	1	13/3/09	Faro de Campos, Manzanillo, Colima	R			A	Lorenzo Rojas-Bracho, lrojas@cicese.mx
Humpback whale	U	1	1/1/10	Sur de Punta Campos, Colima	R			A	Lorenzo Rojas-Bracho, lrojas@cicese.mx
Comments: Gray whale, lobster traps are attached to buys by long string. The string was entangled around the tail of the whale, tried to cut it off but didn't succeed.									

## 7. STATISTICS FOR SMALL CETACEANS

It was first agreed to include this information in a Commission resolution in 1976 (IWC, 1977, p.31)). Furthermore, in 2005 (IWC, 2006, Annex J) it was agreed that these data should be brought into line with those reported for large cetaceans. **Therefore, this Section should be completed using the same guidelines as given in Section 6 above, *Statistics for large cetaceans*. If no mortality has been reported then please state this in the table (do not leave blank).**

### 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.

### 7.2 Direct catches of small cetaceans for the calendar year 20XX or the season 20XX/XX

Species	Type of catch	Area/stock	Males	Females	Total	Struck and lost

### 7.3 Anthropogenic mortality of small cetaceans for the calendar year 20XX or the season 20XX/XX

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

Species	Sex	No.	Date	Location	Vessel	Speed	Fate	How observed	Contact person/institute and refs
Common bottlenose	M	1	16/08/09	Banderas Bay, Nayarit				Post mortem	R. Moncada/ ITBB
*Cut in half.									

#### 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
Comments: Entangled in gear, cut off and sank.													

## 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.

Species	No. strandings	No. post mortems	Contact person(s)/Institute(s)	Contact email address(es)
Humpback whale	10	8	L. Rojas-Bracho, INE	lrojas@cicese.mx
Sperm whale	1	1	L. Rojas-Bracho, INE	lrojas@cicese.mx
Fin whale	1	1	L. Rojas-Bracho, INE	<a href="mailto:lrojas@cicese.mx">lrojas@cicese.mx</a> El vigía 190ct09
Blue whale	1	1	L. Rojas-Bracho, INE	<a href="mailto:lrojas@cicese.mx">lrojas@cicese.mx</a> El vigía 190ct09
Blue whale	1	1	I. Fuentes	isa_allen05@yahoo.com.mx
Short finned pilot whale	1	1	L. Rojas-Bracho, INE	<a href="mailto:lrojas@cicese.mx">lrojas@cicese.mx</a> El vigía 190ct09
Gray Whale	2	2	R. Kobelkowsky/Mario's Tours	rebeca_kobel@hotmail.com
Common bottlenose dolphin	1	1	R. Moncada/ITBB	itmar6_mammal@yahoo.com.mx
Gray whale	1 calves and 3 adults	4	J. Urbán R./PRIMMA-UABCS A Gómez Gallardo/PRIMMA-UABCS Steve Swartz, CRA	<a href="mailto:jurban@uabcs.mx">jurban@uabcs.mx</a> <a href="mailto:eagg@uabcs.mx">eagg@uabcs.mx</a> <a href="mailto:Kabloon15@comcast.net">Kabloon15@comcast.net</a>
Bryde's whale	11	10	J. Urbán R./PRIMMA-UABCS A Gómez Gallardo/PRIMMA-	<a href="mailto:jurban@uabcs.mx">jurban@uabcs.mx</a> <a href="mailto:eagg@uabcs.mx">eagg@uabcs.mx</a>



			UABCS	
Killer whale	1	1	J. Urbán R./PRIMMA-UABCS A Gómez Gallardo/PRIMMA-UABCS	<a href="mailto:jurban@uabcs.mx">jurban@uabcs.mx</a> <a href="mailto:eagg@uabcs.mx">eagg@uabcs.mx</a>
Dwarf sperm whale	1	1	J. Urbán R./PRIMMA-UABCS A Gómez Gallardo/PRIMMA-UABCS	<a href="mailto:jurban@uabcs.mx">jurban@uabcs.mx</a> <a href="mailto:eagg@uabcs.mx">eagg@uabcs.mx</a>
Minke whale	1		Francisco Valverde/CONANP Gustavo Cárdenas/INE	<a href="mailto:fivals@hotmail.com">fivals@hotmail.com</a> <a href="mailto:gcardena@cicese.mx">gcardena@cicese.mx</a>

## 9. OTHER STUDIES AND ANALYSES

This is the appropriate place to briefly summarise other aspects of cetacean research relevant to the Scientific Committee, including results of analyses and development of techniques not covered in earlier sections. Give references where appropriate.

Attention is drawn to the issues of priority Committee interest, including: management of whaling and Comprehensive Assessment of whale stocks - e.g. current stock size, recent population trends, carrying capacity, productivity and stock identity; effects of environmental change; scientific aspects of sanctuaries; and whalewatching.

### INE

A pilot program was developed to test moorings systems for C-pods in the Vaquita refuge.

## 10. LITERATURE CITED

Include all references cited in the text here. Please follow the official IWC style guide for references (<http://www.iwcoffice.org/publications/styleguide.htm>).

## 11. PUBLICATIONS

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

### 11.1 Published or 'In Press' papers only

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.**

Acevedo-Whitehouse, K., Rocha-Gosselin, A. and Gendron, D. 2010. A novel noninvasive tool for disease surveillance of large free-ranging whales and its relevance to conservation programs. *Anim. Conserv.* <http://www3.interscience.wiley.com/journal/120125137/issue>

Alter, S.E. S. Flores-Ramirez, S. Nigenda, J. Urban- Ramirez, L. Rojas-Bracho, and S.R. Palumbi. 2009. Mitochondrial and nuclear genetic variation across calving lagoons in Eastern North Pacific Gray Whales (*Eschrichtius robustus*). *Journal of Heredity*:100(1):34-46

Barlow, J., L. Rojas-Bracho, C. Muñoz Piña, and S. Mesnick. 2009. Conservation of the vaquita in the northern Gulf of California, Mexico. Chapter 15 in: R. Q. Grafton, R. Hilborn, D. Squires, M. Tait, and M. Williams (eds.) *Handbook of Marine Fisheries Conservation and Management*. Oxford University Press, 784 pgs.

Jaquet, N. and Gendron, D. 2009. The social organization of sperm whales in the Gulf of California and comparisons with other populations. *J. Mar. Biol. Assoc. UK.* 89(5): 975-984.

Jefferson, T.A, P.A. Olson, T.R. Kieckhefer and L. Rojas-Bracho. *In press*. Photo-identification of the vaquita (*Phocoena sinus*): The World's most endangered cetacean. *Lat. Am. Jour. Aquatic Mammals* 6(2): xx-xx

Rojas-Bracho, L and L. Fueyo. 2010. Helping the vaquita to recover: conservation and management actions by Mexico. *Whalewatcher*. :7-10

### 11.2 Unpublished literature

Please include information as to where the documents may be obtained **and if possible, pdf versions or reprints for the library.**

Busquets Vass, G. 2008. Variabilidad de isótopos estables de nitrógeno y carbono en piel de ballena azul (*Balaenoptera musculus*). Master Thesis, Centro Interdisciplinario de Ciencias Marinas, Instituto Politécnico Nacional. 84pp. [In Spanish].

Díaz Gamboa, R. 2009. Relaciones tróficas de los cetáceos teutófagos con el calamar gigante *Dosidicus gigas* en el Golfo de California. Doctoral Thesis, Centro Interdisciplinario de Ciencias Marinas, Instituto Politécnico Nacional. 103pp. [In Spanish].

Espino Pérez, N.M. 2009. Variación temporal en los perfiles de ácidos grasos en la grasa de ballenas azules (*Balaenoptera musculus*) que visitan el Golfo de California. Master Thesis, Centro Interdisciplinario de Ciencias Marinas, Instituto Politécnico Nacional. 56pp. [In Spanish].

Guerrero de la Rosa, F.J. 2008. Variación en la dieta de los cachalotes del Golfo de California con base en isótopos estables de carbono y nitrógeno. Master Thesis, Centro Interdisciplinario de Ciencias Marinas, Instituto Politécnico Nacional. [In Spanish].

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**Appendix 1. FOA fishing descriptions and codes**

<b>FAO FISHING CATEGORIES:</b>	<b>GEAR</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	Longlines (not specified)	LL
Otter trawls (not specified)	OT	Trolling lines	LTL
Pair trawls (not specified)	PT	Hooks and lines (not specified)	LX
Other trawls (not specified)	TX	<b>GRAPPLING AND WOUNDING</b>	
<b>DREDGES</b>		Harpoons	HAR
Boat dredges	DRB	<b>HARVESTING MACHINES</b>	
Hand dredges	DRH	Pumps	HMP
<b>LIFT NETS</b>		Mechanised dredges	HMD
Portable lift nets	LPN	Harvesting machines (not specified)	HMX
Boat-operated lift nets	LNB	<b>MISCELLANEOUS GEAR</b>	MIS
Shore operated stationary lift nets	LNS		

Lift nets (not specified)	LN	<b>RECREATIONAL FISHING GEAR</b> <b>GEAR NOT KNOWN OR NOT SPECIFIED</b> <b>SHARK CONTROL NETS</b> <b>DERELICT FISHING GEAR</b>	RG NK NSC
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