

## Sightings and strandings of beaked whales on the west coast of Canada

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Although they are widespread, little is known of the beaked whales (members of the family Ziphiidae). Very few studies of animals in the wild have been undertaken; most of our knowledge of the various ziphiid species comes from stranded individuals or animals taken in whaling operations (for exceptions, see Claridge & Balcomb, 1995; Whitehead *et al.*, 1997). This is certainly the case for beaked whales off the coast of British Columbia (western Canada). Little has been published on any of the four species recognized from this area. In fact, the last detailed presentation of information on beaked whales from British Columbia (B.C.) was Pike & MacAskie's (1969) comprehensive compilation on the marine mammals of the province. The purpose of this note is to summarize information on beaked whale sightings and strandings in western Canada over the last 30 years. We also include all published stranding records prior to 1970 for comparison purposes (for a review of whaling records off western Canada, see Pike & MacAskie, 1969; Reeves & Mitchell, 1993).

All records available to the authors through 1996 were compiled. The majority of unpublished records were collected through the Stranded Whale and Dolphin Program of British Columbia (SWDP), a volunteer operation established and run by the Marine Mammal Research Group (MMRG) since 1987. Through an extensive advertising program, informing biologists, government employees and the general public of the value of reporting strandings, there has been a dramatic increase in the number of cetacean stranding records over the last ten years (e.g. Baird & Guenther, 1994, 1995). We collected a total of 22 unpublished beaked whale records, and compiled and reviewed an additional 20 published stranding records (of which five were

published in non-peer reviewed sources with limited distribution). Where possible, we included date, locality, record type (stranding, sighting or incidental catch), sex, and length (Table 1). Stranding events were categorized by condition of carcass after Mead *et al.* (1982). Species identifications for previously unpublished stranding records were based on specimen material or photographs in the MMRG and RBCM collections. Genus/species identifications of live animals were based on detailed field notes (two records), photographs (one record), or on the observations of experienced observers (RWB, for two records; Platforms of Opportunity Program (NMFS, Seattle), one record).

Positive species identification was noted for 36 of 42 records (Table 1): Cuvier's beaked whale, *Ziphius cavirostris* (18 strandings, one sighting, one incidental catch); Hubbs' beaked whale, *Mesoplodon carlhubbsi* (seven strandings); Stejneger's beaked whale, *Mesoplodon stejnegeri* (five strandings); and Baird's beaked whale, *Berardius bairdii* (one stranding, three sightings). The remaining records were identified as a probable Cuvier's beaked whale (one sighting), probable Stejneger's beaked whale (one stranding) and *Mesoplodon* sp. (three strandings, one sighting). One of the stranded animals identified only to the genus *Mesoplodon* was an approximately 2-m long individual with erupted teeth in the middle of the mandibles. This combination of features does not match the description of any known species of *Mesoplodon*; unfortunately the specimen was not recovered.

The majority of records (33 of 42) are of single stranded animals (Table 1). Cuvier's beaked whales were recorded throughout the province, with six records on the eastern coasts of southern Graham and Moresby Islands, adjacent to the shallow (<200 m) waters of Hecate Strait. For Baird's beaked whales, although groups of 10-20 individuals were frequently seen by whalers in the mid-1900s (Pike & MacAskie, 1969), the only stranding recorded of this species in the

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Table 1. Stranding and post-whaling sighting records of beaked whales from the coast of British Columbia

Date (dd/mm/yy)	Locality <sup>1</sup>	Latitude	Longitude	Obs. type <sup>2</sup>	Sex (M/F)	Length (cm)	Specimen/ Record No. <sup>3</sup>	Source <sup>4</sup>
<b>Cuvier's beaked whale</b>								
15/07/94	Tian Head, Graham I, QCI	53°47'N	133°07'W	ST6	M	?	SWDP 94-47	2
17/05/93	N Gregoire Pnt, VI	49°54'N	127°11'W	ST4	F	590	SWDP 93-18	3
10/07/91	N Langara I	54°15'N	133°02'W	ST2	F	~470	SWDP 91-30	5
—/09/89	Estevan Pnt, VI	49°23'N	126°30'W	ST5	?	?	SWDP 89-20	12
01/06/89	off Skedans Is, QCI	52°57'N	131°34'W	SI	?	?	—	1
19/05/89	Beresford Bay, Graham I, QCI	54°05'N	133°05'W	ST1	?	?	SWDP 89-05	12
29/08/88	Balcom Inlet, QCI	52°06'N	133°00.1'W	ST1	F	~580	SWDP 88-14	17
—/07/87	Side Bay, VI	50°20'N	127°53'W	ST1	?	?	SWDP 87-23	17
01/09/86	166 nm WSW S Moresby I	51°00'N	135°20.1'W	IC	?	?	SWDP 86-03	1
—/03/78	Swan Bay, Skincuttle Inlt, E Moresby I, QCI	52°20'N	131°18'W	ST2	M	?	SWDP 78-01	1
04/07/71	Swan Bay, Skincuttle Inlt, E Moresby I, QCI	52°20'N	131°18'W	ST6	?	?	SWDP 71-02	1
—/04/69	N of Lawn Pnt, Graham I, QCI	53°26'N	131°55'W	ST6	?	~590	SWDP 69-01	1
—/07/68	QCI	—	—	ST3	?	?	SWDP 68-02	1
—/02/61	Sandspit, Moresby I, QCI	53°16'N	131°49'W	ST3	M	5 <sup>9</sup> 5	UBC 8325	14, 16
winter 59-60	Tow Hill, Graham I, QCI	54°10'N	131°48'W	ST6	M	7 <sup>5</sup>	UBC 7999	14, 16
—/01/54	1.6 km S of Jordan River, VI	48°25'N	124°03'W	ST4	M	~500	BCPM 6416	14, 16
25/05/41	Estevan Pnt, VI	49°23'N	126°33'W	ST3	M	~600	SWDP 41-01	8, 16
—/—/37	Fisherman Bay, VI	50°47'N	128°19'W	ST5	?	?	BCPM 4557	11
ca. 1900	Bella Bella	52°08'N	128°07'W	ST5	?	?	UBC 3691	9
pre-1952	Victoria, VI	48°26'N	123°22'W	ST5	?	?	BCPM 5645	9
<b>Hubbs' beaked whale</b>								
02/10/92	0.5 km S of Pachena Pnt, VI	48°43'N	125°06'W	ST3	F	502	SWDP 92-41	4
—/01/69	Long Beach, VI	49°03'N	125°43'W	ST1	F	526	UBC 9416	7, 13
22/08/67	Florencia Bay, VI	49°00'N	125°38'W	ST1	F	~500	UBC 9360	7, 13
—/07/65	River's Inlet	51°3'-W	127°3'-N	ST5	M	?	UBC 9036	13, 16
03/07/63	Long Beach, VI	49°02'N	125°44'W	ST2	M	274	UBC 9037	13, 16
16/12/62	Prince Rupert	54°17'N	130°22'W	ST3	M	472	SWDP 62-01	13, 16
pre-1977	locality unknown (B.C.)	—	—	ST5	M	~500	BCPM 7721	13
<b>Stejneger's beaked whale</b>								
05/04/82	Point No Pnt, VI	48°23'N	123°58'W	ST4	M	>400	BCPM 11821	1
09/07/73	E side Moresby I, QCI	52°-N	131°-W	ST6	F	?	SWDP 73-02	1
16/04/71	Frederick I, QCI	53°56'N	133°10'W	ST3	M	?	BCPM 7408	1
—/05/59	Long Beach, VI	49°02'N	125°43'W	ST6	F	~500 <sup>5</sup>	UBC 7433	15, 16
—/08/53	Port McNeill, VI	50°35'N	127°06'W	ST5	?	?	UBC 4501	10, 15

Table 1. Continued

Date (dd/mm/yy)	Locality <sup>1</sup>	Latitude	Longitude	Obs. type <sup>2</sup>	Sex (M/F)	Length (cm)	Specimen/ Record No. <sup>3</sup>	Source <sup>4</sup>
Baird's beaked whale								
14/05/96	29 nm W of Tofino, VI	49°54.8'N	126°35.8'W	SI	?	?	—	1
05/05/95	23 nm W of northern VI	50°29.2'N	128°53.1'W	SI	?	?	—	1
—/03/92	Fife Pnt, Graham I, QCI	54°06'N	131°40'W	ST4	?	~600	SWDP 92-20	1
03/07/87	12.3 nm W of Cape Beale, VI	48°49.1'N	128°40.8'W	SI	?	?	POP 187147	1
Unidentified <i>Mesoplodon</i>								
06/06/95	3 nm W of Gowgaia Bay, Moresby I, QCI	52°27'N	131°45'W	SI	?	?	—	1
17/04/91	0.4 km S of Green Pnt, VI	49°03'N	125°43'W	ST4	?	?	SWDP 91-20	5
—/—/87	Pyramid Hill, Graham I, QCI	54°01'N	133°04'W	ST4	?	~200	SWDP 87-27	1
—/—/87	White Pnt, Graham I, QCI	54°00'N	133°07'W	ST6	?	?	SWDP 87-26	1
Unidentified <i>Mesoplodon</i> (probable <i>Stejneger's</i> )								
05/08/79	Nanaimo, VI	49°10'N	123°56'W	ST1	F?	?	SWDP 79-05	6
Unidentified beaked whale (probable <i>Ziphius</i> )								
19/09/94	13 nm W of Zayas I	54°37'N	131°27'W	SI	?	?	—	1

<sup>1</sup>QCI: Queen Charlotte Islands, VI: Vancouver Island.

<sup>2</sup>ST: Stranded specimen, condition (modified after Mead *et al.*, 1982.): 1: alive, 2: freshly dead (<1 week), 3: mod. decomposed (1–2 weeks), 4: advanced decomposition (several weeks), 5: indeterminate (skeletal remains, mummies), 6: condition not provided. SI: sighting, IC: incidental catch.

<sup>3</sup>SWDP: Stranded Whale and Dolphin Program, UBC: University of British Columbia, BCPM: Royal British Columbia Museum, POP: Platforms of Opportunity Program.

<sup>4</sup>1: Unpublished record (details in the MMRG collection); 2: unpublished record, listed in Guenther *et al.*, 1995; 3: unpublished record, listed in Baird *et al.*, 1994; 4: unpublished record, listed in Guenther *et al.*, 1993; 5: unpublished record, listed in Guenther *et al.*, 1992; 6: Baird & Stacey, 1989; 7: Campbell & Stirling, 1971; 8: Cowan, 1945; 9: Cowan & Guiguet, 1952; 10: Cowan & Guiguet, 1965; 11: Cowan & Hatter, 1940; 12: Langelier *et al.*, 1990; 13: Mead *et al.*, 1982; 14: Mitchell, 1968; 15: Moore, 1963; 16: Pike & MacAskie, 1969; 17: Stacey *et al.*, 1989.

<sup>5</sup>There are discrepancies in the literature as to the total length of this and other specimens, which we have been unable to resolve: UBC 7433: Moore (1963: 41.5) lists 16.5 ft (500 cm), whereas Pike & MacAskie (1969: 9) list 12.5 ft (381 cm); we are inclined to accept the former as it is consistent with its description as an adult. UBC 7999: Pike & MacAskie (1969: 13) list 18.5 ft (564 cm), whereas Mitchell (1968: 267) lists 470 cm. UBC 8325: Pike & MacAskie (1969: 12) list 18 ft (545 cm), whereas Mitchell (1968: 267) lists 432 cm.

<sup>6</sup>This species has been tentatively identified as a female *M. stejnegeri*; it is certainly not *M. carlhubbsi* (J. G. Mead, National Museum of Natural History, Smithsonian Institution, Washington DC, pers. comm.).

province was of one individual found dead near the northwestern tip of Graham Island in 1992. A stranded Hubbs' beaked whale in Prince Rupert in 1962 constitutes the northernmost record for the species (Pike & Macaskie, 1969). The five Stejneger's beaked whale strandings ranged from off northwestern Graham Island to southern Vancouver Island. Only two ziphiid records exist from the protected inshore waters of Vancouver Island; one Stejneger's beaked whale and one probable Stejneger's beaked whale. Two areas <60 km across were sites of six or more strandings: mid-western Vancouver Island (four Hubbs' beaked whales, one Stejneger's beaked whale, one *Mesoplodon* sp.) and northwestern Graham Island (three Cuvier's beaked whales, three *Mesoplodon* sp., one Stejneger's beaked whale). No correlation between stranding sites and proximity to deep ( $\geq 1000$  m) water was observed for any of the four species; the region of coastline closest to the 1000 m depth contour (west coast Moresby Island) has no associated stranding records, although this likely reflects a lack of observer effort in this region.

Since the cessation of commercial whaling, sightings of beaked whales at sea have been positively documented on only six occasions in B.C., and incidental catches only once (Table 1). Three of the former were of Baird's beaked whales; occurring in groups of three to 21 animals in offshore waters 700 to 1675 m deep. Both the Cuvier's beaked whale sighting and the *Mesoplodon* sp. sighting were within only a few miles from shore in waters less than 90 and 900 m deep, respectively; a single unidentified beaked whale (probably Cuvier's, based on description) was seen offshore in waters less than 180 m deep near the eastern end of Dixon Entrance. The only incidental catch record of a beaked whale was a Cuvier's beaked whale killed in a fishery for flying squid in 1986 in offshore waters approximately 3300 m deep.

Due to the paucity of available specimens, almost nothing is known of the life history of Hubbs' beaked whales. One pregnant female recovered in this study provides information relevant both to calving seasonality and the length at sexual maturity. On 2 October 1992, a 30.4-cm fetus was recovered from a 502-cm stranded Hubbs' beaked whale. The whale was estimated to have been dead for approximately one week. Using Mead *et al.*'s (1982) calculation for timing of birth (utilizing a 12 month estimated gestation period, a length at birth of 250 cm, and a growth rate estimate of 23 cm/month), timing of birth is estimated as early July. This is in agreement with a summer calving period as suggested by Mead *et al.* (1982). The length of this female (502 cm) also supports Mead *et al.*'s (1982) data regarding length at sexual maturity (they noted one physically immature

female at 500 cm, with physically mature females at 490 and 532 cm).

For Baird's beaked whales, the preponderance of whalers' observations (Pike & Macaskie, 1969) in light of the lack of reported strandings suggests that stranding data may not be indicative of presence or relative abundance; this likely applies to other beaked whale species as well. The number of reported strandings is likely influenced by the rocky, inaccessible nature of much of B.C.'s coastline, and the relative lack of human habitation; areas where stranding records are concentrated (e.g., mid-western Vancouver Island) are characterized by both long stretches of sandy beaches and increased human visitation, increasing the likelihood that a stranded animal will both remain shore-bound and be encountered. The scarcity of photographs, drawings, and descriptive accounts of beaked whales also limits the probability that a stranded animal will be correctly identified or even recognized as a beaked whale.

Similarly, post-whaling sighting records are scant in comparison to the number of whaling records of Baird's beaked whales (Pike & Macaskie, 1969; Reeves & Mitchell, 1993); there are several reasons why we believe beaked whales to be more common than these latter records suggest. There have been very few offshore surveys in B.C. waters in the last 30 years, which likely accounts, at least in part, for the small number of sightings. In addition, there are few individuals in the province experienced at identifying beaked whale species at sea, which similarly reduces the likelihood of their documentation. As whaling ships did not target the other, smaller species of beaked whales, their absence from whaling records likely reflects their non-target status rather than rarity in B.C. waters. Based on the limitations in documenting beaked whale strandings and presence at sea, we suggest that all four species of beaked whales documented to date are more frequent visitors to B.C. waters than sighting and stranding records indicate. The occurrence of the unknown species of small *Mesoplodon* (with erupted teeth in the middle of the mandibles) also suggests that additional species are likely to be documented from B.C. as effort expands.

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### References

- Baird, R. W. & Stacey, P. J. (1989) An annotated list of the marine mammals of British Columbia. *Vic. Nat.* **46** (2), 12–14.
- Baird, R. W. & Guenther, T. J. (1994) Status of porpoises in the British Columbia/Washington trans-boundary area: a Canadian perspective. *Pug. Sound Not.* **34**, 5–8.
- Baird, R. W. & Guenther, T. J. (1995) Account of harbour porpoise (*Phocoena phocoena*) strandings and bycatches along the coast of British Columbia. *Rep. Int. Whal. Comm. Spec. Iss.* **16**, 159–168.
- Baird, R. W., Wischniowski, S. G., Guenther, T. J., McAdie, M. L. & Cornish, T. D. (1994) Strandings and fishing gear entanglements of cetaceans on the west coast of Canada in 1993. Paper SC/46/05 presented to the International Whaling Commission Scientific Committee, May. 7 pp.
- Campbell, R. W. & Stirling, D. (1971) A photoduplicate file for British Columbia vertebrate records. *Syesis* **4**, 217–222.
- Claridge, D. E. & Balcomb, K. C. (1995) Photo-identification of dense beaked whales (*Mesoplodon densirostris*) in the northeastern Bahamas. 11th Bien. Conf. Biol. Mar. Mamm. 14–18 December, 1995, Orlando, FL (Abstract).
- Cowan, I. McT. (1945) A beaked whale stranding on the coast of British Columbia. *J. Mamm.* **26**, 93–94.
- Cowan, I. McT. & Guiguet, C. J. (1965) The mammals of British Columbia. British Columbia Provincial Museum Handbook No. 11., Victoria, B. C. 414 pp.
- Cowan, I. McT. & Guiguet, C. J. (1952) Three cetacean records from British Columbia. *Murrelet* **33**, 10–11.
- Cowan, I. McT. & Hatter, J. (1940) Two mammals new to the known fauna of British Columbia. *Murrelet* **21**, 9.
- Guenther, T. J., Baird, R. W., Bates, R. L., Willis, P. M., Hahn, R. L. & Wischniowski, S. G. (1995) Strandings and fishing gear entanglements of cetaceans off the west coast of Canada in 1994. Paper SC/47/06 presented to the International Whaling Commission Scientific Committee, June. 7 pp.
- Guenther, T. J., Baird, R. W., Ford, J. K. B., Langelier, K. M., McAdie, M. L., Wischniowski, S. G. & Cornish, T. E. (1993) Cetacean strandings and entanglements in fishing gear on the west coast of Canada during 1992. Paper SC/45/04 presented to the International Whaling Commission Scientific Committee, May. 7 pp.
- Guenther, T. J., Baird, R. W., Langelier, K. M., Ford, J. K. B., Ellis, G. M., Stacey, P. J. & Cornish, T. E. (1992) Cetacean strandings and entanglements in fishing gear on the Canadian west coast during 1991. Paper SC/44/015 presented to the International Whaling Commission Scientific Committee, June. 8 pp.
- Langelier, K. M., Stacey, P. J. & Baird, R. W. (1990) Stranded whale and dolphin program of B.C.—1989 report. *Wildl. Vet. Rep.* **3**(1), 10–11.
- Mead, J. G., Walker, W. A. & Houck, W. J. (1982) Biological observations on *Mesoplodon carlhubbsi* (Cetacea: Ziphiidae). *Smithsonian Contributions to Zoology* **344**, 25 pp.
- Mitchell, E. (1968) Northeast Pacific stranding distribution and seasonality of Cuvier's beaked whale *Ziphius cavirostris*. *Can. J. Zool.* **46**, 265–279.
- Moore, J. C. (1963) Recognizing certain species of beaked whales of the Pacific Ocean. *Am. Midl. Nat.* **70**, 396–428.
- Pike, G. C. & MacAskie, I. B. (1969) Marine mammals of British Columbia. *Fish. Res. Board Can. Bull.* **171**, 54 pp.
- Reeves, R. R. & Mitchell, E. (1993) Status of Baird's beaked whale, *Berardius bairdii*. *Can. Field-Nat.* **107**, 509–523.
- Stacey, P. J., Baird, R. W. & Langelier, K. M. (1989) Stranded whale and dolphin program—1988 report. *Wildl. Vet. Rep.* **2**(1), 10–11.
- Whitehead, H., Gowans, S., Faucher, A. & McCarrey, S. (1997) Population of northern bottlenose whales in the Gully, Nova Scotia analyzed using mark-recapture methods on photographic individual identifications. *Mar. Mamm. Sci.* **13**(2), 173–185.

