

CALVING SEASONALITY OF DALL'S PORPOISE
IN THE EASTERN NORTH PACIFIC

Morejohn's (1979) statement that Dall's porpoises (*Phocoenoides dalli*) in the eastern North Pacific give birth year-round has been widely cited (e.g., Leatherwood *et al.* 1982, Calkins 1986, Evans 1987). It is suspect, however, because it differs from what is known about the species in the rest of its range, and from most sighting records of calves (see Gaskin *et al.* 1984, Jefferson 1987).

Four newborn Dall's porpoises were examined by the author during July of 1987 and 1988. All had muted color patterns, and some evidence of umbilical remnants, fetal folds, and fetal dorsal fin orientation. These four summer birth records prompted a re-examination of calving records for this species in the eastern North Pacific (Table 1). The literature was searched for records of fetuses, neonates, and other evidence of parturition. Approximate birth dates were computed for fetuses and calves, using a birth size of 100 cm (Mizue *et al.* 1966, Kasuya 1978), a fetal growth rate of 10 cm/mo (Kasuya 1978), and a first-year growth rate of 3.75 cm/mo—based on a length at one year of about 145 cm (Newby 1982). These parameters are based on large sample sizes from the western Pacific. The results indicate a large calving peak in summer (62% are from June through August), and a smaller peak in spring (15% are from March). There is no evidence for any births during the winter months of November through January. All of the eight records that Morejohn (1979) presented are also shown in Table 1. These do not indicate year-round calving as he suggested, but are consistent with spring to summer parturition.

Censusing Dall's porpoise calves from vessels is difficult, because newborn calves do not ride bow waves, can be difficult to distinguish from a distance (especially in poor sighting conditions), and cow/calf pairs may even avoid vessels (Kasuya and Jones 1984). Nonetheless, most reported eastern Pacific calf sightings are from summer to fall, even where there has been effort throughout the year (Cowan 1944, Ridgway and Green 1967, Loeb 1972, Hall 1981, Dohl *et al.* 1983, Jefferson 1987, Miller 1988).

Phocoenoides dalli is known to have unimodal summer calving peaks in the Sea of Japan and Okhotsk Sea (Okada and Hayashi 1951), off the Pacific coast of Japan (Kasuya 1978), and in the northwestern North Pacific and Bering Sea (Mizue and Yoshida 1965, Mizue *et al.* 1966, Newby 1982, Jones *et al.* 1985). It thus appears that a strong summer calving peak is the norm for this species throughout its range, including the population or populations off California, Oregon, Washington, British Columbia, and Alaska (although the calving season seems to be more protracted in the eastern North Pacific). This is also the case for several other eastern North Pacific small cetaceans (Ridgway and Green 1967). All available evidence indicates that births occur between early spring and early fall, with a strong peak in June, July, and August. The confusion that has surrounded this issue emphasizes how little is known of the life history of this species in North American waters. Further study should include attempts

Table 1. Calving records and estimated birth dates for 34 eastern North Pacific *Phocoenoides dalli* specimens.

Specimen	Date collected	Estimated birth	Source
California			
45 cm fetus	22 March 1952	early September	Morejohn 1979
145 cm juvenile (Tac 59-2D)	28 March 1959	late March	Fiscus and Niggol 1965
41 cm fetus	3 February 1965 ^a	late July	Ridgway 1966 (also Morejohn 1979)
88 cm fetus	17 May 1965 ^a	late June	Ridgway 1966 (also Morejohn 1979)
85 cm fetus	May 1966	mid June to mid July	Ridgway and Green 1967
31 cm fetus	21 January 1968	mid August	Morejohn 1979
115 cm neonate	29 July 1970	late March	Loeb 1972 (also Morejohn 1979)
42 cm fetus (C-137)	9 February 1971	early August	Loeb 1972 (also Morejohn 1979)
71.5 cm fetus (LACM 84112)	18 April 1971	mid July	Cowan <i>et al.</i> 1986
Adult female with extruding embryonic membranes (C-160)	13 July 1972	mid July	Morejohn 1979
102 cm neonate (REJ 670)	28 June 1973	mid June	Jones 1981
119 cm neonate	5 February 1974	early September	Morejohn 1979
45 cm fetus	14 March 1975	late August	C. D. Woodhouse, personal communication
1.5 cm fetus (mother LACM 54569)	27 September 1977	late July	J. E. Heyning, personal communication
105 cm neonate (HSU 2725)	12 July 1978	early June	Sullivan and Houck 1979
136 cm juvenile (C-211)	13 January 1979	late March	San Jose State University collection, unpublished
105 cm neonate (RLD 62)	31 July 1984	late June	Marine Mammal Events Program 1984
205 cm lactating female (CAS 3933)	6 November 1986	early July to early November (midpoint early September) ^b	I. D. Szczepaniak, personal communication
118 cm neonate	18 July 1987	late February	Marine Mammal Events Program 1988
106 cm neonate ("Miwok")	26 July 1987	early June	Jefferson, unpublished
99 cm neonate (LML 88-4)	5 July 1988	early July	Jefferson, unpublished
103 cm neonate (NAB 002)	10 July 1988	mid June	Jefferson, unpublished
103 cm neonate (TAJ 179)	28 July 1988	early July	Jefferson, unpublished

Table 1. Continued.

Specimen	Date collected	Estimated birth	Source
		Oregon	
113 cm neonate (OIMB-C-0026)	24 June 1981	early March	J. Hodder, personal communication
142 cm juvenile (MMP 204)	13 April 1982	early May	Beach <i>et al.</i> 1985
94 cm neonate (788-986)	18 July 1988	mid July	R. F. Brown, personal communication
		Washington	
195 cm lactating female (LMT 001-78)	18 July 1978	mid March to mid July (mid-point mid May) ^b	Everitt <i>et al.</i> 1979
132 cm juvenile (MMP 029)	17 June 1980	early October	Beach <i>et al.</i> 1985
95 cm neonate	2 August 1985	early August	Marine Mammal Events Program 1986 ^a
112 cm neonate (FNW 86-023)	8 September 1986	early June	Marine Mammal Events Program 1986 ^b
		British Columbia	
121 cm neonate (87-13)	27 August 1987	early March	R. W. Baird, personal communication
127 cm neonate (88-04)	8 May 1988	early October	R. W. Baird, personal communication
		Alaska	
52 cm fetus (USNM 251759)	15 March 1925	early August	J. G. Mead, personal communication
102 cm fetus (mother USNM 286884; BDM 400)	16 August 1950 (dead for <i>ca.</i> 3 wk)	late July	Scheffer 1953

^a Morejohn (1979) reported the capture dates of the mothers. The fetuses were measured at the time of the mothers' deaths in captivity, however, in each case approximately one month later (correct dates from Ridgway 1966).

^b Although the length of the lactation period is unknown, most recent evidence suggests that it is short, less than about four months (Loeb 1972, Newby 1982). If this is true, then these females would have given birth up to four months previously (the midpoint is used for analysis).

at following tagged and/or naturally-recognizable individuals throughout their lifetimes, to fill in the gaps in our knowledge.

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