

Status of Dall's Porpoise, *Phocoenoides dalli*, in Canada*

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Dall's Porpoise, *Phocoenoides dalli*, is one of the most commonly sighted cetaceans throughout its range in temperate waters of the North Pacific Ocean and surrounding seas. Dall's Porpoises are common both offshore and in deep inshore waters of British Columbia. There appear to be few serious conservation problems in the eastern Pacific at present, although little is known of the behaviour and ecology of this species. Probably the major threat facing this species in Canada is environmental contamination by such substances as organochlorines and heavy metals. Much more research is needed before these threats can be properly assessed but, in the meantime, a conservative approach to porpoise management is suggested.

Le marsouin de Dall, *Phocoenoides dalli*, est l'un des cétacés les plus couramment aperçus dans toute son aire de distribution en eaux tempérées de l'océan Pacifique nord et des mers voisines. Le marsouin de Dall est commun tant dans les eaux du large que dans les eaux côtières profondes de la Colombie-Britannique. Actuellement, la conservation de cette espèce présente peu de problèmes importants dans l'est du Pacifique, bien qu'on connaisse peu de chose de son comportement et de son écologie. La contamination de l'environnement par, notamment, les organochlorés et les métaux lourds constitue probablement le principal danger pouvant menacer l'espèce au Canada. Une évaluation adéquate de ce genre de dangers nécessiterait des recherches beaucoup plus importantes et l'on propose, entre temps, de procéder avec prudence à la gestion de ce marsouin.

Key Words: Dall's Porpoise, *Phocoenoides dalli*, cetaceans, British Columbia, status.

Dall's Porpoise, *Phocoenoides dalli* (True 1885), despite being a commonly-sighted species in the North Pacific, is rather poorly known in most aspects of its ecology and population biology. The published literature on this species has recently been reviewed (Jefferson 1988), and therefore this report focuses only on information relevant to its status in British Columbia.

Dall's Porpoise is the largest member of the porpoise family (Phocoenidae), growing to lengths of about 220 cm and weights of 200 kg (Leatherwood et al. 1982). These animals are extremely robust, with small heads and small appendages (Figure 1). The wide-based triangular dorsal fin is slightly recurved at the tip, and the caudal peduncle is strongly keeled, especially in adult males (Jefferson 1990).

The colour pattern is diagnostic. A ventrally-continuous white patch extends up on both flanks and forward to the level of the dorsal fin on the predominantly black body. White to light gray areas occur on the upper half to two-thirds of the dorsal fin, and the rear borders of the flukes. This "frosting" is not present on newborns. There appear to be several colour morphs, including gray, all-black, and all-white forms. A discrete population off the Pacific coast of Japan has a larger flank patch (this colour morph is called *truei*-type, as opposed to *dalli*-type; Kasuya 1982).

Distribution

Phocoenoides dalli is a North Pacific endemic, being found from northern Baja California, Mexico, north to the southern Chukchi Sea, and south to southern Japan (Figure 2). The species is only common between 32°N and 62°N in the eastern North Pacific (Nishiwaki 1967; Morejohn 1979).

Off the west coast of Canada, Dall's Porpoises are found mostly over the Continental Shelf and slope, but also more than 2400 km from shore (Pike and MacAskie 1969). They are seen year-round in the deeper inshore waters of British Columbia (Leatherwood et al. 1982).

There are 15 published specimen records and over 300 sighting records from British Columbia (Cowan 1944; Scheffer 1949; Pike and MacAskie 1969; Jefferson 1987; Baird et al. 1988) Off the coast of Canada, Dall's Porpoises are found mostly over the continental shelf and slope, but occasionally more than 2400 km from shore (Pike and MacAskie 1969). They are seen year-round in the deeper inshore waters off British Columbia, such as Hecate Strait, Laredo Channel, Queen Charlotte Sound, Goletas Channel, Queen Charlotte Strait, Johnstone Strait, and Strait of Juan de Fuca (Cowan 1944; Pike and MacAskie 1969; Leatherwood et al. 1982; Jefferson 1987).

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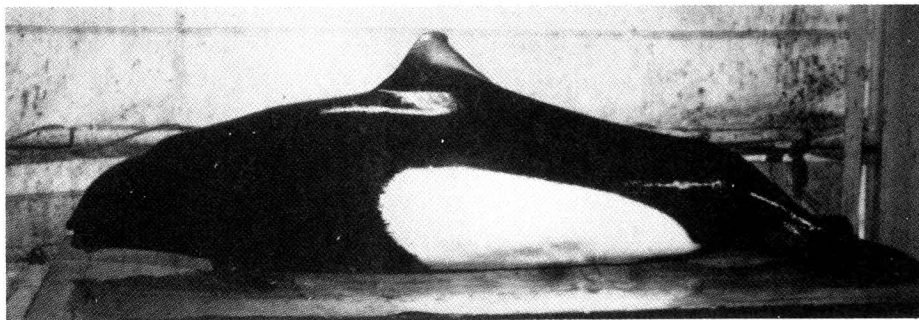


FIGURE 1. Adult Female Dall's Porpoise, *Phocoenoides dalli* (photograph by the author).

Protection

Dall's Porpoise is protected in Canadian waters under the 1982 Cetacean Protection Regulations of the Fisheries Act of Canada of 1970. In United States waters, primary protection is provided by the Marine Mammal Protection Act of 1972. International protection measures include listing in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which regulates international trade.

Population Size and Trends

The population status of animals in the eastern North Pacific is not known, and there are no abundance estimates for British Columbia. Leatherwood et al. (1982) called *Phocoenoides dalli* the most abundant porpoise north of Vancouver Island. The entire North Pacific Ocean and Bering Sea population is estimated to be 1.4 to 2.8 million animals (Jones et al. 1987). The population trend is unknown, but because there is no evidence of major mortality, it is assumed to be relatively stable in the eastern Pacific. The western Pacific and Bering Sea stocks are heavily exploited and some may be at risk (Jones et al. 1987; Perrin 1988).

Habitat

The species is widespread along the British Columbia coast, and is quite common both inshore and offshore. Cowan (1944) suggested that in inshore areas, Dall's Porpoises select open-ended channels with strong currents. The primary habitat is cool ($< 17^{\circ}\text{C}$), deep ($> 180\text{ m}$), continental shelf and slope waters (Jefferson 1988). Morejohn (1979) suggested that movements are mainly due to availability of prey, which consists of various species of squid and small schooling fishes. Many different prey species are known from throughout the range, and the Dall's Porpoise is thought to be an opportunistic feeder (Stroud et al. 1981),

although the stomachs of four specimens from British Columbia contained only Pacific Herring, *Clupea harengus* (Cowan (1944). There is no evidence of significant habitat change in British Columbia.

General Biology

Reproductive Capability: Very little information is available on Dall's Porpoise reproduction in the eastern North Pacific. There is apparently a very strong summer calving peak (as in the rest of the range) in the months of June through August, and a smaller peak in March (Jefferson 1989).

Most information comes from the western Pacific, where large-scale fishery interactions provide large samples for analysis. *Dalli*-type males become sexually mature at an age of 4 to 6 years and a length of 180 to 186 cm, and females



FIGURE 2. General distribution of the Dall's Porpoise in the eastern North Pacific.

at 3.5 to 4.5 years and 174 to 177 cm (Kasuya and Shiraga 1985; Jones et al. 1987; Miyazaki 1987). *Truei*-type animals become mature at body lengths about 12 to 17 cm greater than these (Kasuya 1978; Kasuya and Shiraga 1985). Most females appear to have an annual reproductive cycle (Kasuya and Jones 1984; Jones et al. 1987). Gestation lasts about 10 to 11 months (Jones et al. 1983); and the lactation period is unknown, but it is thought to be very short, perhaps 2 to 4 months (Newby 1982).

Species Movement: Dall's Porpoises in the eastern North Pacific, although present throughout their range year-round, tend to have inshore and southern shifts in abundance for the winter, and offshore and northern shifts for the summer (Leatherwood et al. 1982). They are present both inshore and offshore in British Columbia all year, although there seems to be an offshore shift in abundance for the summer (Pike and MacAskie 1969; Leatherwood et al. 1982).

Behaviour/Adaptability: These animals are avid bow-riders, and are thought to be among the fastest swimming small cetaceans. When bow-riding or moving quickly they produce a distinctive rooster-tail splash. Porpoises not reacting to vessels often surface in a slow roll, with no splash. At these times, the deepened peduncle is visible above the surface. This type of surfacing seems to be predominant in inshore waters (Jefferson 1987; Miller 1988a). Dall's Porpoises rarely breach or indulge in other aerial behaviour.

Porpoises are attracted to vessels in both inshore and offshore waters, especially to bow-ride, but they sometimes avoid vessels as well (Withrow et al. 1985). In particular, cow/calf pairs often avoid ships (Kasuya and Jones 1984).

Groups are generally small (less than 10 animals) and fluid, and are composed of very small subgroups which may aggregate at times, especially for feeding (Miller 1988b). Large aggregations of up to several thousand are occasionally seen (Scheffer 1950).

The degree of habitat specialization has not been well studied in this species. Inshore calving areas have been proposed for both major study areas in Puget Sound, Washington and Johnstone Strait, British Columbia (Jefferson 1987; Miller 1988a), but young calves are seen offshore as well, especially in the western Pacific (Kasuya and Jones 1984; Kasuya and Ogi 1987). Feeding presumably occurs throughout the range.

Limiting Factors

Killer Whales, *Orcinus orca*, and to a lesser extent, large sharks, are potential predators but

the degree of predation is unknown (Pike and MacAskie 1969; Morejohn 1979; Newby 1982). Dall's Porpoises are rarely preyed upon by resident whales in British Columbia, but transient Killer Whales attack marine mammals (Bigg et al. 1987). There is little evidence that sharks regularly take healthy animals (Dall's Porpoises may swim too fast for most sharks), although one may speculate that they may weed-out sick or injured porpoises that are less able to avoid them.

Parasite infestations are common and often extensive in this species (Walker 1975), but the role they play in natural mortality is unknown. Disease factors have not been adequately studied in *Phocoenoides dalli*.

Human disturbance or disruption of activities is not thought to be a serious problem at present. As noted by Miller (1988a), these animals generally have complete control over encounters with boats, and it is indeed nearly impossible to follow them if they do not want to be followed. Heavy sustained vessel traffic in major feeding or breeding areas, however, could potentially disrupt activities or cause abandonment of the area. Future oil and gas exploration activities could pose a threat to this species, although the risk is still largely unknown (Geraci and St. Aubin 1980; Wursig 1990). One can speculate that a major oil spill in a critical feeding area could be harmful.

Although some incidental mortality occurs due to fishing operations, no major fishery conflicts are known in Canada. Small numbers have been reported to be captured in gillnets and trawl nets (Everitt et al. 1979; Jefferson 1987; R. W. Baird, Victoria, British Columbia; personal communication), and 58 were taken in 1987 in the experimental squid driftnet fishery, but this fishery has since been discontinued (Baird et al. 1988). The species has a tendency to entangle in gillnets, however, and the possibility of undocumented problems exists.

The largest potential threat to this species in Canadian waters may be environmental pollution by human activities. Little work has been done in the eastern Pacific, but Japanese scientists have recently explored levels of organochlorines and heavy metals in porpoises from the western Pacific. Small cetaceans were found to be poorly equipped to metabolize PCBs (Tanabe et al. 1988). High PCB and DDE levels can result in decreased testosterone levels, possibly impairing reproduction (Subramanian et al. 1987b). Perhaps most disturbing was the discovery that excretion of pollutants by females occurs mainly through parturition and lactation (Subramanian et al. 1987a). Thus, it is possible that young Dall's

Porpoises in some areas are starting their lives with already high levels of environmental contaminants.

Special Significance of the Species

Dall's Porpoises are known to most people who frequent the deeper coastal waters of the western United States and British Columbia. Although they support no industry of their own, Dall's Porpoises often delight passengers on whale-watching and nature cruises along the west coast. Their bow-riding antics never cease to thrill those lucky enough to see them, and these cruises would certainly lose some of their appeal without them.

The species normally feeds on small schooling fishes and squids that are not highly prized by sport and commercial fishermen. Because it is an upper level carnivore that accumulates pollutants, it might be used as a biological indicator of the health of local ecosystems (Tanabe et al. 1983).

Evaluation

There is no evidence that Dall's Porpoise populations in British Columbia are being depleted at present. Although several western Pacific populations may be depleted, *Phocoenoides dalli* is considered to be common in Canada. However, there is a lack of information on potential threats, and until more is known, a conservative management approach should be taken.

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