

A PROGRAM TO MONITOR THE STATUS OF SMALL CETACEANS IN BRITISH COLUMBIA

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INTRODUCTION

Since 1987 the Marine Mammal Research Group has coordinated a program to monitor sightings, strandings and incidental mortality of cetaceans in the province (see e.g., Baird and Guenther in press; Baird and Stacey 1991, 1993; Baird *et al.* in press; Guenther *et al.* 1993). The purpose of this report is to summarize information on the program, emphasizing the type of information collected and its use in evaluating and monitoring the status of small cetaceans, particularly Dall's porpoise (*Phocoenoides dalli*) and harbour porpoise (*Phocoena phocoena*), in the province.

METHODS

The program utilizes a toll-free telephone number to collect information from the public (1-800-665-5939). This number is advertised province-wide in coastal communities. A log-book program is also used to collect information from whale watching vessels, researchers, lighthouse keepers, fishery patrol vessels, and some commercial fishermen. When stranded cetaceans are reported (the majority of which are animals found dead on a beach or floating), specimens are collected for examination of natural and anthropogenic causes of mortality, feeding habits, levels of contaminants, and for genetic and life history studies.

RESULTS

Since the inception of the program almost 300 stranding records and approximately 6,000 sighting records of 20 different species of whales, porpoises and dolphins have been collected. Several biases exist in the distribution of records. The majority of records are concentrated in highly populated areas in southern British Columbia (see e.g., Figure 1), and a seasonal bias also occurs, with few records obtained in winter months.

The number of both sighting and stranding records has increased each year since the inception of the program. The trend in stranding records shown in Figure 2 likely represents an increase in effort, rather than an increase in the number of animals stranding in the province each year. The most common stranded cetaceans each year are Dall's porpoise and harbour porpoise, and in fact the programs' value is greatest in monitoring the distribution, relative abundance, causes of mortality and natural history of these two species.

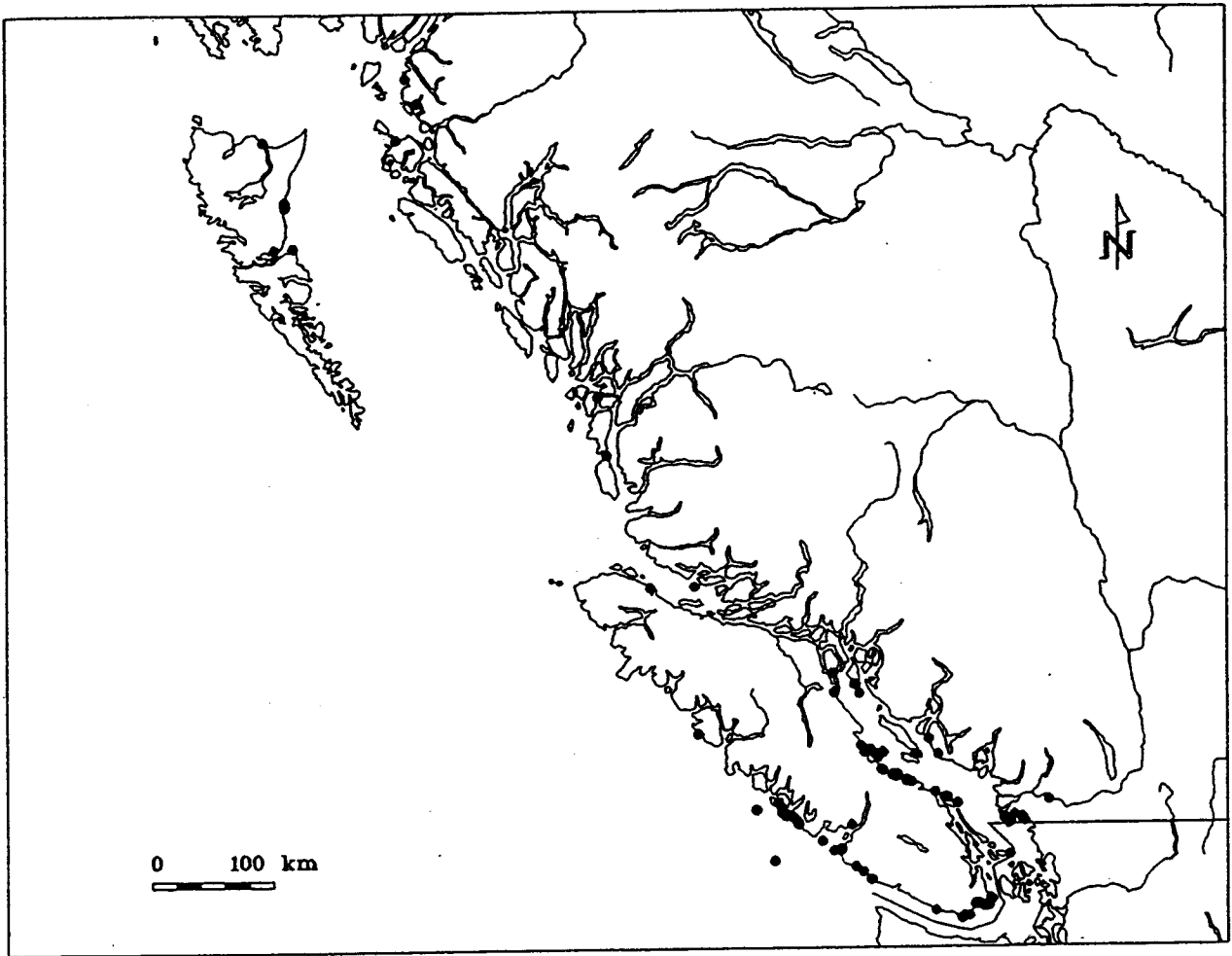


Figure 1. Distribution of stranding and incidental catch records for harbour porpoises (1934-1993), reflecting a geographic bias in reporting effort to populated areas.

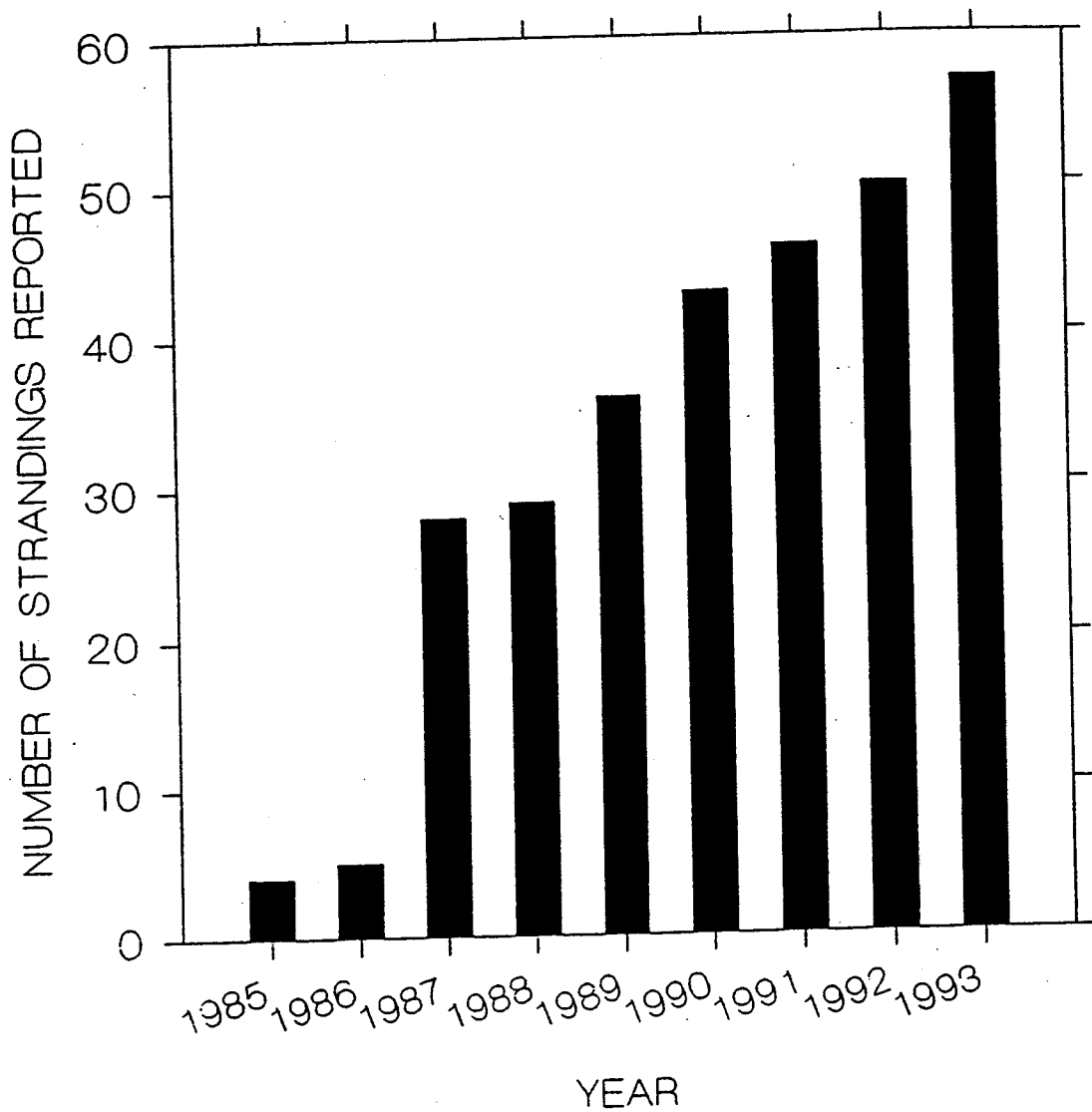


Figure 2. Trend in the number of stranding and incidental catch records reported in British Columbia since 1985. The sudden increase in records in 1987 represents the establishment of the Stranded Whale and Dolphin Program of B.C., while the steady increase in records since then represents a gradual increase in reporting effort.

Information on relative abundance of these two species can be used to identify areas of concentration, even in the absence of other measures of observational effort. For example, utilizing sightings collected in the Victoria area from 1987-1991, there are clear differences in habitat use between Dall's and harbour porpoise (Figure's 3 and 4). Harbour porpoise appear to be generally restricted to depths between 10 and 100 m, while Dall's porpoise are found in virtually all areas deeper than 50 m (Baird and Guenther 1991).

TRENDS

No information is available on trends in abundance of Dall's porpoise. For harbour porpoise however, anecdotal evidence implies a general decline in abundance since the 1940's. More recently, a comparison of harbour porpoise records around southern Vancouver Island collected between 1987-1993 (Baird and Guenther 1991; Baird unpublished) with records collected through surveys undertaken in the late 1970's (Everitt *et al.* 1980; Flaherty and Stark 1982) indicates a large decline in the population in Haro Strait and Boundary Pass.

SOURCES OF MORTALITY

Anthropogenic sources of mortality identified include accidental drowning in commercial salmon drift gillnet fisheries, salmon seine fisheries, trawl fisheries, and federal government test and research fisheries. Two harbour porpoises also washed up in Boundary Bay which were killed in U.S. native set gillnet fisheries in the Semiahmoo Bay area of Washington State, apparently the first evidence of cetacean mortality in that fishery (Baird and Guenther in press). Unfortunately no information is available to estimate absolute levels of mortality.

When comparing the size distribution of stranded harbour porpoise in British Columbia with stranding records from elsewhere in North America, there appears to be an unusually high level of neonatal mortality (Baird and Guenther in press). The cause(s) of this high level of neonatal mortality remains unknown however. A combination of sighting and stranding information also allows for the determination of unusual population events, while the occurrence of such events may be missed by periodic population censuses. For example, a small-scale "die-off" of porpoises was recorded around southern Vancouver Island in the spring of 1993. Twenty-four porpoises (both harbour and Dall's) were found dead around Victoria over a two month period, about a ten-fold increase over the average number occurring in that period in previous years (Baird *et al.* 1993). Sighting information collected during this period indicated that the large number of dead porpoises recorded was not due to an increase in the number of porpoises in the area.

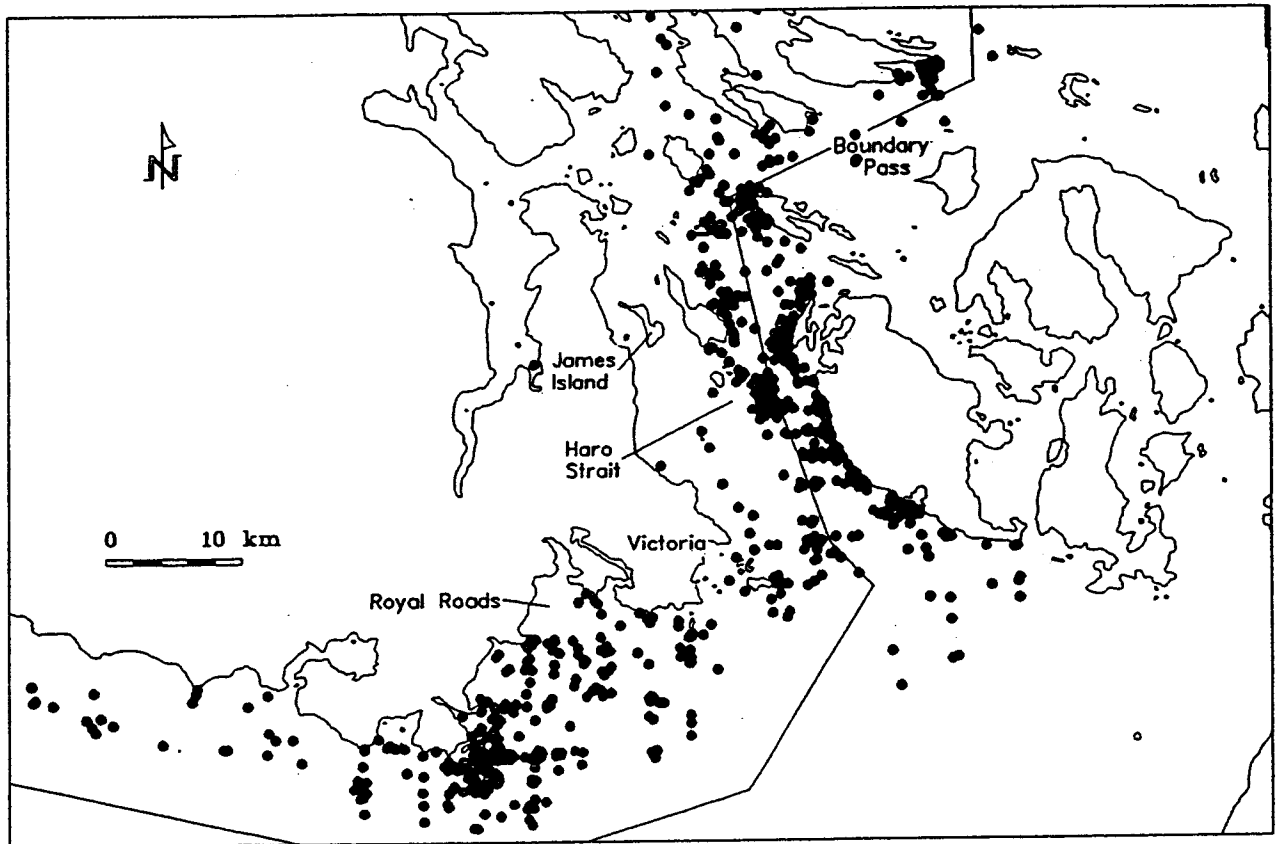


Figure 3. Distribution of sightings of Dall's porpoise in the Victoria area (1987-1991). Note the concentration of records in eastern Haro Strait and in Boundary Pass and the lack of records around James Island and in the Royal Roads area.

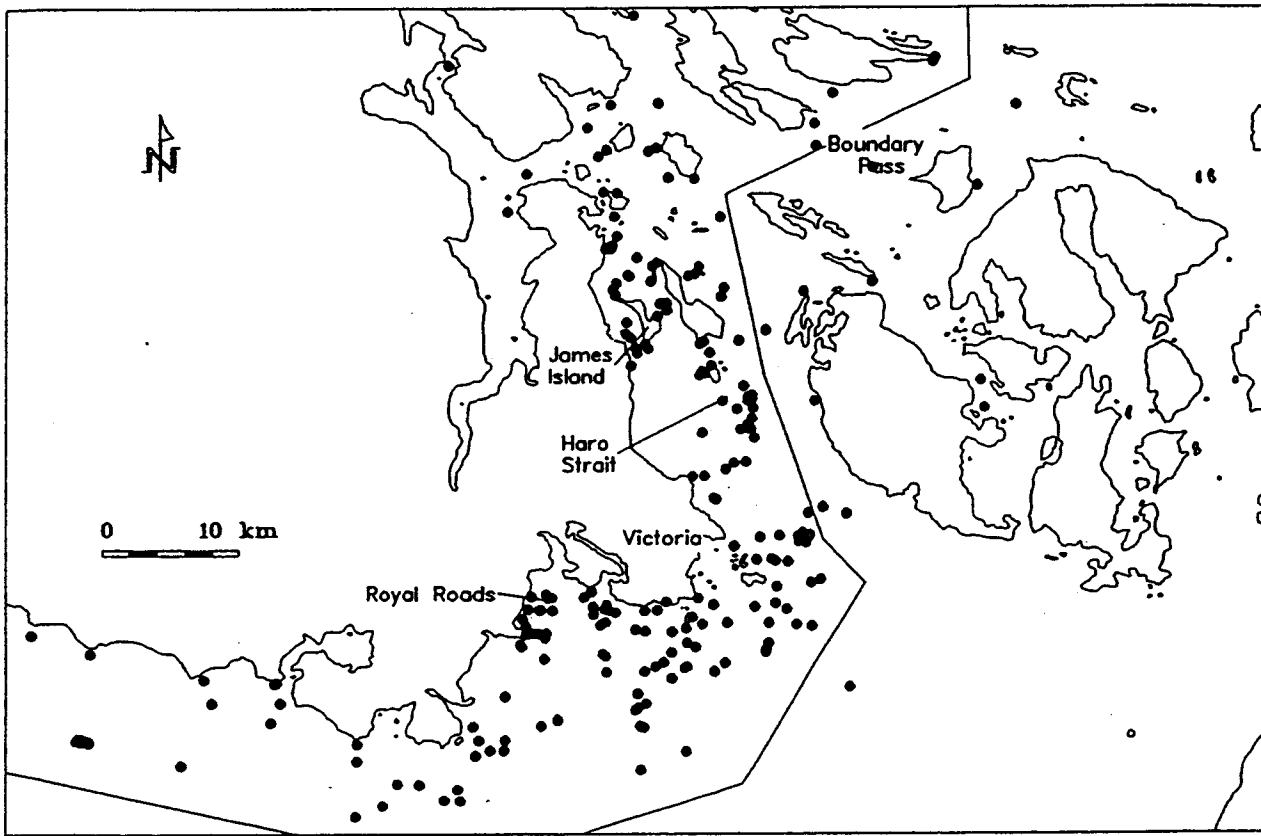


Figure 4. Distribution of sightings of harbour porpoise in the Victoria area (1987-1992), recorded from the same sources as records shown in Figure 3. Virtually no harbour porpoises were recorded in eastern Haro Strait and Boundary Pass, while sightings are regularly recorded around James Island and in the Royal Roads area. Comparisons in distribution of records between species can be used to identify areas of concentration for harbour and Dall's porpoise.

CONTAMINANT ANALYSIS

Samples of liver, kidney and blubber from approximately 35 porpoises have been analyzed for heavy metals and organochlorines. In addition, samples from over 20 additional individuals of other species of cetaceans have been analyzed. These include killer whale (*Orcinus orca*), false killer whale (*Pseudorca crassidens*), Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), gray whale (*Eschrichtius robustus*) and minke whale (*Balaenoptera acutorostrata*). Information on some of these contaminant analyses have been previously presented (see e.g., Baird *et al.* 1993).

RESEARCH NEEDS/FUTURE PLANS

For a variety of reasons (outlined below) harbour porpoise are the most valuable and important candidate for monitoring programs, of the three species of small cetaceans which are regularly found in the province. Harbour porpoises are the most common stranded species of cetacean in the province, therefore the largest sample sizes for toxicology and pathology would be available for this species. As noted, there is circumstantial evidence of a population decline in southern B.C. since the late 1940's, and between the late 1970's and the last five years, but the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was unable to designate the B.C. population due to insufficient information (while the east coast population listed as Threatened). Pollutant ratio information and their year-round presence implies that harbour porpoise have fairly limited movements (Calambokidis and Barlow 1991); thus animals found in areas like the Strait of Georgia likely reside there year-round. As they are generally restricted in habitat to shallow (< 100 m) water, this species is the most likely species of cetacean to spend extended periods of time in prolonged exposure to anthropogenic influences. Their propensity for entanglement in fishing gear also puts harbour porpoise populations at risk in the province. Lastly, utilizing samples collected through this program, it was determined that harbour porpoises have the highest levels of dioxins and furans for cetaceans in the Strait of Georgia, as well as high levels of organochlorines and heavy metals (Muir *et al.* 1991).

A variety of factors are necessary to evaluate and monitor the status of harbour porpoise in the province. These include:

1. Mapping the extent of habitat available for harbour porpoise to identify areas where surveys should be undertaken.
2. Increasing effort for sightings/strandings in northerly and remote areas of the province, as well as effort during winter months.

3. Evaluating levels of incidental mortality in fisheries. This could be done through the use of a questionnaire survey of fishermen. As evidenced by a survey undertaken by Stacey *et al.* (1990), individual fishermen in British Columbia do not appear to perceive incidental mortality of small cetaceans as a serious management problem, possibly because the number of animals caught by any individual fishermen each year is fairly small. Thus a questionnaire survey has the potential to greatly increase our knowledge of the levels, species, and areas where incidental mortality occurs in the province.
4. Initiation of baseline boat- or air-based censuses in areas where potential habitat has been identified.
5. Monitoring of trends in these populations through repeated censuses between years.

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