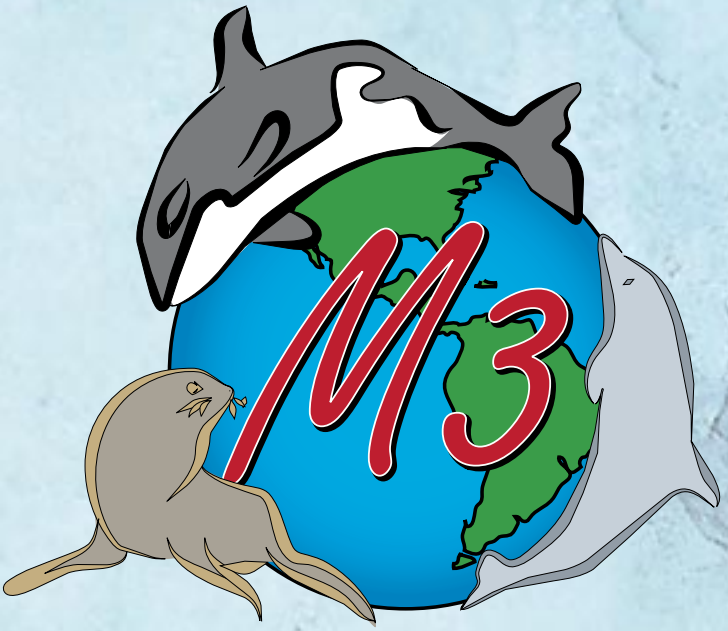

Marine Mammal Monitoring

Annual Report

2001 - 2002

The Marine Mammal Monitoring Project promotes stewardship of marine mammals, birds and critical habitat by providing a comprehensive outreach, education and monitoring program for recreational and commercial eco-tourists in the Salish Sea.

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Introduction

Figure 1: A vessel encounters a killer whale off southern Vancouver Island.

The waters of Canada's Pacific coast provide habitat for an extraordinary abundance and diversity of marine mammals and seabirds. Numerous opportunities to encounter marine wildlife have given rise to tremendous growth in recreational and commercial whale watch activities around southern Vancouver Island. However, marine wildlife has come under increasing threat from toxic contamination, declining fish stocks and high levels of engine noise from the vessels that accompany the animals on a daily basis.

The Committee on the Status of Endangered Species in Canada (COSEWIC) recently placed the southern resident population of north-eastern killer whales, or orcas (*Orcinus orca*), on its Endangered list. Mounting evidence suggests that the presence of vessels may disrupt the ability of these, and other marine mammals, to communicate with one another and to echo-locate their prey, and may elevate energy consumption by forcing avoidance behaviours. In the case of whales, a recent report concludes that "when there are large numbers of vessels, when some approach too closely, move too quickly, operate too noisily, or pursue animals, the completion of life processes in wild cetaceans may be disturbed."[1]

WHAT IS DISTURBANCE?

Regulations in Canada and the U.S. prohibit harassment and disturbance of marine wildlife. Disturbance is any interference with an animal's ability to hunt, feed, communicate, socialise, rest, breed and care for its young. Approaching too close or fast, pursuing an animal, or obstructing its path are all considered disturbance. Too many boats, excessive engine noise and exhaust fumes are also disruptive to nearby animals.

WHAT IS THE PRECAUTIONARY APPROACH?

The precautionary approach/principle is a distinctive approach to managing threats of serious or irreversible harm where there is scientific uncertainty. It is not new—what is new is the increasing complexity of the science and the public debate about the ability of governments to respond to such situations.

The precautionary approach recognises that the absence of full scientific certainty shall not be used as a reason to postpone decisions where there is a risk of serious or irreversible harm. Even though scientific information may be inconclusive, decisions have to be made to meet society's expectations that risks be addressed and living standards maintained.

From DFO website: www.dfo-mpo.gc.ca/cppa/HTML/ Pamphlet _e.htm

To date, few resources have been available to monitor whale watch activity in Canada's Pacific waters and research on the long-term impacts of marine mammal viewing is limited. The boating public remains largely unaware that their on-water presence can have a profound impact on the wildlife they encounter, while the commercial industry has grown exponentially over the past ten years, with an estimated value of USD $1,049 million world-wide, and USD $68.4 million in British Columbia.[2]

The Marine Mammal Monitoring Project (M3) was created in 2001 in an effort to address this situation. The project is modelled on the ***Soundwatch*** Boater Education Program on San Juan Island, and the Robson Bight (Michael Bigg) Ecological Reserve Warden Program in Johnstone Strait. Employing a precautionary approach (see box) to marine wildlife viewing activities, the project promotes marine conservation and stewardship, and gathers the most accurate, up-to-date information for resource managers, industry and the public. The following report details the first year of operations of this innovative pilot project which was made possible by funding from the Habitat Stewardship Program for Species at Risk and strong support from Fisheries and Oceans Canada and the Veins of Life Watershed Society.

[1] See Lien, John. 2001. The Conservation Basis for the Regulation of Whale Watching in Canada by the Department of Fisheries and Oceans: A Precautionary Approach. Canadian Technical Report of Fisheries and Aquatic Sciences 2363.

[2] See Hoyt, Erich. 2001. Whale Watching 2001: Worldwide tourism numbers, expenditures, and expanding socioeconomic benefits. Yarmouth Port, MA: International Fund for Animal Welfare.

A Partnership Initiative

M3 is a partnership initiative between Fisheries and Oceans Canada and the Veins of Life Watershed Society with principal funding from the federal Habitat Stewardship Program (HSP). HSP helps Canadians protect species and their habitats by enhancing existing, and encouraging new, conservation activities. These activities foster land and resource use practices that maintain habitat critical to the survival and recovery of identified species at risk and species of conservation concern.

HSP is partnership-based and is managed co-operatively by Environment Canada, Fisheries and Oceans Canada (DFO) and the Parks Canada Agency, and administered by Environment Canada. These departments design and fund the program in co-operation with non-federal government partners, who then implement projects through formal contribution agreements. Under these agreements, contributions are paid toward the costs of stewardship activities, and additional support is provided by matching resources or contributions in kind from project partners. Stewardship (see box) is a key component of these activities and HSP allocates funds to projects that implement the stewardship components of approved strategies for the recovery of species at risk.

WHAT IS STEWARDSHIP?

Stewardship refers to the wide range of voluntary actions that Canadians take to care for the environment. Activities range from monitoring and conserving wildlife species and the places where they live (their habitat), to protecting and improving the quality of soil, water, air and other natural resources. These types of conservation activities, particularly those that protect habitat, are essential to the recovery of species at risk. They are also instrumental in preventing other species from becoming at risk in the first place.

From Environment Canada website: www.speciesatrisk.gc.ca/species/sar/programs/index.htm).

Fisheries and Oceans Canada (DFO) is the federal agency responsible for the protection, conservation and management of marine mammals in Canadian waters. In the case of the endangered southern resident population of Pacific killer whales, DFO will begin the process of recovery plan design and implementation in 2003. Furthermore, DFO will undertake a process of public consultations for new marine mammal regulations under the federal Fisheries Act in the upcoming months. By supporting HSP, M3, and other projects such as the BC Cetacean Sightings Network in partnership with the Vancouver Aquarium Marine Science Centre, DFO demonstrates its commitment to the welfare and stewardship of marine mammals on the Pacific Coast.

The Veins of Life Watershed Society (VOLWS) has been engaged in community-based conservation and stewardship activities in and around Victoria, BC, since 1994. VOLWS focuses on a watershed-based approach, and initiates habitat restoration projects, stream cleanups, environmental education programs and public outreach activities. The goal of VOLWS is to establish a healthy and sustainable environment in which watersheds support fish and wildlife, and recreational use. Goals are achieved through consultation and co-operation with government agencies, businesses, local environmental groups and the public. One of its most note-worthy achievements has been to restore the waters of Victoria's Gorge waterway to swimming-quality. VOLWS' partnership role in the Marine Mammal Monitoring Project marks the launch of its Marine Division in which activities will focus the marine environment.

Location and Habitat

M3 operates in the trans-boundary marine ecosystem between southern Vancouver Island and north-western Washington state. This area is also known as the "Salish Sea", the traditional name given by First Nations to the combined waters of the Strait of Juan de Fuca, Puget Sound, and the Strait of Georgia. This area is described as a coastal temperate marine ecosystem, and provides habitat for a diverse range of species. Warm currents, rugged shorelines and the mixing waters from the Fraser River estuary, make the Southern Vancouver Island – Puget Sound area ideal habitat for several whale, porpoise, pinniped and seabird populations. The Trans-Boundary Area is inhabited nearly year-round by southern resident killer whales and populations of Dall's porpoise, harbour porpoise, and harbour seal. Other species such as grey whales, humpback whales, Minke whales, Steller and California sea lions, and northern elephant seals are found seasonally in the area as they migrate along the Pacific Coast.

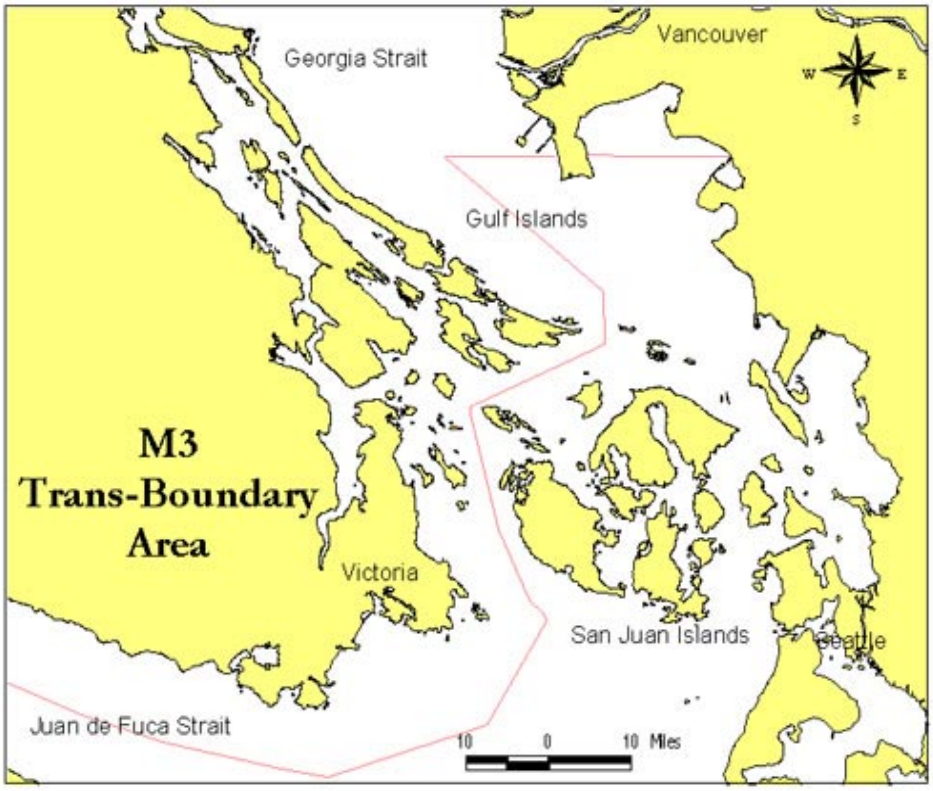

Figure 2: M3 area of operation between southern Vancouver Island and north-eastern Washington state.

Target Species

The M3 project targets all cetaceans, pinnipeds and sea birds that are subject to viewing activity in the southern Vancouver Island region. Several species have been listed by COSEWIC and are detailed in the following table:

Figure 3: Steller sea lions dive into the waters off southern Vancouver Island.

***Species Name* (common and Latin)**	***COSEWIC Status***	***Species Name* (common and Latin)**	***COSEWIC Status***
Killer Whale – Northeast Pacific southern resident population *Orcinus orca*	*Endangered* November 2001	Northern Elephant Seal *Mirounga aungustirostris*	*Not at Risk* April 1986
Killer Whale – Northeast Pacific northern resident population *Orcinus orca*	*Threatened* November 2001	Northern Fur Seal *Callorhinus ursinus*	*Not at Risk* April 1996
Killer Whale – Northeast Pacific transient population *Orcinus orca*	*Threatened* April 1999	Pacific Great Blue Heron *Ardea herodias fannini*	*Special Concern* April 1997
Killer Whale – Northeast Pacific offshore population *Orcinus orca*	*Special Concern* November 2001	Marbled Murrelet *Brachyramphus marmoratus*	*Threatened* November 2000
Humpback Whale *Megaptera novaeangliae*	*Threatened* April 1985	Ancient Murrelet *Synthliboramphus antiquus*	*Special Concern* April 1993
Grey Whale *Eshrichtius robustus*	*Not at Risk* April 1987	Double-crested Cormorant *Phalacrocorax auritus*	Local concern (not listed)
Harbour Porpoise *Phocoena phocoena*	*Data Deficient* April 1991	Western Grebe *Aechmophorus occidentalis*	Local concern (not listed)
Dall's Porpoise *Phocoenoides dalli*	*Not at Risk* April 1989	Harlequin Duck Histrionicus histrionicus	Local concern (not listed)
California Sea Lion *Zalophus californianus*	*Not at Risk* April 1987	Black Oyster Catcher Haematopus bachmani	Local concern (not listed)
Steller Sea Lion *Eumetopias jubatus*	*Not at Risk* April 1987		

Table 1: Species targeted by M3 and their COSEWIC status.

1. Develop guidelines for recreational vessels based on best practices through international collaborative process

Due to the intensity of whale watching activities around Victoria, M3 recognised considerable need for a succinct, easily understandable and widely-distributed set of guidelines, particularly for recreational boaters, accompanied by a comprehensive program of outreach and education. Existing guidelines for marine mammal viewing included ***Soundwatch*** Boater Education guidelines, Whale Watch Operators Association North West guidelines, Lifeforce guidelines, Saguenay/St. Lawrence Marine Park brochure, and those put out by DFO in its annual recreational fishing guides. In drafting new guidelines, many of these and other guidelines and best practices from Canada, the US and around the world were reviewed. A dialogue on guidelines with a spectrum of authorities and interests included:

- ***Soundwatch*** Boater Education Program
- Whale watch operators of Johnstone Strait
- Vancouver Aquarium Marine Science Centre
- Fisheries and Oceans Canada
- National Marine Fisheries Service
- Whalewatch Operators' Association Northwest
- Centre for Coastal Studies
- Canadian Marine Environmental Protection Society
- Parks Canada

The resulting information and guidelines were developed in consultation with the Friday Harbor Whale Museum, Vancouver Aquarium Marine Science Centre, DFO researchers, the DFO Pacific Marine Mammal Co-ordinator, the US National Marine Fisheries Service, and other researchers. Feedback was incorporated into a final document which was laid out in brochure format and printed in July, 2001.

The guidelines and brochure have been translated into French in preparation for the Vancouver Boat Show and meetings with industry and officials planned to coincide with the World Eco-tourism Summit to be held in Quebec. M3 will continue to facilitate dialogue nationally and internationally regarding a common approach to the establishment of guidelines for marine mammal viewing. DFO has expressed strong interest in using the guidelines as the basis for public consultations on the development of new marine mammal viewing regulations planned by Fisheries and Oceans Canada in the upcoming months.

2. Preparation of "Be Whale Wise" brochure

Figure 4: The "Be Whale Wise" brochure summarises international guidelines for viewing marine wildlife.

Based on the internationally-accepted guidelines the Marine Mammal Monitoring Project led the development of the "Be Whale Wise" brochure in principal collaboration with ***Soundwatch*** and others: DFO researchers and resource managers; US National Marine Fisheries Service the Friday Harbor Whale Museum, the Vancouver Aquarium Marine Science Centre. The brochure replaced the ***Soundwatch*** Boater Education wildlife viewing guidelines (U.S.), which M3 distributed at the beginning of the 2001 season. M3 and ***Soundwatch*** began distributing the "Be Whale Wise" brochure to boaters on the water midway through the summer 2001 season. 30,000 brochures were printed and ready for distribution on August 6, 2001. Two companion, poster-sized panels were developed as part of an M3 display booth featured at community events and presentations.

A second printing of the brochure is scheduled for 2002. The brochure will be slightly revised to incorporate feedback from further consultation. Guidelines will be developed to address behaviours specific to kayakers and special areas within the Trans-boundary Area which will be included as an insert. The US National Marine Fisheries Service and the Washington Department of Fish and Wildlife have expressed strong interest in distributing the brochure and in providing financial support for a second print run. The brochure will also be adapted to poster format for display at public boat launches, fuel docks and other appropriate venues.

3. Brochure Distribution

A total of 25,000 brochures have been distributed to boaters and the public through various means, including:

- on-water distribution by crew aboard the M3 and ***Soundwatch*** stewardship patrol vessels;
- mailouts of the Safe Boating Guide through the Canadian Coast Guard Office of Boating Safety;
- AquaNews, a public display set up at the Vancouver Aquarium Marine Science and AquaVan, a travelling outreach program that delivers marine education to schools throughout the Lower Mainland;
- the Friday Harbor Whale Museum at San Juan Island;
- posting of laminated versions at marine parks, boat launches and fuel docks in the San Juan Islands;
- all community events, local meetings, conferences and boat shows attended by M3 staff;
- marinas, sailing schools, charter companies, chandlers, and marine equipment stores throughout southern Vancouver Island and the Lower Mainland; DFO public information displays; and
- Canadian Power and Sail Squadron boating safety courses.

The brochure has generated a great deal of interest and positive feedback. Its colourful and eye-catching format have made it popular at distribution venues and have increased overall interest in the guidelines and the project.

In keeping with the aim to raise general awareness of marine stewardship issues in the trans-boundary area, M3 also distributed information to recreational boaters promoting other initiatives in the area. These were: the Orca Pass International Marine Stewardship Area initiative, which seeks to protect the trans-boundary marine ecosystem between BC and Washington; and the Turn Point Special Operating Area, a co-operative strategy by the Canadian and US Coast Guards designed to safeguard the environment and ships transiting the boundary waters of Haro Strait and Boundary Passage.

Figure 5: Crew aboard the M3 stewardship patrol vessel distribute guidelines and provide information to recreational boaters.

Brochure distribution is continuing throughout the winter and spring seasons as staff continue to participate in community events and attend various meetings. Existing venues for distribution will be evaluated and new opportunities sought.

4. Attendance at community events/Presentations to various organisations

M3 staff have made a number of presentations to local community groups and meetings. Staff from the M3 and Veins of Life Watershed Society have also attended a number of community events to distribute the "Be Whale Wise" brochure and provide information to the public about the project and marine mammal viewing guidelines. At a number of events, the M3 stewardship patrol vessel was displayed along with the poster-sized version of the brochure. M3 has been represented at the following events:

Event	Date	Type of Participation	Attendance
Annual Gorge Gala and Times-Colonist SwimFest, Victoria	July 7,2001	Display with stewardship patrol vessel	500
Rootsfest annual music festival, Victoria	July 27-29, 2001	Display with stewardship patrol vessel	10,000
Victoria Classic Boat Festival	August 31-September 2, 2001	Display with stewardship patrol vessel	2000
Georgia Strait Alliance presentation of Dr. Peter Ross on toxins and resident orcas	October 24, 2001	Staff present with brochure	40
Living Oceans Society MPA Power Tools Conference	October 19, 2001	Staff present with brochure	250
Kayak Guides Alliance Annual Meeting, North Pender Island	October 26, 2001	Presentation	15
Central Saanich Chamber of Commerce annual auction	October 26, 2001	Presentation, display with stewardship patrol vessel	300
US National Oceanic and Atmospheric Administration Marine Mammal Viewing Workshop, Vancouver	November 28, 2001	Presentation	225
14th Biennial Conference on the Biology of Marine Mammals Vancouver	November 29, 2001	Booth with poster display	1800
Royal BC Museum Marine Weekend	November 23-24, 2001	Booth with poster display	2500
Victoria Capitol Region District Round Table on the Environment meeting	January 21, 2002	Presentation	25
Pacific Biological Station Open House	February 5-10, 2002	Staff on hand with brochures	17,000
2002 Vancouver International Boat Show	February 6-10, 2002	Booth with poster display	37,000
Trans-boundary/Orca Pass Marine Protected Area Initiative meeting	February 13, 2002	Presentation	25
Victoria Boat and Outdoor Show	March 1-3, 2002	Booth with poster display	1700
		Total	73,380

Table 2: Community events, meetings and conferences attended by M3 staff.

In addition to community events, M3 reached a large audience of professionals and students in the field of marine mammal research and conservation with its participation at a major international marine mammal viewing workshop and cetacean conference. M3 staff attended, and hosted a booth at, the 14th Biennial Conference on the Biology of Marine Mammals in Vancouver, from November 29th to December 3rd, 2001. The display generated considerable interest from conference attendees and staff were on hand to distribute "Be Whale Wise" brochures.

Figure 6: M3 staff with display at the Victoria Boat Show.

M3 also had the opportunity to showcase its efforts at the pre-conference workshop, Viewing Marine Mammals in the Wild: A Workshop to Discuss Responsible Guidelines and Regulations for Minimizing Disturbance. Project manager, Marc Pakenham, presented the guidelines and reported on M3 activities and findings from its first season of operation. The presentation was well-received and the guidelines were highlighted during the discussion portion of the workshop.

Further interest in the project was manifest at the Vancouver International Boat Show where several charter companies, boating schools, and marinas expressed keen interest in having the brochure available for their clients. The public were very supportive of the guidelines and the project, and expressed awareness and concern over the nature and extent of whale watching activities in the area.

Staff will continue to represent M3 at a variety of upcoming events. Most recently, M3 represented trans-boundary marine mammal viewing interests at the Cruise Ship Stewardship Initiative Roundtable meeting hosted by Oceans Blue Foundation in Vancouver on March 18, 2001. Presentations are planned for the following groups: the BC Ferries Corporation, Canadian Coast Guard helicopter pilots, the Victoria Clipper, Washington State Ferries, Helijet, Department of National Defence operations, and local aviation companies. Plans are also underway to participate in the World Ecotourism Summit to be held in Quebec City in May, in support of the United Nations International Year of Ecotourism (2002), and at Coastal Zone Canada in June. Further opportunities for participation in events at the local level will be explored.

5. Website Development

M3's website has been active since July and is situated within the Salish Sea website developed by VOLWS as part of their new marine division. Members of the British Columbia E-team Crew developed M3 web pages that include general information about the project, a downloadable PDF version of the "Be Whale Wise" brochure, weekly journal summaries of project activities and related links. The Salish Sea website has had 221 hits to date, and a dedicated visitor counter has recently been added to the M3 home page.

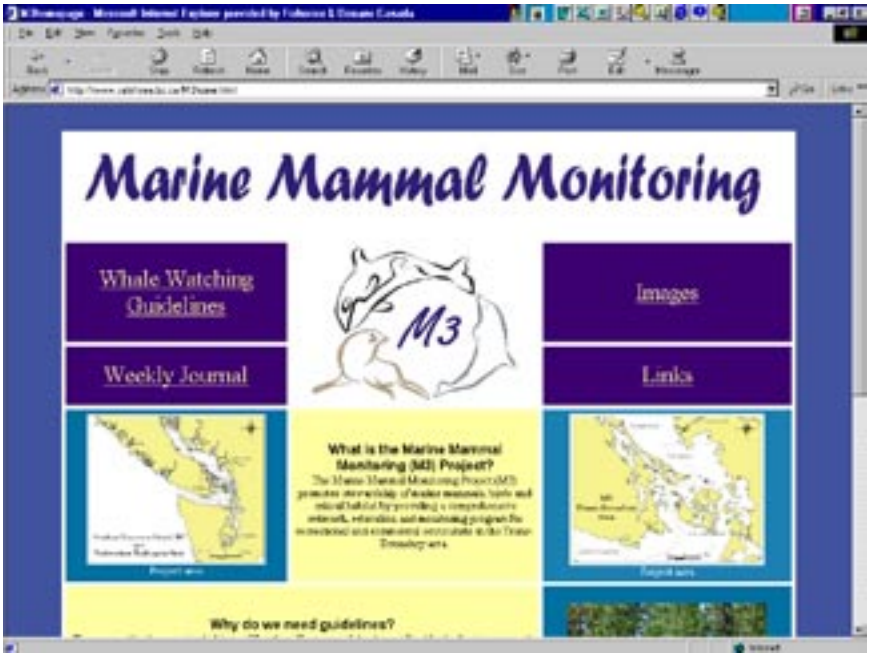

Figure 7: The M3 website at www.salishsea.ca

M3 plans to explore internet technology as a monitoring tool, and as a means of facilitating greater volunteer involvement in monitoring and analysis of vessel behaviour with the assistance of digital video. Further work will be done towards providing streaming video footage of whale watching activities and the potential for live video feeds of monitoring activities. These technological applications are new and have proved challenging during the first year and M3 looks forward to collaborating with its partners to further develop these methods.

6. Collaboration with *Soundwatch*

Collaboration on monitoring and outreach with the Friday Harbor Whale Museum's ***Soundwatch*** Boater Education Program based on San Juan Island, Washington, has achieved a high degree of success. Collaborative efforts included training of M3 crew in observation and recording techniques using standardised log sheets, co-ordination of on-water activities during the 2001 season, post-season analysis of data, compilation of a common database, and co-operation on presentations given at Viewing Marine Mammals in the Wild: A Workshop to Discuss Responsible Guidelines and Regulations for Minimizing Disturbance, sponsored by the US National Oceanic and Atmospheric Administration and held in Vancouver on November 27th, 2001.

While on the water, daily co-ordination between program staff ensured the most effective use of stewardship patrol vessels and a high degree of contact with recreational vessel operators. ***Soundwatch*** distributed "Be Whale Wise" brochures and posted laminated versions at marine parks, boat launches and fuel docks throughout the San Juan Islands.

Merging of the M3 and ***Soundwatch*** databases to create a meta-database is proposed for the 2002 season. Evaluation of monitoring activities by the two programs will inform planning for more efficient vessel use during the next season and more streamlined evaluation of boater compliance with guidelines. The final report for ***Soundwatch*** activities in 2001 will be made available on the ***Soundwatch*** website at www.whale-museum.org/swpage/swhome.html in the near future.

Figure 8: The Soundwatch Boater Education Program has been operating since 1993.

7. Volunteer Involvement

There has been considerable volunteer interest in the project and the development of volunteer resources remains a high priority for M3. The staff and students at Lester B. Pearson College of the Pacific, including the eco-wardens at Race Rocks, have been actively involved in volunteer monitoring efforts in the Race Rocks Ecological Reserve-Marine Protected Area.

A number of individual volunteers were recruited for the 2001 season to assist with on-water operations. Along M3 crew, some volunteers received training in the following areas:

- vessel familiarisation and maintenance
- marine mammal identification
- guidelines international guidelines and regulations/legislation
- WWOA-NW
- boating safety and crew responsibilities
- DFO enforcement requirements and challenges
- marine mammal toxicology study results
- navigation/local area knowledge
- search and rescue skills: search patterns, log-keeping
- data collection and incident reporting

Volunteer participation aboard the M3 vessel was suspended in August, pending completion of a risk management plan. During this time a number of eligible employees from the Canadian Coast Guard volunteered their time.

Volunteers will continue to form an integral part of the project and are essential to its stewardship mandate, particularly as the provincially-sponsored E-teams, which contributed staff to the project, were discontinued at the end of 2001. M3 will continue to work with Pearson College staff and a spectrum of partners to consolidate marine mammal monitoring protocols. Additional water and land-based volunteer projects will be developed in the off-season for public outreach, and planning for on-water activities. There has also been a great deal of interest from shore-based volunteers, such as waterfront property owners and several residents of Saturna Island, who have offered to participate in a more formalised relationship with the M3 and ***Soundwatch*** programs. In 2002, it is hoped that the project will provide the necessary resources and training to mobilise these interests.

8. Monitor vessel behaviour and conduct vessel surveys and in the vicinity of whales

Figure 9: M3 crew and volunteers aboard the M3 stewardship patrol vessel monitor whale watching activities in the waters off southern Vancouver Island.

M3 sought to maintain an on-water presence throughout the whale watching season from June to September, especially during peak whale watching hours. In its first year, the stewardship patrol vessel operated between June 15 and October 13, 2001, with a brief suspension of activity between August 10 and September 7 due to delays in the receipt and processing of HSP funds. On-water stewardship activities focused on a number of areas. The first was the observation and recording of vessel behaviour and numbers around marine mammals in order to provide an accurate characterisation of current whale watching effort. The second function was to provide outreach and education directly to recreational boaters by approaching them directly on the water and engaging a "friendly intervention" approach whenever undesirable behaviours were observed. Finally, M3 crew provided cetacean sighting information in support of the BC Cetacean Sightings Network, another HSP-funded program engaged in the conservation of marine species at risk.

Crew members gathered information on the water through the observation of commercial and recreational vessels operating in the vicinity of marine mammals. Range finders and binoculars were used to increase the accuracy of observations with photographs and video taken whenever possible. Logged information included regular vessel counts, incident reports, i.e., activities that did not comply with established guidelines and area-specific legislation, a general description of viewing activities, and all contact with recreational and commercial vessels. These activities are summarised in Table 3.

Survey	Description
Vessel Count	Every thirty minutes, on the hour and at half-past, a survey of vessels in the vicinity of marine mammals is taken. Vessels are counted and classified by type, such as recreational, commercial, kayak, shipping, research, and other (e.g. planes). Vessels transiting the area that could potentially view, or have and encounter with, a marine mammal are included in the survey.
Incidents	To monitor vessel compliance with applicable guidelines, vessel behaviour is assessed against the "Be Whale Wise" guidelines, the WWOA-NW Guidelines, the federal Fisheries Act, and the US Marine Mammal Protection Act. "Incidents" are activities that fail to comply with these measures. If a violation of one or more guidelines is observed, the identity of the vessel and the nature of the violation are recorded in detail. Incidents are reported to the operators or companies involved.
Whale Watching Characterisation	The overall whale watching scene is detailed at the same intervals as vessel counts. The marine mammal species present, behaviour characterisation, direction of travel, behaviour of nearby vessels, weather and location are all considered. This qualitative information helps to understand the complexities of the scene in support of the vessel counts and incident records.
BC Cetacean Sightings Network Log	The Vancouver Aquarium Marine Science Centre and the Department of Fisheries and Oceans have developed a cetacean sighting network. This HSP-funded project aims to create a network of individuals voluntarily reporting the location of cetaceans along the Pacific coast of BC. The habitat use of many species of cetaceans is unknown, especially during winter months. To help in this endeavour, the M3 project recorded all sightings of cetaceans and submitted the data at the end of the season.
Vessel Contact	All contact with recreational and commercial vessels is logged. Vessel identification is recorded where possible along with time, location, guideline distribution and additional comments. This information facilitates the evaluation of M3's outreach efforts while on the water.

Table 3: Description of specific M3 monitoring activities.

M3 will continue to refine and develop its on-water monitoring and outreach activities in the 2002 season. The use of an aerial survey platform as an innovative monitoring tool will be explored and incorporated into current monitoring protocols. The use of digital video recording will also be integrated as an assessment tool. Additional monitoring technologies will be developed in partnership with Dr. David Bain, from the University of Washington, to examine acoustic impacts of vessels on whales. Streaming video links are also planned for the M3 website to provide access to researchers and the public, and further engage volunteers in observation and analytical processes. Work is also planned with the research and fishing communities to better understand the nature of the acoustic environment of orcas and salmon.

9. Compilation of incident reports and vessel survey data into database

All information gathered in the first season was entered into a Microsoft Access database. The database was modelled on that of ***Soundwatch*** which provided assistance and training to M3 staff in its set up and use. The conformity of M3 and ***Soundwatch*** data allowed for joint analysis of data and the corroboration of results. The database was used to generate individual non-compliance "report cards" for commercial whale watch operators to facilitate best operational practices within industry. Each company was provided with details of incidents in which its vessels were observed, in addition to a general summary of all commercial incidents observed by M3 during the given time period. Three sets of feedback reports were distributed via e-mail in July, August and October, 2001.

Further analysis during the off-season will allow M3 to modify future monitoring and outreach activities based on information gathered during the first season of operation. This forms an essential element in the evaluation and creation of effective strategies for stewardship, and provides baseline data against which future compliance monitoring will be measured. The effectiveness of the "report card" feedback is currently being reviewed. The Whale Watch Operators Association Northwest has expressed support for the continuation of feedback reporting, citing the report cards as useful tools for staff evaluation and incentive.

10. Document marine mammal sightings

M3 supported the activities of BC Cetacean Sightings Network (BCCSN), an HSP-funded initiative between the Vancouver Aquarium Marine Science Centre and DFO. Observations of cetaceans and their behaviour were recorded in a logbook supplied by the network and copies of entries were forwarded on a regular basis. Conversely, the BCCSN has been active in distributing "Be Whale Wise" brochures with BC Cetacean Sightings Network logbooks.

M3 will continue to submit logged sighting information to the BCCSN. M3 will make use of all available outreach and educational opportunities to promote the BCCSN and will encourage its partners to support the project. This will include such groups as Coast Guard helicopter pilots, Canadian Power and Sail Squadrons and other groups whose membership engages in related activities.

11. Work co-operatively with government and non-government organisations to address related conservation and vessel safety issues

In its first year of operation, M3 partnered with the following organisations:

- Fisheries and Oceans Canada
- Veins of Life Watershed Society
- Environment Canada Habitat Stewardship Program
- ***Soundwatch*** Boater Education Program
- British Columbia Ministry of Environment, Lands and Parks (E-team)
- Vancouver Aquarium Marine Science Centre
- BC Cetacean Sightings Network
- Lester B. Pearson College of the Pacific

Additional local groups that provided assistance included the Central Saanich Chamber of Commerce, the Oak Bay Marina, the Canadian Coast Guard Office of Boating Safety and Canadian Power and Sail Squadron.

M3 will continue to work towards building partnerships with the range of agencies promoting marine conservation and stewardship in the trans-boundary waters, in Canada, and elsewhere in the world. M3 has been asked to participate in the Commission for Environmental Co-operation project, Sustainable Whale-Watching in the Baja to Bearing (B2B) Region. The project complements other national and regional initiatives including the Habitat Stewardship Program, the proposed Species at Risk Act, the BC Cetacean Sightings Network, the Pacific Marine Heritage Legacy (PMHL), the Pacific Marine Mammal Advisory Council (PMMAC), the Georgia Basin Ecosystem Initiative (GBEI), the Orca Pass International Stewardship Initiative, Robson Bight (Michael Bigg) Ecological Reserve Warden Program, the Baja California to Bering Sea Initiative, Marine Protected Areas, National Marine Conservation Areas, Integrated Coastal Zone Management, the US Endangered Species Act, international efforts to protect endangered species, and the UN International Year of Eco-tourism.

RESULTS FROM M3 MONITORING ACTIVITIES 2001

The primary focus of M3's monitoring activities is to characterise the whale watching activities of commercial, recreational and other vessels while in the vicinity of whales, and to observe and record the behaviour of vessels on scene. To do so, a range of behaviours contrary to voluntary guidelines has been identified over the years by the ***Soundwatch*** Boater Education Program. Incidents of non-compliance have been categorised by "Type of Behaviour" in order to readily identify the nature of the incident and provide an opportunity for analysis and reporting to commercial whale watch operators and the public. During M3's first monitoring season, a total of 88 incidents in which vessels did not comply with voluntary guidelines were observed. A summary of these are presented in the table opposite.

Behaviour	Comments	% of Incidents 2001
Under power within 100 metres of whales	Proximity and associated engine noise may have negative impacts upon cetaceans' ability to communicate and locate prey. *M3* suggests that engines should be shut off even if the vessel plans to remain stationary, to reduce confounding engine noise.	14%
Parked in the path	The area ahead of a cetacean is critical to its ability to communicate, echolocate and hunt. Vessels positioning themselves in the path of the animals may force them to alter course or dive in avoidance, in turn leading to additional stress and energy consumption. While sanctioned by the WWOANW guidelines, this behaviour is discouraged in the "Be Whale Wise" guidelines. *M3* recommends that boaters to make every effort to remain well out of the path of the whales.	9%
Crossing the path of whales	This activity may be the result of intended repositioning for a better view or the simple act of transiting an area, however manoeuvring a vessel to cross ahead of the path of whales is potentially dangerous and very disruptive.	1%
Repositioning to be within 100 metres of whales	Vessel operators waiting for whales to travel in their direction may reposition their vessel in such a manner that whales will pass within 100 metres. Whales are known to change their travelling behaviour and surface at unexpected locations therefore it is important to limit the amount of vessel movement around and ahead of whales. "*Be Whale Wise*" guidelines discourage vessels from being within 100 metres of a marine mammal.	2%
Leapfrogging	*Leapfrogging* involves the repositioning of a vessel ahead of whales in anticipation of a subsequent pass. When the vessel moves to reposition, it is done at relatively close proximity to an animal and is often perceived as interfering with its path. Leapfrogging is prohibited in both the *M3*/***Soundwatch*** and WWOANOW guidelines.	15%
Chasing or pursuing whales	This occurs when a vessel operator chooses a course of travel adjacent to, or close behind, a marine mammal. This chasing behaviour is highly undesirable and may constitute harassment, enforceable under the Marine Mammal Regulations of the Fisheries Act and the US Marine Mammal Protection Act.	1%
Inshore of whales	Whales must be allowed sufficient space and access to the special near-shore habitats where they forage for food. Positioning vessels between a whale, or group of whales, and the neighbouring shoreline is prohibited for both commercial and recreational vessels.	14%
Within 100 metres of shore within a Marine Protected Area	The Race Rocks Marine Protected Area has special guidelines for operation within its boundaries. Maintaining a 100-metre distance from land, especially haulouts and bird colonies, is advised. Within the MPA, the current is swift and the close proximity of rocky islets to one another creates narrow channels. Operators must make every effort to travel mid -channel to reduce disturbance.	13%
Within 100 metres of an Ecological Reserve	As in MPAs, boaters must maintain a 100-metre distance from provincially designated Ecological Reserves. The seabird colonies located on Great Chain Islets are popular bird viewing locations.	2%
Within 440 yards of the San Juan Island No-Boat Zone	To allow whales uninterrupted access to the near-shore habitats along the entire west coast of San Juan Island, San Juan County has established a voluntary no-motorboat zone whenever whales are present.	17%
Within 880 yards of Limekiln Park	Limekiln County Park is a popular land-based whale watching site. A voluntary no-motorboat zone has been established within 880 yards of the lighthouse to facilitate shore-based viewing. Commercial vessels tend to stay well outside the no-boat zone as stipulated in the WWOANW guidelines therefore *M3* focused its efforts on outreach in this zone.	n/a
Aircraft within 1000 feet of whales	Floatplanes, helicopters and small take advantage often take advantage of opportunities to view whales. In the U.S. and Canada regulations require aircraft maintain a minimum altitude of 1000 feet above marine mammals. Engine noise from aircraft adds to already high levels of noise pollution from vessels and may present safety hazards.	10%
Other	This includes additional undesirable behaviours such as failing to approach whales from a parallel direction or operating vessels at high, and often unsafe, speeds near whales.	2%

Table 4: Description and distribution of incidents of non-compliance with voluntary marine viewing guidelines.

Observations of Vessel Numbers and Types within the Vicinity of Whales

In terms of overall viewing activities, 64.6% of the vessels observed within the vicinity of whales were operated by commercial whale watch operators. M3 documented 38 active American and Canadian whale watch companies operating a total of 71 vessels.

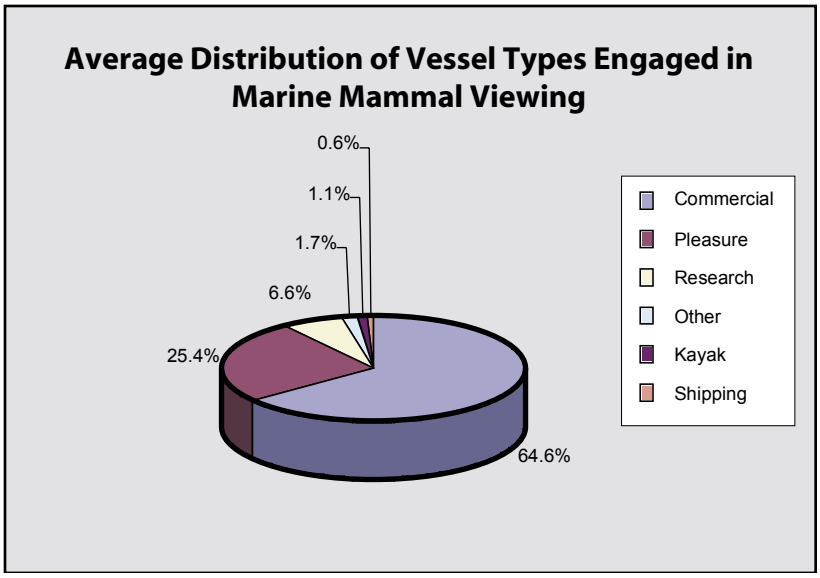

Figure 10: Average distribution of marine mammal viewing vessels by type.

"Active" status applies to operations with vessels that departed with the intent of whale watching at least once per week between June and September. Many companies, especially in Canada, operate more than one vessel and run two or more trips per day, seven days per week. During the peak season, daily commercial operations typically ran from 09h00 to 21h00 in a range of weather conditions.

Pleasure craft represented 25.4% of vessels observed. These ranged from small aluminum fishing skiffs and sailing vessels to large power yachts. Overall observations indicated that the majority of recreational vessel travel took place between late morning and mid-afternoon, and generally when sea conditions were favourable. Kayaks, research vessels, shipping traffic and aircraft comprise the remaining 10% of vessels observed within the vicinity of whales.

The Trans-boundary Area experiences a high concentration of shipping traffic. Ferries, freighters, and tugs are often seen passing by a grouping of marine mammals. Float planes, helicopters and private aircraft are seen occasionally above a group of animals, engaging in opportunistic whale watching opportunities.

Daily Distribution of Whale Watching

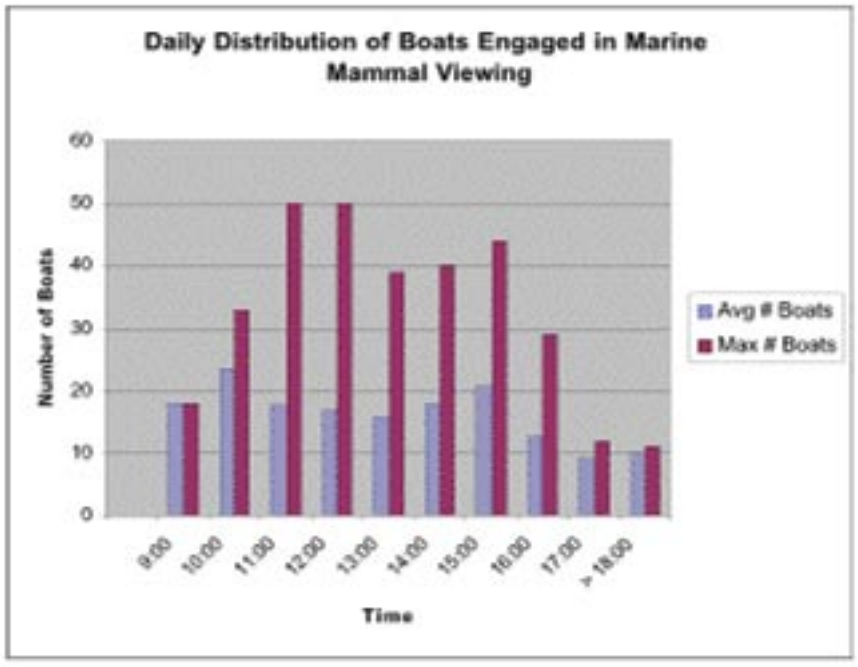

Figure 11: Observed hourly maximum and average number of vessels in the vicinity of marine mammals.

During the monitoring period between June 15 and October 13, 2001, vessel counts taken every half hour indicate that the average number of vessels actively viewing marine mammals at any given time was 18, with a maximum of 50 vessels observed at one time. Factors affecting the intensity of viewing activity included seasonal variability, weather, marine mammal travel patterns, time of day, and proximity of whales to shore and populated areas. Periods of greatest traffic density peaked during late morning and mid-afternoon. The data indicate that whales were accompanied by large numbers of vessels throughout the day. The absence of information from the evening hours reflects the operating times of the M3 patrol vessel.

Spatial Distribution of Whale Watching

Popular whale watching locales have been identified through data analysis. The highest vessel counts were recorded near shore, most likely due to greater accessibility for pleasure craft and kayaks, and the proximity to populated areas or highly frequented fishing grounds. The most popular whale watching locations occur along the west side of San Juan Island (especially near Limekiln Point), between Race Rocks and Sooke, and between Turn Point and East Point. The popularity of viewing activities in these areas likely results from inshore habitat use by resident killer whales.

Observed compliance with WWOANW and International Guidelines

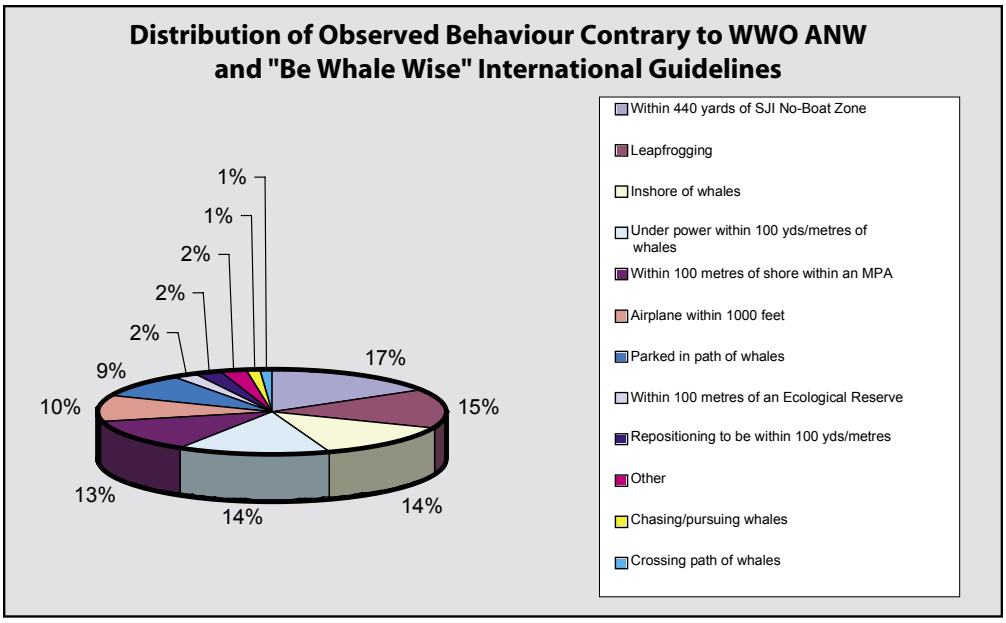

Figure 12: Distribution of observed violations to WWOANW and international guidelines by commercial and recreational vessels in the Trans-boundary Area (M3, 2001).

Both commercial and recreational vessels were monitored for compliance with either the WWOANW guidelines or the international guidelines published in the "Be Whale Wise" brochure. Vessel operators are faced with many decisions with regard to marine mammal viewing positioning. In efforts to reduce engine noise, vessels often shut down and drift with the currents, and may consequently find themselves inshore of whales or within no-boat zones. Additionally, operators who unintentionally find themselves in the path of whales are faced with the dilemma of starting their engines to move away, thereby creating underwater noise, or to leaving their engines off and allowing the animals pass underneath or around. In this circumstance, operators then find themselves within 100 metres of the whales.

Spatial Distribution of Non-compliance

The majority of incidents were observed on the West Side of San Juan Island (Limekiln Pt and False Bay) and near Sooke (Race Rocks and Becher Bay). These locations are historically popular whale watching locations and are in close proximity to shore. In these areas, vessels often cluster to the offshore side of whales to optimise viewing potential. However, they are limited in space and manoeuvrability as they jockey for position. Conversely, in offshore areas, boats have considerably more area in which to manoeuvre and often situate themselves at greater distances from other boats and whales.

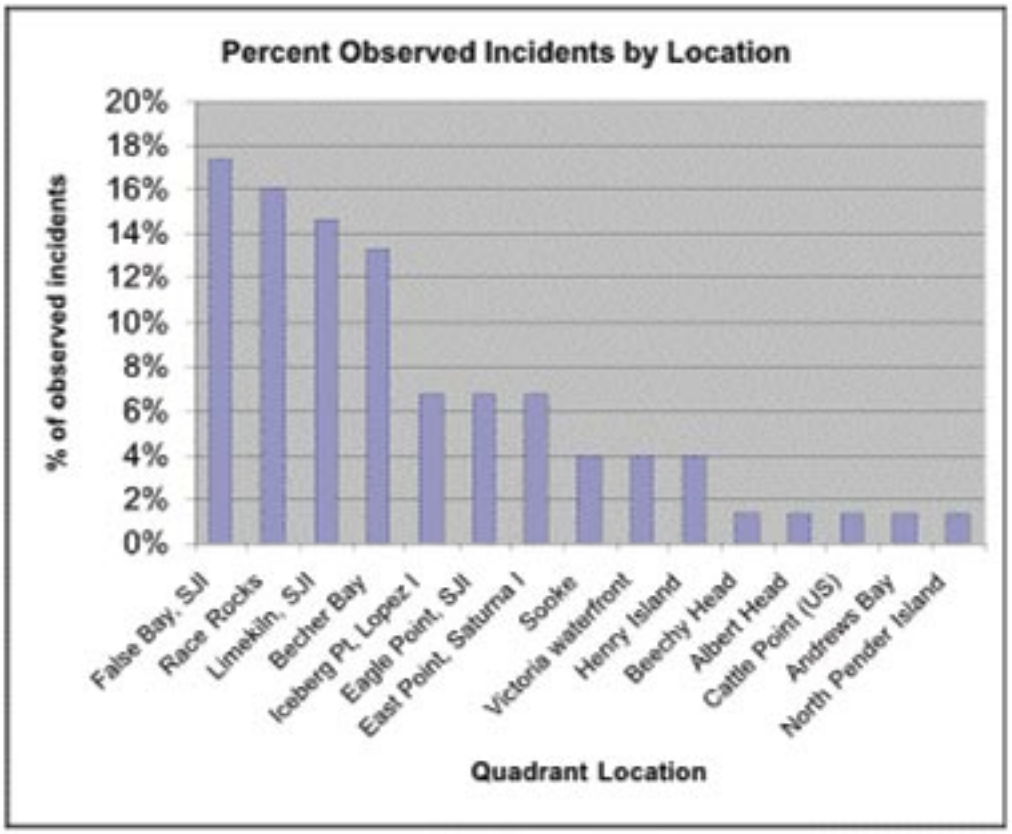

Figure 13: Locations of observed non-compliance with WWOANW and international guidelines.

Monitoring vessel behaviour in the vicinity of whales according to voluntary guidelines is extremely complex. Using the stewardship patrol vessel as the primary monitoring platform, M3 utilised range finders, binoculars, significant discussion between crew members, and co-ordination with ***Soundwatch*** to ensure objectivity and accuracy of reporting. Some of the limitations of current methods include the inability to determine the dynamics of vessels when the M3 stewardship patrol vessel is not present on-scene. Acknowledging the limitations of current monitoring protocols, M3 is working towards refining and developing monitoring methodologies that will include aerial and shore-based observation, the use of radar technology and digital video. M3 will work closely with ***Soundwatch*** to co-ordinate the best possible coverage and most accurate observations and reporting.

ACCOMPLISHMENTS, EVALUATION AND RECOMMENDATIONS

Summary of Significant Measurable Project Results

Program Outreach and Extension

Spearheading an international program in Southern BC and adjacent U.S. waters, the Marine Mammal Monitoring Project (M3) has two major functions:

- to monitor commercial and recreational marine mammal viewing activities, and
- to develop a community stewardship program by providing comprehensive education and outreach activities in order to raise awareness of marine conservation issues and species at risk.

The principal accomplishments of the M3 project have been:

1. Monitoring marine mammal and bird viewing in the Trans-boundary Area, an activity which had not previously been provided in BC.
2. Developing and delivering an outreach/education program based on internationally-supported guidelines.
3. Creating liaison, significant partnerships and co-ordination at all levels of government, non-government, scientific, research, eco-tourism industry, recreational boating and general public.
4. Developing a volunteer network to support the continuation of activities.

Evaluating Project Effectiveness

The Marine Mammal Monitoring Project has met or surpassed its project goals for 2001. For many of these activities, work is on-going and is being incorporated into project planning and funding proposals for 2002. Major achievements include:

- developing bi-laterally endorsed guidelines;
- production and targeted distribution of 30,000 "Be Whale Wise" brochures;
- first Canadian marine mammal monitoring project in the Salish Sea;
- development of a comprehensive outreach and education program;
- high level of international co-operation, partnership and co-ordination; and
- fostering of healthy habitat for species at risk – endangered and threatened mammals and seabirds.

Recommendations for Future Stewardship/Conservation Activities

The M3 project applies a phased approach to its stewardship program with a range of deliverables over the next few years. Activities commencing in 2001 will undergo further development and implementation as reflected in this report. To optimise achievements, M3 activities respond to feedback and evaluation and incorporate new ideas and resulting recommendations, in order to be relevant and proactive. M3 has forged significant partnerships and relationships in its first year that auger well for the future. Furthermore, there is a current "tsunami" of public interest in the plight of killer whales. M3 activities are well timed and situated to expand and transform this interest into effective strategies for stewardship and to provide support for Species at Risk and DFO recovery planning.

"Fascinating, aren't they?"

ACKNOWLEDGEMENTS

M3 wishes to thank the following individuals and groups for their contributions and efforts toward making the project a success in its first year.

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The volunteers that assisted with the project throughout the season.
Local whale watch vessel operators.

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