

The Evolution of Adaptive Management Practices for Vessel-based Wildlife Viewing in the Boundary Waters of British Columbia and Washington State. From Voluntary Guidelines to Regulations?

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Abstract:

Killer whale (*Orcinus orca*) watching in the Salish Sea began in 1984. It has since grown into a year-round, large recreational and commercial industry pursuing a variety of marine wildlife species.

Currently, there are no federal marine wildlife viewing regulations in the U.S. or Canada. Instead, both agencies recommend guidelines. In 1988 an adaptive management process of generating “voluntary” best practices was initiated through: 1) semi-annual stakeholder meetings, 2) the formation of a U.S./Canadian industry association, and 3) a program of on-the-water education and monitoring. Best practices included vessel operation and location restrictions and were regularly improved by stakeholders. Compliance was implemented through promotion of best practices and vessel patrols. In 2002, the commercial operators and federal governments adopted a uniform set of best practices known as Be Whale Wise.

The southern resident population of killer whales is now listed as endangered in Canada and the state of Washington, and under review for threatened at the U.S. federal level. Listing status has prompted the creation of federal recovery plans with considerations for vessel traffic management. What remains to be seen is how community generated best practices and adaptive management will co-exist with federal and state mandates for regulatory solutions.

INTRODUCTION

Vessel-based killer whale (*Orcinus orca*) watching in the Salish Sea began as a targeted practice by charter operators and a few private boaters in 1984. It has since grown into a year-round industry pursuing a variety of species in addition to killer whales. Presently there are no regulations in the U.S. or Canada to manage vessel-based wildlife viewing instead both agencies recommend guidelines. In 1988 The Whale Museum initiated a community-based adaptive management process for generating voluntary best practices for wildlife viewing that supported and enhanced the federal guidelines of both countries. Out of this effort an adaptive management annual cycle was established with local stakeholders, which has most recently culminated in the adoption of a uniform set of best practices endorsed by the federal governments of both the U.S. and Canada. In what follows the history of this community-based adaptive management process is described and recommendations are made on how to maintain it into the future now that the “community” has been expanded to the level of national interests.



Figure 1. Study Area (Graphic: Courtesy Puget Sound Action Team).

Study Area

The focus area for this study is the north central Salish Sea: the boundary waters of the Canadian Gulf and San Juan Islands, located in northwestern Washington State and southwestern British Columbia in the Puget Sound/Georgia Basin. The Salish Sea includes Puget Sound and the Straits of Georgia and Juan de Fuca. It is the traditional homeland of the Coast Salish peoples.

Adaptive Management Model

Vessel-based whale watch management in the boundary waters of the Salish Sea evolved through a process of community-based self-regulation that has been implemented using an adaptive management approach. Adaptive management has been defined and interpreted in a variety of different ways (Holling, 1978; Walters, 1986; Mitchell, 1989; Allen and Hoekstra, 1992). A definition that emerged from a discussion at the *Taking Stock Workshop*:

Implementing Adaptive Management, in 2000 in St. Paul, MN, defined adaptive management as “rational, data driven objective-based management that links research and management to their mutual benefit. It is a process of questioning existing assumptions, exploring alternative ones, envisioning potential scenarios for management, experimenting with solutions, and monitoring the uncertain outcomes to refine actions. Adaptive management is the integration of research and management to affect policy through feedback and decision-making, using the observed results of the experiments to design, develop and implement future experiments”(www.adaptivemanagement.net).

Vessel-based whale watch management in the Salish Sea has followed this type of an adaptive management approach through the use of stake-holder initiated voluntary guidelines that are annually monitored and updated to meet current conditions (Figure 2). Critical to this process is the annual cycle of development, distribution, evaluation and adjustment of current best boating practices. The primary way this is accomplished is through the operation of Soundwatch educational patrol vessels in the boundary region of the San Juan and Gulf Islands. The vessel patrols conduct on-the-water education with boaters and collect field data on vessel activities in marine wildlife viewing areas. This data allows Soundwatch staff to characterize regional marine wildlife viewing trends, provide its findings to regional managers and user groups and to adjust guidelines as necessary.

HISTORY

Over the past decade, worldwide whale watch activities have grown into a billion dollar (\$USD) industry involving over 80 countries and territories and over 9 million participants (Hoyt, 2001). The Canadian/U.S. boundary waters of the Salish Sea have been no exception, often cited as one of the fastest growing whale watch areas in the world. Killer whale (*Orcinus orca*) watching in the Salish Sea is currently a multi-million dollar industry, engaging over 500,000 people annually in whale watch activities from shore, commercial and private boats, kayaks and aircraft (Koski, 2005).

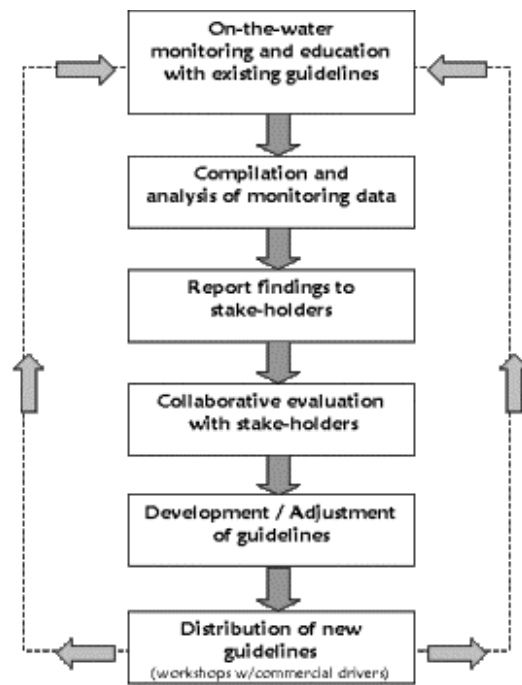


Figure 2. Adaptive Management Model

Whale Watching Trends

Prior to 1976 whale watching in this region was virtually non-existent. Then, from 1984 through 1998 it exhibited nearly continuous annual growth in the mean number of commercial companies and numbers of vessels accompanying whales. The retail sale of orca watching tickets in this region began in the late 1970s, but did not gross over \$10,000 in estimated ticket sales annually until 1985. By 1991 ticket sales broke \$1 million and by the end of the 1997 season they approached \$5.7 million, with 81 commercial boats from both sides of the border carrying over 250,000 passengers (Osborne, 1999). Shore-based whale watching at Lime Kiln Point/Whale Watch State Park steadily increased from the park dedication in 1984 through 1996. Since then, visitors to the park have maintained steady at nearly 200,000 visitors annually (Washington State Parks).

Currently there are 73 active commercial whale watch vessels originating from 39 commercial companies in U.S. and Canadian ports surrounding the study area (Figure 3). Commercial vessels vary in size from small, open boats around 20ft. carrying just over a dozen passengers to large vessels over 150ft. carrying over 250 passengers. Most U.S. vessels are large, slow passenger style vessels making one to two trips daily. Canadian vessels are primarily open, high-speed vessels sometimes making up to four trips a day. The number of U.S. and Canadian companies are nearly the same with 20 Canadian and 19 U.S. companies respectively. However, there has been a shift in the industry towards more Canadian vessels. Canadian vessels total 51 compared to 22 U.S. The smaller Canadian vessels carry less people but make more trips, thus it is estimated that both countries take out nearly equal numbers of passengers.

The core commercial season begins in April and goes throughout the summer into October. A small portion of the companies remain active over the winter and spring whenever whales are present. A small commercial season is beginning to occur in the off-season months as whales have been more reliably detected over the winter. On average, most companies view whales from 9 a.m. to 9 p.m., with concentrations occurring between 10 a.m. and 5 p.m. However, more and more companies are offering sunset trips and stay out until nearly 10 p.m. during peak summer months. This region also attracts great numbers of private boaters both for fishing and general recreation. Many engage in whale watching activities, making up nearly 30% of all vessels traveling with the whales (Koski, 2005).

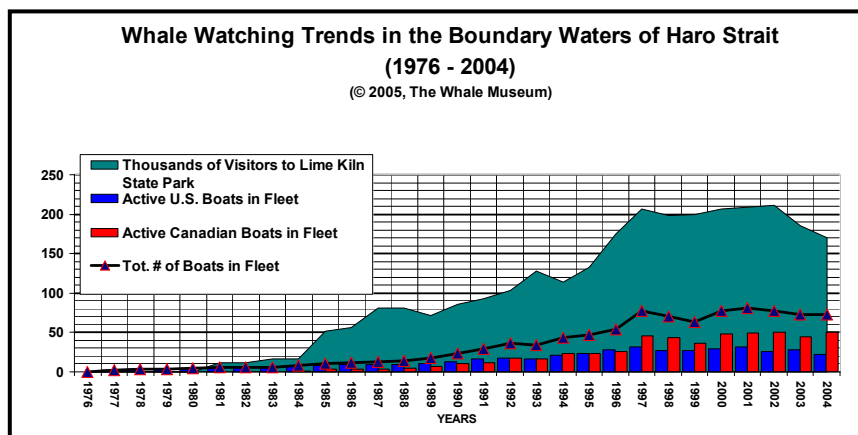


Figure 3. Long-term trends in Whale Watching 1976-2004

San Juan Islands Whale Watch Workshops

Concerned about the growth of vessel-based whale watching and its potential impact to the whales, The Whale Museum became involved with whale watch management issues early on. In 1988 this process was initiated with a grant from the Puget Sound Water Quality Authority *Public Involvement and Education Fund* (PIE) for a traveling exhibit called *Soundwatch: Marine Mammals and the Health of Puget Sound*. That same year the U.S. National Marine Fisheries Service (NMFS) and the Center for Marine Conservation requested The Whale Museum present an overview of whale watching activities on killer whales in Washington State for the *Workshop to Review and to Evaluate Whale Watching Programs and Management Needs* held in Monterey, CA. The paper prepared for this workshop (Osborne, 1988) presented the results of a 1988 commercial whale watching survey conducted by The Whale Museum to establish historical trends in the number of commercial operators, number and size of their boats, number of customers, and number of trips per year in both Washington State and Southern Vancouver Island. Results were also presented at the *Puget Sound Research Symposium 1991* (Osborne, 1991). The survey was then resubmitted to the industry in 1992 and some measures have been kept current by The Whale Museum's Soundwatch program and affiliated outside investigators during the years since (Osborne, 1998; 1999; Otis and Osborne, 2001; Osborne et al 2001; Koski, 2005).

As part of the industry surveys The Whale Museum also conducted the *First Annual San Juan Islands Whale Watching Workshop* and held subsequent community workshops from 1988 to 1997 (13 workshops total). These workshops brought commercial, private and shore-based whale watchers, non-governmental organizations (NGO's) and scientists together to discuss emerging whale watching issues and techniques to reduce potential vessel impacts on the whales and shore-based whale watchers. During this time The Whale Museum produced the first set of regional *Whale Watch Guidelines* summarizing the recommended NMFS guidelines to prevent marine mammal harassment as prohibited under the Marine Mammal Protection Act (MMPA) of 1972.

On-the-Water Patrols

In 1993 The Whale Museum established the on-the-water component of the *Soundwatch Program* by offering a field studies course focusing on the ecology of southern resident killer whales in conjunction with The School For Field Studies (SFS). In 1993 and 1994, SFS students participated in field data collection on whale and boat interactions and distributed guidelines as part of their undergraduate course work. Study platforms included 2 shore-based

theodolite stations and one vessel patrol boat, *Soundwatcher*. Over the field season, boater education became the focus of the vessel patrols and San Juan specific *Boater Guidelines* were developed to educate private boaters on proper vessel etiquette in local waters. The educational materials included orca identification and individual flyers targeting specific boat types as well as outlining the laws as written under the MMPA.

Since 1995, The Whale Museum has run the Soundwatch Boater Education Program as an independent stewardship program of the museum. The goal of the program is to reduce disturbance to marine wildlife by educating boaters before they leave the shore and to reinforce the learning experience in the context where disturbances take place. Supporting objectives include participation in the development of annual community-based voluntary *Boater Guidelines*, and providing a scientific platform to help characterize vessel activities and to evaluate the successes and failures of current guidelines.

In 1994, as an experiment, The Whale Museum conducted two *No Sound in the Sound Days* to reduce the potential noise impact from vessels around the whales. Success of the *No Sound in the Sound* experiment was due largely to individual commercial whale watch companies operating in agreement as an industry and coordinating with the educational patrol vessels. Over 80 regional environmental organizations and businesses endorsed this effort, reaffirming public interest in addressing emerging whale watch issues. This unprecedented cooperation and participation in conjunction with the whale watch workshops, paved the way for the establishment of the transboundary commercial whale watch association and an operator's code of conduct in 1994.

The Whale Watch Operators Association Northwest

The international Whale Watch Operators Association Northwest (WWOANW) provided an opportunity for commercial operators to address issues of marine wildlife relative to commercial operations. Since its formation in 1994, the majority of companies operating in the transboundary waters have been WWOANW members.

The association adopted a code of conduct for business operations as well as a working set of international voluntary guidelines for commercial boat operators that were more explicit than what was currently outlined by both the U.S. and Canadian federal governments. Annually, the WWOANW held membership meetings to discuss current issues and to adopt a new set of working guidelines to best meet changing wildlife and human use conditions. The WWOANW consulted with community groups like The Whale Museum, local residents, regional scientists and marine mammal protection agencies to provide recommendations for guideline adjustments. The large, annual WWOANW meetings eventually took the place of the community whale watch workshops hosted by the museum. Each spring the association held international driver trainings to update guideline changes and relevant whale and policy information. The association has long had an internal system to apply peer pressure to member company drivers not deemed to be following the agreed upon guidelines. *Courtesy Reminders* were faxed to company owners and discussed off the water to avoid conflict situations. Executive association members then reviewed on-going complaints and addressed concerns to individual member companies.

From the beginning, the Soundwatch Program has worked closely with the WWOANW to improve boater behavior on the water through the use of best practice guidelines and monitoring of boater behavior. Since 1997, Soundwatch has provided *Feedback Reports* to WWOANW members on observations of individual company drivers operating contrary to the agreed upon guidelines. The *Feedback Reports* were intended to help drivers improve their behavior and provide the basis for evaluation of how well the current guidelines were working. Soundwatch has encouraged the association to reflect on the seasonal feedback and to use the best available science and the precautionary principal when making annual adjustments to the operator guidelines. In 1996 the first *Voluntary No Motor Zone* was established at Lime Kiln Point Whale Watch Park to provide a boat free corridor for shore based whale watchers as well as a noise and boat free corridor for the whales. Later in 1998, the zone was expanded to include most of the shoreline along San Juan Island.

Annually the WWOANW has charged a fee from companies to become or maintain membership. Additionally, a separate fee was assessed per vessel, per seat, per number of daily trips. Moneys from this separate fee went into a Grants Fund Account for the association to annually fund research, education or conservation projects relevant to killer whales and other Salish Sea marine wildlife.

Table 1. Early Whale Watching Management in Haro Strait	
1988-Present	The Whale Museum begins research and education on whale watching (industry surveys, public meetings/workshops, first San Juan Whale Watch guidelines). Growth of the whale watch industry.
1993-Present	The Whale Museum initiates on-the water educational patrols and data collection as the <i>Soundwatch</i> program. Soundwatch creates new <i>San Juan Island Whale Watch Guidelines</i>
1994-Present	International <i>Whale Watch Operators Association Northwest</i> (WWOANW) is formed with self-regulatory guidelines, operators code of conduct and grant fund.
1995-Present	WWOANW and Soundwatch use best available science to annually update and implement voluntary guidelines through an Adaptive Management Model of monitoring and adjustment.
1998-Present	Increasing participation/support for voluntary guidelines from Canadian and U.S. federal, state and local governments. WWOANW and Soundwatch create voluntary No-Motor Boat- Zones for whale watching along San Juan Island. Soundwatch begins <i>Feedback Reports</i> to WWOANW operators.
1999	COSEWIC declares local orca populations <i>Threatened</i> in Canada.

Transboundary Monitoring Programs

In 2001, the Victoria, B.C. based non-profit Veins of Life Watershed Society and Fisheries and Oceans Canada (DFO) piloted the Marine Mammal Monitoring Project (M3) using Soundwatch as a model and a partner. Now an annual program, M3 and Soundwatch function as trans-boundary counterparts, working together to increase the effectiveness and efficiency of both on-the-water-education and monitoring efforts.

Be Whale Wise Guidelines

In 2002, Soundwatch, M3, NMFS, DFO and the WWOANW worked closely to devise a unified, single set of voluntary guidelines for boaters that were easy to understand and addressed whale watch concerns that all stakeholders could agree to. *The Be Whale Wise Guidelines for Watching Marine Wildlife* has now been adopted as the regional best practices with DFO and NMFS endorsement. It was the expressed interest of all parties that the *Be Whale Wise Guidelines* be periodically evaluated and adjusted as needed to remain responsive and adaptable. In subsequent years, no changes have yet been made to the content of the guidelines and each government has alternately covered brochure and poster printing costs. Both governments have made the *Be Whale Wise Guidelines* a part of larger killer whale recovery campaigns and have made public outreach a priority. This has greatly enhanced the efforts of Soundwatch and M3 in reaching more recreational boaters before they leave the shore. The WWOANW continues to have its own set of operator guidelines that are more explicit for commercial operators and Soundwatch still produces San Juan specific *Boater Guidelines* outlining voluntary location restrictions and supplements with periodic seasonal flyers.

Increased Enforcement Presence

Currently there are no specific marine wildlife viewing or whale watch regulations in the U. S. or Canada. In the U.S., marine mammals are protected under the MMPA with some species having additional protection under the Endangered Species Act (ESA). Marine mammals are managed by the NMFS who have sole jurisdiction superceding any state or local governments. In Canada, DFO are the managers upholding protections of the Marine Mammal Regulations (MMR) section in the Fisheries Act of 1993 and the newly adopted Species At Risk Act (SARA) of 2004. All measures prohibit marine mammal harassment or disturbance. Harassment or disturbance has been loosely defined as any action that *substantially alters marine mammal behavior or life processes*. Both governments have developed and promoted regional guidelines for viewing practices that aim to prevent harassment, but neither have had a significant enforcement presence, nor have they played a significant role in shaping past whale watch industry practices in the region.

This is beginning to change as continued concern has incited a variety of state and/or federal protections for the SRKW in both the U.S. and Canada. To further promote the *Be Whale Wise Guidelines* and be responsive to public concern regarding whale watch vessel behaviors, both federal governments have made efforts to have more of an enforcement presence on the water. DFO has instructed fisheries enforcement officers to spend a portion of their water time observing whale watch activities in Canadian waters. Likewise, the NMFS and the Washington Department of Fish and Wildlife have teamed up to provide more water coverage during peak whale watching months in high traffic areas. While the enforcement is largely observing and providing additional support for the education and monitoring programs, they are also there to uphold existing MMPA, MMR, and SARA regulations.

In 2004, a U.S. and a Canadian commercial whale watch operator, both operating in Canadian waters, were prosecuted under the Canadian MMR and fined for the ‘intentional, and for an extended period of time, close proximity’ to SRKW in the Canadian Gulf Islands. The judges in both cases reasoned that both operators were in full knowledge of operating their vessels with in close distances to killer whales for the enjoyment of their passengers and that both operators were well aware of the best practice guidelines (*Be Whale Wise*). In one case the judge ruled that the MMR had been violated, not because SRKW had been proven to be harassed, which “would place an unreasonable burden [of proof] on enforcement” but that the “operation of the vessel in such a manner and such proximity to killer whales undoubtedly constituted a risk of physical harm to the whales and without a doubt also constituted a disturbance to them” (Regina vs. Fossum, File # 25236, 2004). In both cases the guidelines were ruled as intentionally not followed, thereby putting the whales in danger. In one case the Judge voices that the “public trust was violated by the operator’s behavior” and that a “message need be sent to the whale watch community that this type of behavior simply will not be tolerated by the courts” (Regina vs. Maya, File #25237-1, 2004). While few would argue against the need for consequences for repeated ‘bad’ vessel behavior around whales, defining what ‘bad’ behavior is and what effects it might have on whales has not been clearly defined. By ruling that enforcement does not need to prove that the whales were harassed, only that the vessel operator behavior was contrary to guidelines intended to prevent harassment, is to use the voluntary guidelines as regulatory measures in the Canadian court. These two cases have set a Canadian precedent for commercial operators to act with due diligence in following the *Be Whale Wise Guidelines* in order to be in compliance with the MMR.

Since the prosecutions, both DFO and NMFS enforcement officers have undergone Guideline Training Workshops and have met with the WWOANW to make sure there is a general agreement and understanding of the *Be Whale Wise Guidelines* and expected commercial operator behavior.

Table 2. Government Initiatives

2001-Present	COSEWIC lists SRKW as <i>Endangered</i> . DFO pilots Marine Mammal Monitoring Program (M3). NMSF petitioned to list local Orcas as <i>Endangered</i> under ESA. San Juan County petitioned to regulate <i>Whale Chasing</i> in San Juan County.
2002-Present	<i>Be Whale Wise</i> Guidelines; NMFS, DFO, WWOANW, Soundwatch and M3. San Juan County recommends continuation of education programs. NMFS denies ESA Listing.
2003-Present	NMFS lists Southern Residents as <i>Depleted</i> under the Marine Mammal Protection Act DFO, NMFS, WDFW Enforcement on the water. SRKW declared Canadian Species at Risk. DFO Public Consultations on Marine Mammal Regulations NMFS Public Consultations on Marine Mammal Protection Act Regulations.
2004-Present	Washington State lists Southern Residents as <i>Endangered</i> . Species at Risk Act (SARA) enacted in Canada. U.S. and Canadian commercial whale watch operators prosecuted in Canada NMFS recommends listing SRKW as <i>Threatened</i> under ESA.
Present	NMFS Draft Conservation Plan for SRKW. DFO Draft SRKW Recovery Strategy, Draft Amendments to MMR.

Government Initiatives

As of March 2005, the SRKW are listed as *endangered* in Canada by the Committee on Status of Endangered Wildlife in Canada (COSEWIC, 2001) and is considered a *Species at Risk* under the newly ratified Species at Risk Act (SARA, 2004). They are considered *depleted* under the U.S. MMPA (NMFS 2002) and are presently being recommended for listing as *threatened* under the U.S. Endangered Species Act (NMFS 2004). In 2004 they were also listed as *endangered* by the state of Washington (WDFW 2004). Each of these listings carries its own procedures of public process that in most cases must be carried out by law despite obvious redundancies between jurisdictions. Potential threats have been consistently identified as prey availability, pollution, and vessel disturbance. Listing status has prompted federal and state recovery plans that include vessel management to minimize potential disturbance from vessels. Many conservation groups are advocating for mandatory, enforceable whale watch regulations and several community interest groups are putting pressure on the federal governments to make amendments to the MMR and the MMPA that would extend protection from some whale watching activities. As federal conservation and management plans for SRKW are formulated over the next year, the role of adaptive management in the Salish Sea will be decided.

DISCUSSION

Threats to the Adaptive Management Process

The entire northwest region experienced unprecedented prosperity and population growth during the period between 1994 and 1999. New residents and visitors were flooding the San Juan and southern Gulf Islands. During this time a growth explosion took place in recreational and commercial whale watching peaking in 1998. International attention on viewing opportunities as well as economic and human impacts from whale watching, heightened worldwide participation, concern, and increased academic and research interest. In the mid 1990's the Southern Resident Killer Whales (SRKW) began to show a significant population decline increasing public and management agency concerns. COSEWIC was the first group to formerly declare the local populations of killer whales as *threatened* in 1999.

The first and subsequent listings, plus the mounting attention whale watching was receiving in the media, opened the doors to more players, issues, government funding and larger repercussions regarding whale watch management. The new complexity began to overwhelm the community-based adaptive management process previously in place. The increased number of stakeholders and issues involved, threatened the current '*rational, data driven, objective-based management that previously linked research and management*' because the objectives became suspect. The endless process of '*questioning existing assumptions, exploring alternative ones, envisioning potential scenarios for management, made experimenting with solutions*' untenable.

The semi-annual invitational WWOANW meetings largely replaced the annual San Juan Island Whale Watch Workshops that previously were open to the public. Invited NGO, scientist and other stakeholder participation at the WWOANW meetings took up much of the time needed for members to address issues specific to business operations or guideline adjustments. Fewer and fewer members invested time for meetings or participation in the annual process. The already fragile relationship between international business owners became amplified as individual operators increasingly made decisions on behalf of the larger the association. Erroneous information in the media gave the impression commercial whale watchers were the direct cause for SRKW declines. This created a defensive atmosphere amongst commercial whale watch operators, research scientists and NGO groups and generated mistrust.

Adding to the WWOANW unease was the perceived regulatory agenda of monitoring groups operating under government-funded programs. After the adoption of the regional *Be Whale Wise Guidelines* in 2002, the whale watch industry largely abandoned the precautionary approach and became hesitant to implement new guidelines. Instead, they began to pressure research scientists to first prove that their activities were adversely affecting the whales before implementing changes in practice. Following the two commercial operator prosecutions in Canada, where the guidelines were used as though they were regulations, the whale watch industry became even more reluctant to participate in the adaptive process that they helped create nearly a decade earlier.

Future Recommendations

The current community-based adaptive management process for developing and evaluating best practice guidelines for vessel-based whale watching in the Salish Sea has experienced difficulties due largely to growing pains associated with increasing numbers of stakeholders and complexity of issues. However, this does not imply that the process should be abandoned. Rather, it needs to be re-invigorated and adjusted to meet the new conditions. The process itself needs to be 'adaptively managed', i.e. meta-managed.

Adaptive management has been identified as an integral part of salmon recovery plans in Washington State by the U.S. federal government (Shared Strategies for Puget Sound, 2005) and could also be an integral part of future Southern Resident Killer Whale Recovery plans. The creation of future strategies and actions for whale recovery in regards to vessel-based whale watch management already has a decade of outcomes from implemented actions for evaluation. What is needed to augment the current adaptive management process is a more formal institutional structure that all stakeholders recognize and participate in.

A way to reinvigorate the community-based adaptive management process for vessel-based wildlife viewing in the Salish Sea is to employ a federally mandated structure that requires stakeholders to participate in the adaptive management framework. Standard management measures that would meet this criteria could include the following examples:

- A finite number of key enforceable whale watching regulations on proximity and speed near whales evaluated and adjusted on a multi -year cycle;
- Voluntary Boater Guidelines annually adjusted for localized conditions that continue to include temporal and spatial restrictions for commercial and recreational whale watching;
- Required participation in the WWOANW for all commercial whale watch operators that could include special licensing or permitting;
- Continuation of public education, vessel activity monitoring and a dedicated enforcement program.

If federal and state mandates require stakeholder participation and provide a structured framework then community-based adaptive management can continue for vessel-based wildlife viewing in the Salish Sea.

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