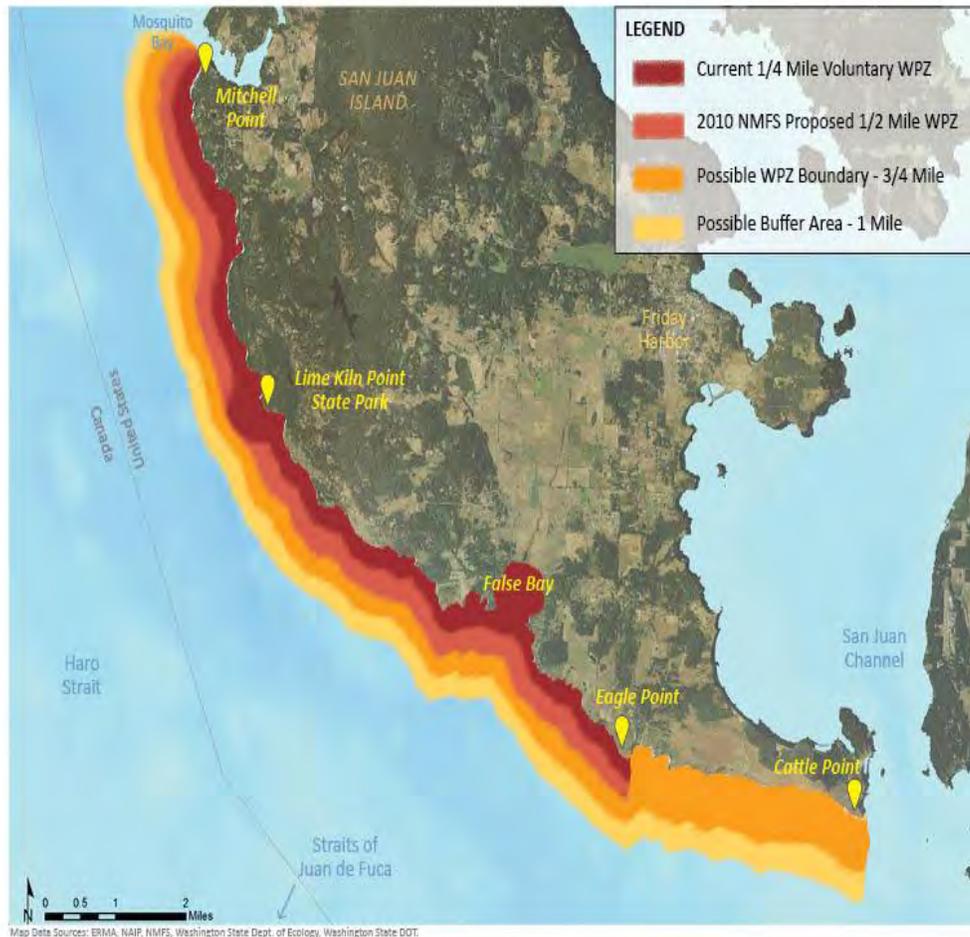


Concept for a Whale Protection Zone for the Endangered Southern Resident Killer Whale



Supported by Charlotte Martin Foundation, Norcliffe Foundation, and Jon and Mary Shirley Foundation

The concept described in this document includes information on how a protected area for the endangered Southern Resident Killer Whale could be designed, managed, monitored, and enforced.

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Concept for a Whale Protection Zone for the Endangered Southern Resident Killer Whale

EXECUTIVE SUMMARY

Why Is a Whale Protection Zone Needed?

The Southern Resident Killer Whales Are Endangered and Still Declining

In 2005 the US National Marine Fisheries Service (NMFS) listed the Southern Resident Killer Whale (SRKW; *Orcinus orca*) population as endangered under the Endangered Species Act. There are now 77 individual SRKWs; declining from a peak of 98 in 1995, the population is now at its lowest level since 1985, and is poised for further decline.¹

Measures taken by NMFS to date have not recovered the Southern Residents and, based on the recent trend, have not been sufficient to maintain the population at a stable level. The current vessel separation rules, established Critical Habitat, and existing voluntary “no-go-zone” are not providing enough protection. Furthermore, future recovery efforts will be confounded by the SRKWs’ distorted age-sex composition and declining reproductive capacity.

Minimizing “Noise and Disturbance” Is Necessary for Recovery

The main thrust of recovery efforts must be to conserve key habitat. All the major risk factors – described in the 2008 SRKW recovery plan – are forms of habitat degradation. They include insufficient prey (primarily Chinook salmon), environmental contaminants, and vessel-caused noise and disturbance. NMFS has determined that minimizing the disturbance of the SRKWs by vessels is necessary for their recovery.

Over a decade of research by NMFS specialists and other scientists has determined that the Southern Resident Orcas are harmed by this dangerous set of factors:

1. In years of low Chinook salmon returns, SRKWs are under stress to find food.
2. Constant pursuit by vessels (which include the commercial motorized whale watching fleet and the recreational boats the fleet attracts) leads to increased stress levels, increased metabolic rates, and an increased need for food, while simultaneously reducing the whales’ sonar – and therefore

¹ Based on publicly available data from the Center for Whale Research and National Marine Fisheries Service.

hunting – efficiency. This is happening during daylight hours from May to October; then:

3. As whales starve, they consume the toxins locked in their blubber reserves, which very likely harm their reproductive capacity and overall health.

Increasing the number of salmon and reducing toxins in Puget Sound must be accomplished, but will likely take many decades and huge expenditures of scarce public resources. In contrast, establishing a Whale Protection Zone for the endangered Orca can be achieved relatively easily, inexpensively, and quickly (see Map 1).

The Existing Federally Designated Critical Habitat Is Not Sufficient

While valuable, Critical Habitat currently provides only limited regulatory control of federal activities that might be harmful to the SRKWs, and no control of the commercial whale watching fleet and other private boats. A WPZ in the heart of the SRKW Critical Habitat will provide significant opportunities for these endangered whales to hunt, socialize, and rest, unhampered by the noise and disturbance they experience currently.

Immediate Assistance Is Required

As the federal agency entrusted with helping the SRKW to recover, NMFS has promised to “expeditiously” pursue the work necessary to develop a WPZ. NMFS must begin the process now, because the best available information indicates there would be a significant conservation benefit to the whales if they were free of all vessel disturbance in one of their core foraging areas (off the west side of San Juan Island, Washington).

Objectives of the Orca Relief Citizens' Alliance (Orca Relief) Concept

Orca Relief's goal is the recovery of the Endangered Southern Resident Orca. A significant step toward that recovery is to create a Whale Protection Zone, and to create a WPZ NMFS must initiate, conduct, and conclude the required public process. To help catalyze this public process, offers the recommendations below on a number of key elements of a WPZ, including how to design, manage, and enforce such a protected area.

The objectives of this WPZ concept are to enhance Orca resting and feeding opportunities by reducing the noise and disturbance the Southern Residents experience. This can be accomplished by protecting the center of SRKW Critical Habitat. We expect that a WPZ off the west side of San Juan Island will enhance the experience of shore-based whale watching (especially at the Limekiln Lighthouse “Whale Watch Park”). We also provide ideas for meaningful additional management elements and mechanisms for enforcement.

The Orca Relief seeks to work with all interested parties to address the causes of, and solutions for, reversing SRKW decline.

Significant Elements of a Whale Protection Zone for the SRKW

Element A: Geographic Dimensions

The WPZ should be established off the west side of San Juan Island, Washington, with boundaries that specifically account for SRKW feeding, socializing, resting, and other behaviors. The WPZ will be relatively small compared with the total area of the current federally designated Critical Habitat. Some of the key features to be researched carefully during a public regulatory process are feeding “hot spots,” as well as areas known to be important for resting and communications. Careful consideration should be given to the details within the general area of a mile offshore between Mitchell Point and Cattle Point. Some parts of this area may need more (or less) protection due to locations of shore-based whale watching, noise coming from large ships in nearby shipping lanes, bottom topography, and other factors.

Element B: Temporal Dimensions

Orca Relief recommends that the WPZ be in force annually from April 15 to October 15, although a year-round zone and other dates should be carefully considered.

Element C: Buffers and Edge Effects

ORCA recommends that a “No Wake” speed restriction be in effect whenever boats are within 400 yards of any whale.² The effects of boats waiting at the edge of the zone for whales should be carefully studied.

Element D: Additional Sections of the WPZ and Connections to Networks

ORCA recommends that other areas be considered in depth (e.g., areas around Stuart Island, Hood Canal, Vashon Island) for future additions to the WPZ. The WPZ should also have a significant role in the Whale Trail system of shore-based whale watching.

Element E: Additional Regulatory Components

A permit system for the commercial whale watching fleet is recommended, likely combined with required Automated Identification Systems (AIS). Other regulatory techniques should also be carefully considered, specifically observers on whale watching boats and video monitoring (especially

² Although the SRKWs would be the most likely to be found in the WPZ, the regulations should apply to all whales when they were inside the zone.

on shore). In addition, the US Environmental Protection Agency should regulate the air pollution in the WPZ and other parts of the SRKW's Critical Habitat. Special parameters for kayaks, fishing boats, and other vessels in the WPZ will need careful consideration.

Element F: Compliance Monitoring and Enforcement

Monitoring and enforcement will be the key to the WPZ aiding the recovery of the SRKW. Effective enforcement of the WPZ will depend on sufficient funding and engagement by NMFS and especially the Washington Department of Fish and Wildlife. Strategies include Notices to Mariners, shore-based video and/or listening stations, labeling and signs, and strengthening of the state/federal Joint Enforcement Agreement. Much greater effort should also be made to harmonize U.S. enforcement efforts with those in Canada.

Element G: Education

Greater and improved education will be needed to ensure that the WPZ actually aids in SRKW recovery. Techniques include boater education cards, changes to the "Be Whale Wise" guidelines, announcements by Washington state government agencies and the US Coast Guard, phone apps, notices in state fishing rule books, outreach on social media, and changes to the KELP education programs. Much greater effort should also be made to harmonize U.S. education efforts with those in British Columbia.

Concept for a Whale Protection Zone for the Endangered Southern Resident Killer Whale

BACKGROUND

In March 2014, Orca Relief Citizens' Alliance (Orca Relief) hosted a workshop of Orca specialists (see Appendix A) for the purpose of considering how a prospective Whale Protection Zone (WPZ) for the endangered Southern Resident Killer Whale (SRKW) might be designed. The outline that emerged from that workshop is reflected in the sections below. We have also included some important background information and additional ideas that have emerged since the workshop.

Orca Relief intends to use the information and ideas herein to:

- Encourage the National Marine Fisheries Service (NMFS) to begin a public process as soon as possible to create a Whale Protection Zone for the SRKW
- Catalyze a conversation with the public about the important role that a WPZ could play in helping the SRKW recover
- Provide useful information to other groups wishing to join the Orca Relief Citizens' Alliance in a coalition to support the creation of a WPZ

Why Is a Regulatory Whale Protection Zone Needed?

The Southern Resident Killer Whale (*Orcinus Orca*) is an endangered population, and its numbers are declining, rather than recovering, with a 2014 census count of just 77 members. This is the lowest number since 1985³ – the SRKWs are no better off now than three decades ago. There are also dangerous declines in the number of reproductive females and males, juvenile females, and newborns.⁴

In 2005, the Southern Resident Killer Whale was listed as an endangered population under the Endangered Species Act.⁵ (See Appendix B for regulatory history.) As required by the Endangered Species Act (ESA), and in an effort to enable the SRKW to fully recover, NMFS established Critical Habitat for the

³ Based on publicly available data from the Center for Whale Research and National Marine Fisheries Service

⁴ <http://www.Orcarelief.org/status/>. Orca Relief analysis of publicly available data from the Center for Whale Research and National Marine Fisheries Service.

⁵ *Federal Register* 70:69903.

SRKW in 2006⁶ and drafted a *Recovery Plan for Southern Resident Killer Whales* in 2008⁷.

As part of its recovery planning, NMFS established recovery targets of 113 SRKWs by 2015 and 155 SRKWs by 2029 (an average increase of 2.3% per year).^{8,9} This endangered population has lost many years of possible recovery with no protected area to assist them. With only 77 whales remaining, and continuous decline clearly underway, current recovery efforts are not working, and the existing Critical Habitat provides only limited protection.

Minimizing “Noise and Disturbance” Will Significantly Help Recovery

When the SRKWs were designated as endangered in 2005, NMFS cited, among other reasons, “sound and disturbance from vessel traffic . . . and their overutilization for commercial and recreational purposes.”¹⁰ In 2008, NMFS determined that one necessary element for recovery of the SRKWs was minimizing their disturbance by vessels. At that time, voluntary distance guidelines were in place, but NMFS determined that:

“. . . existing prohibitions, regulation, and guidelines [did] not provide sufficient protection of killer whales from vessel impacts. Vessel effects may limit the ability of the endangered SRKWs to recover and may impact other killer whales in inland waters of Washington. NMFS therefore [deemed] it necessary and advisable to adopt regulations to protect killer whales from vessel impacts, which will support recover of the SRKWs.”¹¹

“Monitoring groups report[ed] a high number of incidents of vessels not following the current viewing guidelines in [the inland] waters [of Washington], particularly along the west side of San Juan Island.”¹²

A WPZ is needed because it will minimize noise and disturbance in the core of SRKW Critical Habitat and give this endangered population more rest and quiet so they can hunt undisturbed by motorized vessels.

⁶ *Federal Register* 71(229):69054. Critical Habitat is “the specific areas within the geographic area occupied by the species . . . on which are found those physical or biological features . . . essential to the conservation of the species and . . . which may require special management considerations or protection.” 16 U.S.C. §1532(5)(A)(i),(ii).

⁷ NMFS 2008.

⁸ NMFS 2008, p. IV-4

⁹ The historic population is likely to have been 140 minimum; it may have been as high as 200 or more. NMFS 2008, p. II-54-6

¹⁰ *Federal Register* 70:69910

¹¹ NMFS 2010, p. 1-5

¹² NMFS 2010, p. P-7

A Regulatory WPZ Is More Likely to Be Effective Than Voluntary Guidelines

In 2010, to take the essential step for minimizing vessel noise and disturbance, NMFS established Protective Regulations for the SRKW under the Endangered Species Act and Marine Mammal Protection Act.¹³ These regulations limit the approach of all vessels to a boundary of 200 yards from an Orca and forbid parking in their path while the whales are traveling. NMFS has concluded “that in general, vessel operators are more likely to adhere to mandatory specific regulations [e.g., a regulatory WPZ] than to the current [San Juan County] voluntary [protection zone {see Map2}]. This likelihood . . . would be affected by the clarity of the rules, motivations to comply, and the level of monitoring and enforcement.”¹⁴

NMFS based its decision to propose mandatory rules (rather than maintain the voluntary guidelines and protection zone) on its assessment that “citizens may be willing to comply with [the new regulations] out of a sense of civic duty or obligation, social influences, fear of sanctions, or economic consequences associated with non-compliance. These factors may affect compliance differently for commercial and recreational vessel operators”¹⁵ Ultimately, “vessel operators are more likely to adhere to mandatory specific regulations than to the current voluntary guidelines.”¹⁶

Critical Habitat Provides Only Limited Regulatory Protection

In 2006, NMFS designated Critical Habitat (CH) for SRKWs in inland Washington waters (approximately 2,560 square miles; see Map 3).¹⁷ To help protect an endangered species, Critical Habitat designation triggers Section 7 consultations,¹⁸ which the Center for Biological Diversity notes “assist federal agencies in determining whether consultation is required for actions beyond those that result in direct mortality or injury [to SRKWs]. In addition, the designation of [CH] highlights geographic areas that require special consideration [such as the proposed WPZ] . . . [CH] also [helps] to focus federal, state and private conservation and management activities, including recovery efforts [such as a WPZ], in the areas that most require protection.”¹⁹

Unfortunately, Critical Habitat designation and Section 7 consultations do not then result in legal protection for the SRKW; simply designating areas of

¹³ *Federal Register* 76(72):20870

¹⁴ NMFS 2010, p. 4-4

¹⁵ NMFS 2010, p. 4-2

¹⁶ NMFS 2010, p. P-13

¹⁷ *Federal Register* 71(229):69066

¹⁸ A Section 7 consultation is conducted by NFMS on “actions” by other federal agencies to advise them as to how to reduce or mitigate the impacts of the actions to ensure recovery of the SRKWs

¹⁹ CBD 2014

special concern that require consideration during federal decision making is not sufficient. Without some form of federal permitting, a Section 7 consultation would not occur for commercial and private whale watching (although it could be helpful with large ships, which are federally regulated).

Despite these limitations, Critical Habitat is an important guideline, and the geographic location Orca Relief is recommending for a WPZ is in the center of the Summer Core Area (Area 1) of the designated CH, on the west side of San Juan Island.²⁰ Historically, SRKWs “have been sighted in Area 1 during every month of the year, but sightings are more consistent and concentrated in the summer months of June through August.”²¹ The agency noted that “habitat areas for these killer whales are unique and irreplaceable.”²²

While setting of CH was an important step (and required by the “endangered” designation), NMFS could have included, but did not, “quiet” or lack of disturbance as one of the “physical or biological features of Southern Resident killer whale habitat.”²³ On the other hand, it did include “passage conditions to allow for migration, resting, and foraging.”²⁴ Quiet and lack of disturbance are necessary for these passage conditions to be met. It should be noted that “in contrast to the U.S., Canada recognizes ‘acoustic degradation’ of Critical Habitat . . . as a threat to killer whale recovery, and it is illegal [in Canada] to introduce sufficient noise in Critical Habitats to ‘destroy’ it.”²⁵

At the same time, the Endangered Species Act defines CH as an area “which may be warranted by the need for space for individual and population growth, or for normal behavior, cover and shelter, and most importantly habitats to be *protected from disturbance*.”²⁶ In our judgment such “special management considerations or protection” is clearly warranted for the Summer Core Area.

It should be noted that one of the Primary Constituent Elements (PCEs) of CH is “sound levels that do not exceed thresholds that inhibit communication or foraging activities or result in temporary or permanent hearing loss.” Comments to the proposed CH in 2005 “argued that NMFS should consider sound an element of the physical environment of water, just as NMFS considers water quality, prey and passage habitat conditions.”²⁷ The Orca Relief Citizens’ Alliance agrees.

²⁰ *Federal Register* 71(229):69054

²¹ *Federal Register* 71(229):69062

²² *Federal Register* 71(229):69065

²³ *Federal Register* 71(229):69061

²⁴ *Federal Register* 71(229):69061

²⁵ Center for Biological Diversity 2014, p. 15, note 123

²⁶ 50 C.F.R. § 424.12(b) (2012) [emphasis added]

²⁷ *Federal Register* 71(229):69055

Finally, the Center for Biological Diversity has petitioned NMFS to “adopt a fourth PCE for the [SRKW] for both its summer and winter range Critical Habitat area providing for in-water sound levels that: (1) do not exceed thresholds that inhibit communication or foraging activities [see Element A], (2) do not result in temporary or permanent hearing loss to whales, and (3) do not result in abandonment of Critical Habitat areas.”²⁸ Orca Relief supports the CDB’s petition.

Noise and Disturbance Likely Increase as the Number of Ships Increases

Currently, between three and five ocean-going ships might travel past the WPZ site each day (within the established shipping lanes). While there are relatively few now, the noise and disturbance from these ships will increase (possibly to being almost constant) as the number of ships increases, especially due to possible coal and oil shipments. These shipments will also dramatically increase the potential for catastrophic harm to the weak SRKW population from a spill.

The effects the noise and disturbance will have on the SRKWs and the WPZ should be studied carefully by NMFS during the regulatory process. There is precedent for NMFS taking regulatory actions to protect whales; for Northern Right Whales, NMFS took the following steps which should be reviewed in depth for applications to the SRKWs:²⁹

- Mandatory vessel speed restrictions in Seasonal Management Areas
- Voluntary speed reductions in Dynamic Management Areas
- Recommended shipping routes
- Areas to be avoided
- Modification of international shipping lanes
- Aircraft surveys and right whale alerts
- Mandatory ship reporting systems
- Outreach and education

To limit noise from ships, ship speed would generally need to be reduced to 10 knots (from the currently common 18-20 knots); noise levels will depend on the load in the ships.

²⁸ Center for Biological Diversity 2014, p. 20

²⁹ http://www.nmfs.noaa.gov/pr/species/mammals/cetaceans/rightwhale_northatlantic.htm

CURRENT STATUS OF A PUGET SOUND WHALE PROTECTION ZONE

Although proposed as part of NMFS' final 2010 regulations to protect SRKWs from vessel noise and disturbance (see Map 4), a WPZ was not included in the final rule, despite the agency's concern that "some whale watching activities may harm individual killer whales, potentially reducing their fitness and increasing the population's risk of extinction."³⁰ NMFS promised it would "develop additional information and seek public input to further evaluate the costs and benefits of a [WPZ] and [might] propose a rule revision in the future." NMFS also stated that a WPZ "could provide higher benefits to the [SRKWs] by reducing vessel impacts in a core foraging area" (e.g., off the west side of San Juan Island).³¹

The agency promised to "pursue this additional work **expeditiously** because the best available information indicates there would be a significant conservation benefit to the whales if they were free of all vessel disturbances in their core foraging area."³²

In its 2014 review of *10 Years of Research & Conservation* on SRKWs, after expressing concern about the failure of the SRKWs to recover, NMFS declared that "we also plan to explore additional management actions outlined in the recovery plan." Furthermore, the agency said that "seasonal health assessments, habitat use, and potential times and places with prey limitations or vessel impacts that affect health or feeding will be taken into consideration when determining the need for additional conservation actions, *such as a protected area.*"³³

GOALS AND OBJECTIVES

The Goal of the Orca Relief Citizens' Alliance:

Recovery of the Endangered Southern Resident Killer Whales

"Scientists estimate the minimum historical population size of [the SRKW] was about 140 animals."³⁴ As part of its recovery planning, NMFS established a target of 155 SRKWs by 2029 (increase of 2.3%/yr)³⁵, and a "down-listing" interim target of 113 by 2015.³⁶ However, the SRKWs have been in decline since 2005, with losses in almost every population category since then: reproductive females down 20%; reproductive males down 13%; juvenile females down 21%;

³⁰ *Federal Register* 76(72):20870

³¹ NMFS 2010, E-3

³² NMFS 2010, P-4-5

³³ NMFS 2014, p. 20 [emphasis added]

³⁴ NMFS 2014, p. 3

³⁵ NMFS 2008, p. IV-4

³⁶ NMFS 2008, p. IV-9; based on a starting point of 81 animals in 2001

1- to 2-year-olds down 63%; and perhaps most serious of all, no surviving newborns since 2012. Only non-reproductive juvenile males are increasing, up 27% since 2005.

Objectives of a Whale Protection Zone:

- Contribute to recovery of the SRKWs
- Enhance SKRW resting and feeding opportunities
- Reduce noise and disturbance from commercial whale watching boats and other motorized vessels
- Protect (by regulation) the center of SRKW Critical Habitat
- Enhance experience of shore-based whale watching (especially at Limekiln Lighthouse “Whale Watch Park”)
- Reduce noise and disturbance from larger ships

Objectives for a Public Process to Establish a WPZ:

- Achieve a Whale Protection Zone
- Provide input for a WPZ design that incorporates meaningful additional management elements and mechanisms for enforcement
- Determine how to best address noise and disturbance as one of the significant causes of the SRKW decline

KEY ELEMENTS OF THE ORCA RELIEF WPZ CONCEPT

In this section, the Orca Relief makes recommendations about how to address the key set of elements of a Whale Protection Zone for the Southern Resident Orca. These elements are necessary components of a WPZ, and we are confident that our recommendations are a significant starting point for a robust public discussion about the role a WPZ can play to help protect the endangered and declining SRKW.

ELEMENT A: GEOGRAPHIC DIMENSIONS

Original NMFS Proposed WPZ

As part of the proposed (2009) new regulations to protect killer whales from vessel effects, NMFS analyzed (but did not adopt in 2011) a formalization of the current voluntary WPZ (which NMFS originally termed a “no-go-zone”).³⁷ The WPZ proposed in 2009 would have been on the west side of San Juan Island expanded to a ½ mile wide (800 meters) zone (6.2 square miles) from Eagle Point

³⁷ NMFS 2010, Alternative 5

to Mitchell Point (see Map 4) on San Juan Island. Orca Relief sees this as a reasonable starting point for significantly more analysis and consideration, in a public process, of a formal regulatory protected area.

Current Voluntary WPZ

There is currently a voluntary WPZ on the west side of San Juan Island which includes a ½ mile wide (800 meters) circle centered on the Lime Kiln Lighthouse, and a ¼ mile wide (400 meters) zone from Mitchell Point to Eagle Point (see Map 2). However, the voluntary WPZ is probably not well known nor understood by private boaters, not well advertised, and (at least anecdotally) generally not well observed.

Orca Relief's Proposed WPZ

ORCA proposes a WPZ - 3/4 mile wide - adjacent to the west side of San Juan Island, extending from Mitchell Point in the north to Cattle Pass in the south (see Map 1). The final zone would be 10-12 square miles, and this would represent only about 0.5% of the approximate area of the inland waters Critical Habitat of 2,560 square miles.

As NMFS has indicated, a WPZ "along the west side of San Juan Island meets the criteria for a successful marine protected area [since it] has the highest number of whale sightings, is an important feeding habitat, and has high levels of vessel traffic and potentially harmful incidents." "Prohibiting vessels from portions of the whales' habitat along the west side of San Juan Island would protect the whales 1) from multiple threats; 2) in an area the local community already recognizes; and 3) [by providing] opportunities to evaluate the effectiveness of the area."³⁸ It is particularly important to regulate and change the behavior of commercial and recreational whale watching vessels, the only craft that routinely follow the SRKWs for extended periods of time during their visits to Puget Sound and the Salish Sea.

The geographic boundaries of the WPZ should be based on:

- Behavioral criteria and identified "hot spots"
- Current and projected boat traffic patterns
- Current and projected sound profiles
- Large ship sounds and contours
- Tides and currents
- Current and projected salmon availability

³⁸ NMFS 2010, p. 4-17; 4-19

The research necessary to give specific locations and detailed analysis for each of these aspects of the WPZ geographic boundary is far beyond the scope of this proposed concept. However, we strongly recommend that significant consideration be given to each of these aspects by NMFS during a public process for establishing the WPZ.

The likely size of the proposed WPZ is relatively small by comparison with many marine protected areas and zones for cetaceans around the world (see Appendix C and Hoyt 2011). However, “small protected areas [can] help conserve [marine mammal] species. Several models for fishery reserves have included migration and movement of animals and show benefits of small protected areas even to highly mobile species.”³⁹

Center on Behavior “Hot Spots” and “Acoustic Advantages”

From NMFS’ perspective, “the basis for setting and designating [protected areas] should rest on an evaluation of the needs of the population at risk [i.e., the SRKW], its distribution, sensitive activities (i.e., breeding, feeding), and threats.”⁴⁰ “Even if [the SRKWs] only [use] the protected area for part of the time, protected areas reduce the frequency of exposure to certain threats and diminish the overall cumulative impact of other threats.”⁴¹

The research literature indicates that the most benefit to the SRKWs may come from protection at places and times that are especially important to their behavior (particularly feeding, resting, and socializing), and that a WPZ would provide “acoustic advantages” that support these important behaviors.

As part of the development of a WPZ, it will be important to define what behaviors are “significant.” We recommend that this be a central line of inquiry for NMFS going forward, since the WPZ should be designed as much as possible to protect these behaviors. “Significant” is likely to mean both something that can be negatively affected by noise and disturbance from vessels, as well as something provable as essential to the whales (e.g., feeding and resting, which can be proved; but also possibly including travel, play, communicating, and more). In some cases, it may be combinations of these behaviors.

A detailed accounting of the behavioral responses of SRKWs to noise and disturbance is beyond the scope of this proposal. However there are some key issues to be considered, based on NMFS categories:

³⁹ NMFS 2010, p. 4-5; Apostolaki et al 2002; Roberts and Sargent 2002

⁴⁰ NMFS 2010, p.4-5

⁴¹ Hooker and Gerber 2004

Disturbance and Noise Effects

- Stopping or reducing feeding, resting, and social interaction⁴²
- Changes in behavior (e.g., leaping, jumping, fin slapping)⁴³
- Abandoning feeding, resting, and nursing areas⁴⁴
- Altering travel patterns to avoid vessels, including faster swimming speeds, unpredictable travel paths, making shorter or longer dives, moving into open water, modified surface behaviors, and altering normal patterns of behavior⁴⁵
- Changes in acoustic behavior⁴⁶
- Masking communication signals⁴⁷
- Increased amounts of stress hormones that have the potential to harm the SKRWs' nervous and immune systems⁴⁸
- Excessive energy expenditure as a result of above activities
- Short-term behavioral changes in the presence of vessels, such as altering travel patterns, etc.⁴⁹
- General issues concerning whale watching and whales⁵⁰

Behavioral Hot Spots. An emphasis on "feeding" and "resting"

When establishing Critical Habitat for the SRKW, NMFS specifically identified waters off the west side of San Juan Island as a "primary feeding area" for these whales.⁵¹ In its 2014 review of *10 Years of Research & Conservation* on SRKWs, NMFS indicated that "several methods have shown the west side of San Juan Island is a foraging 'hot spot' for Southern Residents during the summer."⁵²

"A review [by NMFS] of threats to marine predators suggests they may be most at risk during foraging activities⁵³ and this has been suggested specifically for killer whales."⁵⁴

Prior to a public process on the design of a WPZ, NMFS should seek external and internal expert consideration of whether it is better to protect "hot"

⁴² Constantine et al. 2004; Lusseau, et al. 2009

⁴³ Noren et al. 2009

⁴⁴ Bejder et al. 2006; Lusseau 2005

⁴⁵ Lusseau 2003; NMFS 2008, Bain et al. 2006; Noren et al. 2007, 2008; Williams et al. 2002, 2009

⁴⁶ Van Parijs & Corkeron 2001; NMFS 2008

⁴⁷ Jensen et al. 2009; NMFS 2008; Williams et al. 2013

⁴⁸ Romano et al. 2004

⁴⁹ Foote et al. 2004; Bain et al. 2006; Holt et al. 2008; Williams & Ashe 2006, Williams et al. 2002, 2006, 2009

⁵⁰ Erbe 2002; Lusseau 2004

⁵¹ *Federal Register* 71(229):69062

⁵² NMFS 2014, p. 8

⁵³ Hooker and Gerber 2004

⁵⁴ NMFS 2010, p.4-5; Williams et al. 2006; Ashe et al. 2009

or “warm” spots for different behaviors. For feeding, the issue will likely be settled by differences in foraging success under the current rule, versus a future WPZ that focuses on “warm” or “hot” locations for salmon. For example, SRKWs have “success” in feeding on Salmon Bank, no matter how many boats are present, since the bottom topography is very helpful (perhaps considered a “hot” spot). Conversely, off the shore of Lime Kiln State Park, SRKW feeding success is more difficult: “masking” from boat noise will matter more, but it is hard to detect (perhaps only a “warm” spot).

NMFS has indicated that a WPZ “would increase the amount of time the SRKWs spend foraging and improve their foraging effectiveness, which would allow them to locate and catch fish more easily.” “Over the long-term, better foraging conditions could contribute to an increase in the SRKW population”⁵⁵

In addition, “increased energy expenditure likely has a negative impact on the whales, particularly in light of the concerns regarding reduced prey for the whales . . . other studies . . . found short-term behavioral response can have long-term consequences for individuals and populations.”⁵⁶ These consequences may be lower birth rates, shorter life spans, problems with social cohesion, etc. “Because the Southern Residents are such a small population, improvement to the fitness of even a small number of individual whales could lead to population level effects, improving their status.”⁵⁷

Acoustic Advantages

Researchers have documented behavioral disturbance and estimated the considerable potential for auditory masking from vessels . . . as far away as 400 yards.” “. . . at 200 yards the models show auditory masking of 75-95 percent.”⁵⁸ However, there has been no detailed study of SRKW behavior since the new regulations went into effect in 2011; so we have insufficient data to determine safe vessel distance.⁵⁹

“Fewer vessels in the WPZ would also reduce the amount of acoustic masking that would occur [without a WPZ]. The combined effect of reduced vessel disturbance and reduced acoustic masking in an area heavily used by the SRKWs is likely to result in increased fitness of individuals and the population as a whole. . . .”⁶⁰

⁵⁵ NMFS 2010, p. 4-26

⁵⁶ Lusseau and Bejder 2007

⁵⁷ NMFS 2010, p. 4-17; 4-19

⁵⁸ NMFS 2010, p. P-2

⁵⁹ David Bain, personal communication, 2014

⁶⁰ NMFS 2010, p. 4-16; 4-18

Shore-side Limit

The WPZ should extend to the mean high-tide line. Currently, the SKRW Critical Habitat does not extend closer to shore than 20 feet in water depth; a majority of the commenters to the CH process requested that it do so, due to the importance of that water depth for salmon and forage fish.⁶¹

Problem Areas Requiring Detailed Analysis

Although there are often significant whale/boat interactions in Mosquito Pass (at the northern end of the proposed WPZ), the necessity for boats traveling to and from the U.S. Customs dock at Roche Harbor means that it may not be possible to include this area in the WPZ. There is a similar (although less severe) convergence of whales and boats under travel at Cattle Pass (between the southern tip of San Juan Island and Davis Point on Lopez Island). Nevertheless, each of these problematic areas should be studied in depth as part of the regulatory process.

False Bay was not originally included in the proposed WPZ, but could be included in a future WPZ, to ensure that the boundaries and prohibitions apply to all boaters in the WPZ and as further protection for the False Bay Marine Preserve.

ELEMENT B: TEMPORAL DIMENSIONS

Original NMFS Proposed WPZ

The 2009 NMFS proposed a WPZ in which no vessels would be permitted inside the zone from May 1 – September 30.
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Orca Relief's Proposed WPZ

Orca Relief recommends that the WPZ be in force *April 15 through October 15*. This preferred option encompasses the most significant period during which the SRKW's are likely to be found near San Juan Island. It allows for full use of the area at other times of the year, without jeopardizing the purposes of the WPZ.

Other options that should be analyzed in a public process:

- *Year Round*: This option is consistent, easier to remember, and affords protection during those times when the SRKW's are near San Juan Island outside of the "normal" season when they are more commonly found there.

⁶¹ Federal Register 71(229):69055

- *April 1 – October 31:* This option is also easier to remember and fully encompasses “normal” whale-watching season.

ELEMENT C: BUFFERS AND EDGE EFFECTS

Buffers

Original NMFS Proposed WPZ

NMFS did not include a speed restriction in its final 2010 regulations “because [the agency believed] it would be difficult to enforce.”⁶² NMFS determined that a “voluntary” approach recommendation should be used instead, despite its analysis showing “incidents when vessels are not following the speed guideline,”⁶³ and that “fear of penalties would likely deter whale watch operators and recreational boater from violating the regulation.”⁶⁴ The current “Be Whale Wise” guidelines still recommend that boaters slow to 7 knots within 400 yards of any single killer whale.⁶⁵

A 1/4 Mile Wide Buffer with a “No Wake” Speed Restriction

Orca Relief recommends including a 1/4- mile wide buffer outside of the 3/4- mile wide WPZ (see Map 1). A “No Wake” speed restriction would be in effect within this area (as well as the WPZ itself). A “No Wake” speed restriction will help boaters in the buffer area to “see” the WPZ boundary as they approach.

A “No Wake” Speed Restriction Throughout the Critical Habitat

In addition, Orca Relief recommends that a “No Wake” speed restriction (between 400 yards and the existing 200-yard restricted distance from the Orca) be included as part of the WPZ and throughout the Orca’s Critical Habitat. Many aspects of protecting the SRKWs are difficult, and may be present a challenge to enforce, but should nonetheless be included in new regulations accompanying a WPZ to give the highest possibility that the SRKWs can recover.

A speed restriction throughout the Critical Habitat also sends a clear message about the need for caution and attention to the needs of the Orca. As NMFS has indicated, “promulgation of a mandatory speed limit within 400 yards of whales would reduce the amount of interference with the whales’ communication and echolocation, compared with the level of compliance with voluntary [speed] guidelines” “The reduction in acoustic masking is likely to have physiological effects that increase the fitness of individual whales and the population as whole.”⁶⁶

⁶² NMFS 2010, p. P-5

⁶³ NMFS 2010, p. 2-10

⁶⁴ NMFS 2010, p. 4-20

⁶⁵ <http://www.bewhalewise.org/marine-wildlife-guidelines/>

⁶⁶ NMFS 2010, p. 4-21

Other options for speed restrictions that should be analyzed in a public process for the WPZ include a requirement that boats:

- Keep to a 5 or 7 knot speed restriction
- Travel no faster than the speed of the whales themselves inside 400 yards of any whale
- Be held to a universal speed restriction within NMFS' jurisdiction, and not connected specifically to the WPZ

Edge Effects

As NMFS has pointed out, “. . . there could continue to be some disturbance along the edge of [a WPZ], as vessels engaged in whale watching currently park or travel along the edge of the zone to view whales.”⁶⁷ This would be especially true at the north or south ends of the long narrow protected area, where whale waters and other boaters would be able to come to within 200 yards of the whales after having been required to stay as much as 600-800 yards away.

“No matter where [a] line is drawn to delineate a specific area, there will be activities occurring outside of the delineated area that may affect the features within the area. When prey items are a biological feature that moves freely in and out of the geographical area occupied by the species [as would be the case with the WPZ], it creates a situation in which there is a “biological feature” outside the occupied specific areas. This fact does not make line-drawing arbitrary because the statute requires [NMFS] to designate as Critical Habitat specific areas occupied by the species that contain those physical and biological features essential to conservation and may require special management considerations or protection.”⁶⁸

Particularly at the northern end of a WPZ there will need to be special requirements (and enforcement) that ensure that boats do not park right at the top edge of the WPZ waiting for whales to emerge, and then rush in to gather around at the 200-yard limit (the “No Wake” speed restriction would help reduce this problem; vessels will still be required to stay at least 400 yards away and not park in the path of the whales' travel). This should be an important area of study during the WPZ public process.

⁶⁷ NMFS 2010, p. 4-16

⁶⁸ *Federal Register* 71(229):69055

ELEMENT D: ADDITIONAL SECTIONS OF THE WPZ AND CONNECTIONS TO PROTECTION NETWORKS**Including Other Islands or Areas**

Orca Relief recommends that other areas be considered in depth: particularly Stuart Island (Turn Point), Hood Canal, and Vashon Island (west side), for future additions to the WPZ.

WPZ As Part of the “Whale Trail”

Orca Relief is committed to shore-based whale watching. We recommend that the WPZ have a significant role in the Whale Trail system (see Map 5), a series of sites around the Northwest and the Pacific coast where the public may view Orcas, other whales, and marine mammals from shore. At the center of the WPZ is Limekiln Lighthouse State Park, which has also been named “Whale Watch Park” because of the exceptional prospect to see Orcas and other marine wildlife up very close from shore.

National Wildlife Refuges

The WPZ would overlap with some parts of the San Juan Island National Wildlife Refuge (SJINWR); extensions of the WPZ could also include the rest of the SJINWR as well as the Protection Island NWR and the Dungeness NWR. Currently within NWRs, boaters are advised to maintain a distance of 200 yards to avoid disturbing marine mammals and birds (see Map 6).

ELEMENT E: ADDITIONAL REGULATORY COMPONENTS**Permit Systems (Licenses), Especially in the Core Critical Habitat**

A system of permits or licenses for commercial whale watching, combined with education programs (see below), would go a long way toward ensuring that the whale watching fleet (and the private whale watchers the fleet attracts and for which the fleet sets the example) does indeed adhere to the WPZ and other regulations designed to protect the SRKW. Therefore a permit system should be included as part of the regulatory system for managing whale watching in Washington State waters, particularly inside the core Critical Habitat for SRKWs. In particular, ORCA recommends careful consideration of licenses based on meeting noise level standards (expressed in terms of distance and speed) that meet strict acoustic thresholds.

In its 2010 regulatory proposal, NMFS would have permitted commercial whale watch operators, but (presumably in exchange for accepting the permit system) allowed permit holders to approach closer than other boaters.⁶⁹ The original idea could have also limited how many permit holders were close at any

⁶⁹ NMFS 2010, p. 2-8

one time. At that time, NMFS stated that it had decided not to include such a permit system because of the large infrastructure to administer, monitor, and enforce; because of equity issues; and because it would have been especially confusing to recreational boaters.⁷⁰ However, with the decline of the SRKWs to 77 whales, this financial consideration must be revisited.

Perhaps the most important outcome of developing a permit system is that greater use of Critical Habitat protections could possibly be invoked if the permits were issued, at least in part, by the federal government.

Observer Systems

Serious consideration should be given to a system that requires observers on each commercial whale watch boat. Currently, 47 US fisheries have required observers which enables much more careful management of fish stocks and provides invaluable data for research and management decision-making.⁷¹ NMFS has many years of experience with such systems, so a new system for Puget Sound whale watching could be designed and implemented relatively easily.

A shore-based observer system should also be considered, as well as additional funding for the Soundwatch program (a program of the Whale Museum that seeks to promote responsible boater behavior around wildlife).⁷²

Equipment Options

Automated Identification Systems (AIS) should be required for all commercial vessels; these devices would enable enforcement boats to know the location of the whale watching and fishing fleets. They are easily available, increasingly less expensive, and eventually all vessels will be required to use them in any case.

Air Quality

There is increasing concern about the air pollution experienced by the SRKWs. Significant deterioration of air quality has been documented from the exhaust emissions of the whale watching fleet and the other boats they attract.⁷³ Regulatory control of the exhaust emitted by the types of engines used by commercial and recreational whale watching boats might be possible using EPA authority. It might additionally be possible to phase in a requirement that permit holders use electric (or hybrid) motors.

⁷⁰ NMFS 2010, p. 2-8

⁷¹ See <http://www.st.nmfs.noaa.gov/observer-home/>

⁷² See <http://whalemuseum.org/pages/soundwatch-boater-education-program>

⁷³ Lachmuth et al. 2011

Possible Changes to Shipping Lanes

NMFS did not include rerouting shipping in its 2010 regulations because the ships “are rarely within ½ mile of the whales, and very few incidents are reported in the shipping lanes”, and there would be “significant economic and public safety impacts.”⁷⁴ While we recognize the difficulties and costs involved in changing the shipping lanes, careful study of this issue should be included in the public process to ensure that the existing lanes do not diminish the protection provided by the WPZ. This is will be especially crucial in advance of any increase in the number of coal and oil shipments through the Puget Sound and Salish Sea.

Variable Regulations Within the WPZ

Orca Relief recognizes the challenges inherent in delineating a WPZ with different rules for different types of vessels. Nevertheless, the following considerations should be included because each of the different vessels types can have a very different effect on SRKWs. Once the WPZ is in place, careful research should be conducted over a number of years to determine if changes need to be made to any of these exceptions.

Commercial and Recreational Fishing. Fishing should be allowed in the WPZ. ORCA recommends that both commercial and recreational fishing boats be allowed to transit through, and fish in, the WPZ , adhering to the “No Wake” speed requirement (and of course to the current 200 and 400 yard boat separation requirements).

Kayaks. ORCA recommends that kayaks be allowed to operate within a specified subzone of the WPZ. However, the design and enforcement of the subzone must be carefully considered. “Williams et al. (2010) analyzed impacts of kayaks on [NRKWs] and reported that kayaks can have significant impact on killer whale behavior. Killer whales exhibited increased probability of traveling behavior, which indicates an avoidance tactic, and decreased feeding activities when kayaks were present.”⁷⁵ Detailed discussions with kayak excursion companies must be held to determine the specifics of how kayaks can operate within the WPZ and still meet the existing regulations and the Kayak Education Leadership Program (KELP) guidelines.⁷⁶

Other. All other types of vessels should be required to adhere to the “No Wake” speed requirement and to the current 200 and 400 yard boat separation requirements.

⁷⁴ NMFS 2010, P-6, 2-7; Koski 2006, 2007

⁷⁵ NMFS 2010, p. P-8

⁷⁶ http://cdn.shopify.com/s/files/1/0249/1083/files/KELP_brochure_2011R.pdf?6603

ELEMENT F: COMPLIANCE MONITORING AND ENFORCEMENT

Monitoring of compliance with the WPZ regulations and then enforcement of infractions will be critical to the success of this protected area. Effective enforcement of the WPZ will in turn depend on sufficient funding and engagement by NMFS, and especially the Washington Department of Fish and Wildlife.

NMFS has noted that “fear of sanctions is a stronger motivation for compliance with mandatory rules rather than voluntary guidelines. . . .” “Inspections and enforcement actions, as well as publicizing or ‘showcasing’ enforcement actions, which may cause embarrassment, can contribute to effective deterrence.”⁷⁷ “Commercial operators would also be motivated to avoid monetary impact on their economic status from penalties charged for violations of regulations. There may, however, also be economic incentives for commercial whale watch operators not to comply with mandatory regulations. They may believe they will attract more customers or that customers would be willing to pay more if their tours result in close contact with the whales, closer than is allowed by guidelines or rules.”⁷⁸ The following approaches can help address this issue.

Shore-based Video and/or Listening Stations for Enforcement

Shore-based monitoring of the WPZ (both by the state and federal government and by non-profit organizations) could aid the enforcement of the WPZ a great deal and should be studied in depth by NMFS during the regulatory process.

Labeling and Signs

Signs, flags, and electronic signals should be employed to notify boats when they are approaching and entering the WPZ. These technologies are already used in other jurisdictions and should be studied in depth for the WPZ.

Joint Enforcement Agreement

Orca Relief strongly encourages NMFS and Washington State to continue and strengthen their Joint Enforcement Agreement to include enforcement of the WPZ.

Harmonization with Canada

Initially, Washington State and NMFS should work with British Columbia to develop joint campaigns for education, monitoring, and enforcement, which should be highly publicized on both sides of the border. In parallel, there need

⁷⁷ NMFS 2010, p. 4-2

⁷⁸ NMFS 2010, p. 4-4

to be efforts to harmonize the regulations so that commercial and recreational whale watch boats are held to the same standards, regulations, and enforcement throughout the SRKWs' range. This might also help the Northern Resident Killer Whales.

ELEMENT G: EDUCATION

The WPZ provides an excellent platform for education directed toward SRKWs – their endangered status, the need for people to be cautious and respectful when near them, and the necessity for regulatory restrictions in our use of Orca as objects of recreation. “Regardless of the regulatory impact of a protected area, they all have some value in education and outreach. Protected areas for marine mammals have been effective in raising awareness of important areas for species, encouraging coordination and funding of research, and other non-regulatory activities”⁷⁹ (Reeves 2002).

Nautical Charts

The WPZ should be included in new editions (both electronic and hard copy of nautical charts. Electronic versions could easily have “pop-up” announcements that a vessel is approaching/entering the WPZ; most vessels now have electronic plotting capabilities. Critical Habitat should be noted as an “alert” area; the WPZ notice should include details on the requirements within the zone. “Protected areas that are identified with coordinates on navigation charts are easy to understand, and education regarding the location and reasons for protection can increase compliance (NMPAC 2005). Formal recognition of protected areas can also aid in achieving compliance.”⁸⁰

Notice to Mariners

NMFS has already recognized the reason to include the WPZ in notices to mariners. “A [WPZ] is clear and could be readily avoided by both commercial and recreational boaters. The area would be identified using latitude and longitude coordinates and landmarks on maps and charts, making compliance and enforcement straightforward.”⁸¹

Washington State Fishing Regulations

Details on the location and regulations concerning the WPZ should be included in both electronic and hard-copy versions of the fishing regulations.

⁷⁹ NMFS 2010, p. 4-5

⁸⁰ NMFS 2010, p. 4-5

⁸¹ NMFS 2010, p. 4-18

Signs

Canada has an effective system of signs and symbols for wildlife areas and other protected area that could be replicated for the WPZ. It is common for there to be “No Wake Zone” signs in harbors and protected areas.

Coast Guard and State Boater Education

All programs of boater education and safety should include information on the WPZ and Orca Critical Habitat (and other marine protected areas) as standard. Notices should also go out on social media and through the Washington State Boater Education program. Washington State and the U.S. and Canadian Coast Guard should make announcements to mariners on a regular schedule reminding them of the WPZ and its requirements. Changes will need to be made to the “Be Whale Wise” guidelines.

Phone Apps and Social Media

NMFS should recognize that on social media, protection of the SRKW is competing with whale watching. A phone app should be developed that tells the WPZ story and provides the regulations.

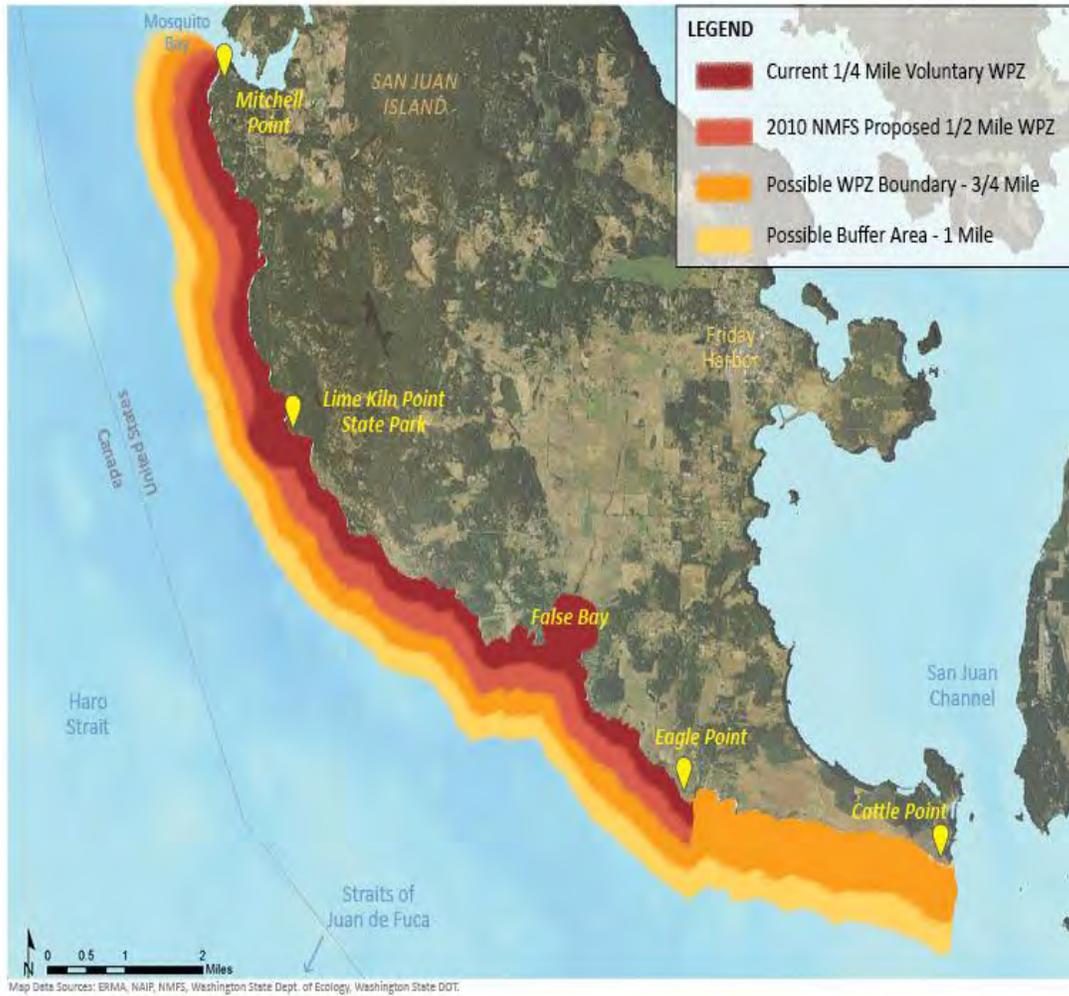
KELP Education Programs

The Kayak Education & Leadership Program (part of the Whale Museum’s Soundwatch Boater Education Program) has both written and verbal education for kayakers, which are very specific about kayak behavior around killer whales. KELP materials and programs should be reviewed to reflect details of how kayaking should be undertaken within the WPZ.

MAPS

MAP 1. ORCA RELIEF CITIZENS' ALLIANCE PROPOSED WPZ

Map by Marie Macchiarollo

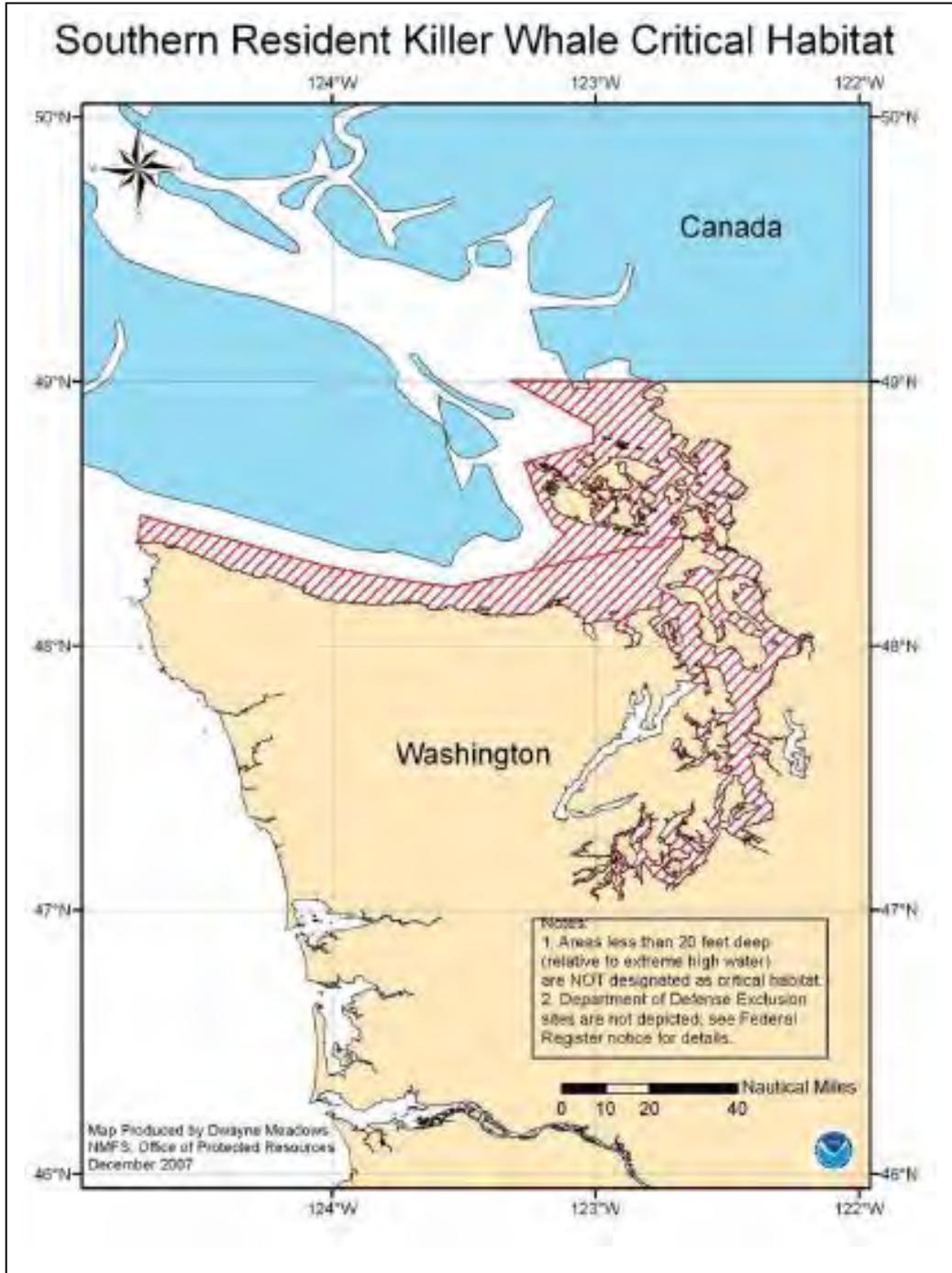


MAP 2. CURRENT VOLUNTARY WPZ



Current voluntary no-go zone, a 1/2 mile (800 meter)-wide zone centered on the Lime 2 Kiln lighthouse and a 1/4 mile (400 meter)-wide zone from Eagle Point to Mitchell Point 3 (approximately 3.8 square miles). (NMFS 2010, pp. 2-4)

MAP 3. SRKW CRITICAL HABITAT



MAP 4. ORIGINAL NMFS PROPOSED WPZ (2010)

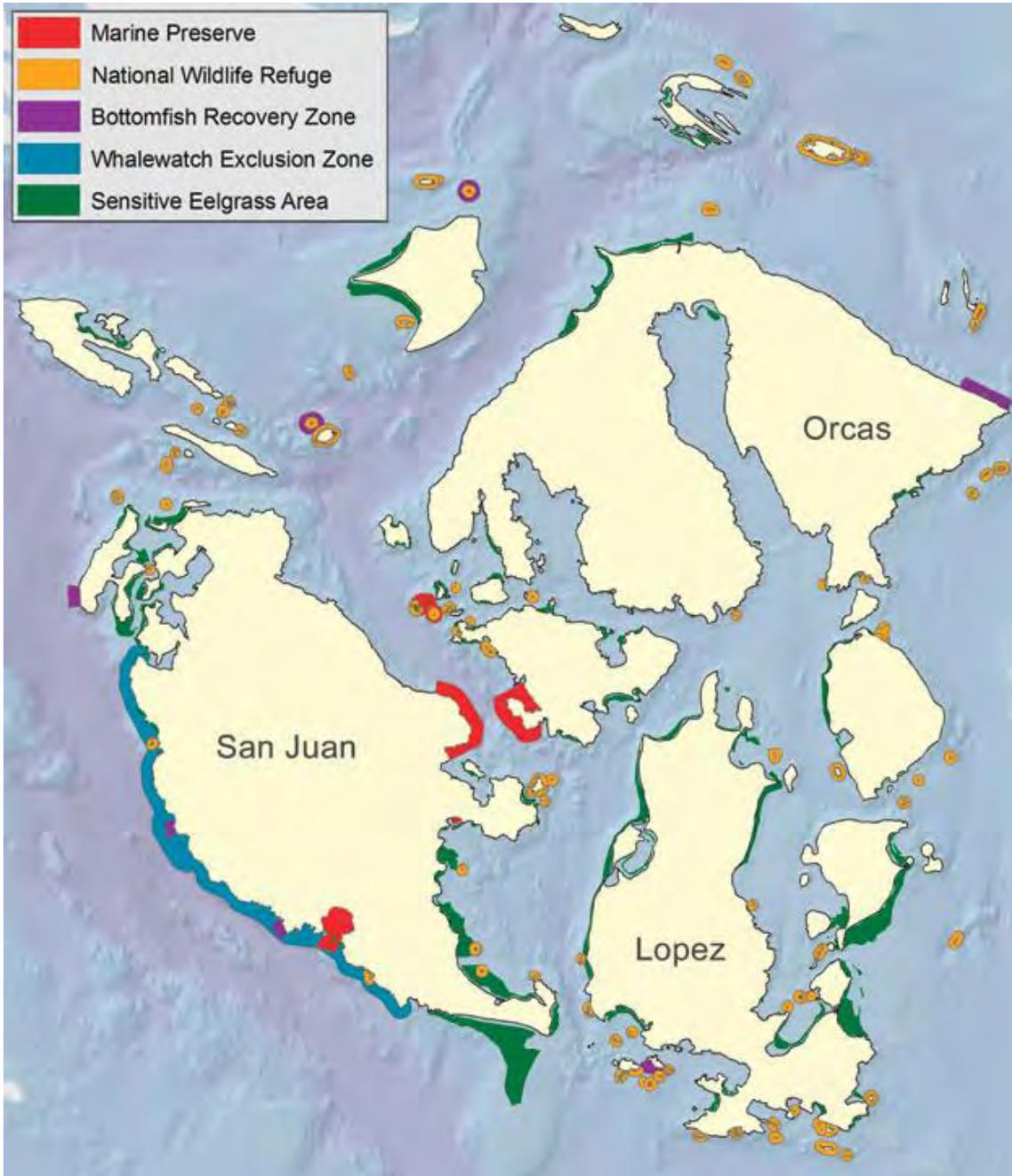


Expanded no-go zone 1/2 mile (800 meters) offshore from Eagle Point to Mitchell Point 2 (approximately 6.2 square miles) not including False Bay. (NMFS 2010, pp. 2-5)

MAP 5. THE WHALE TRAIL



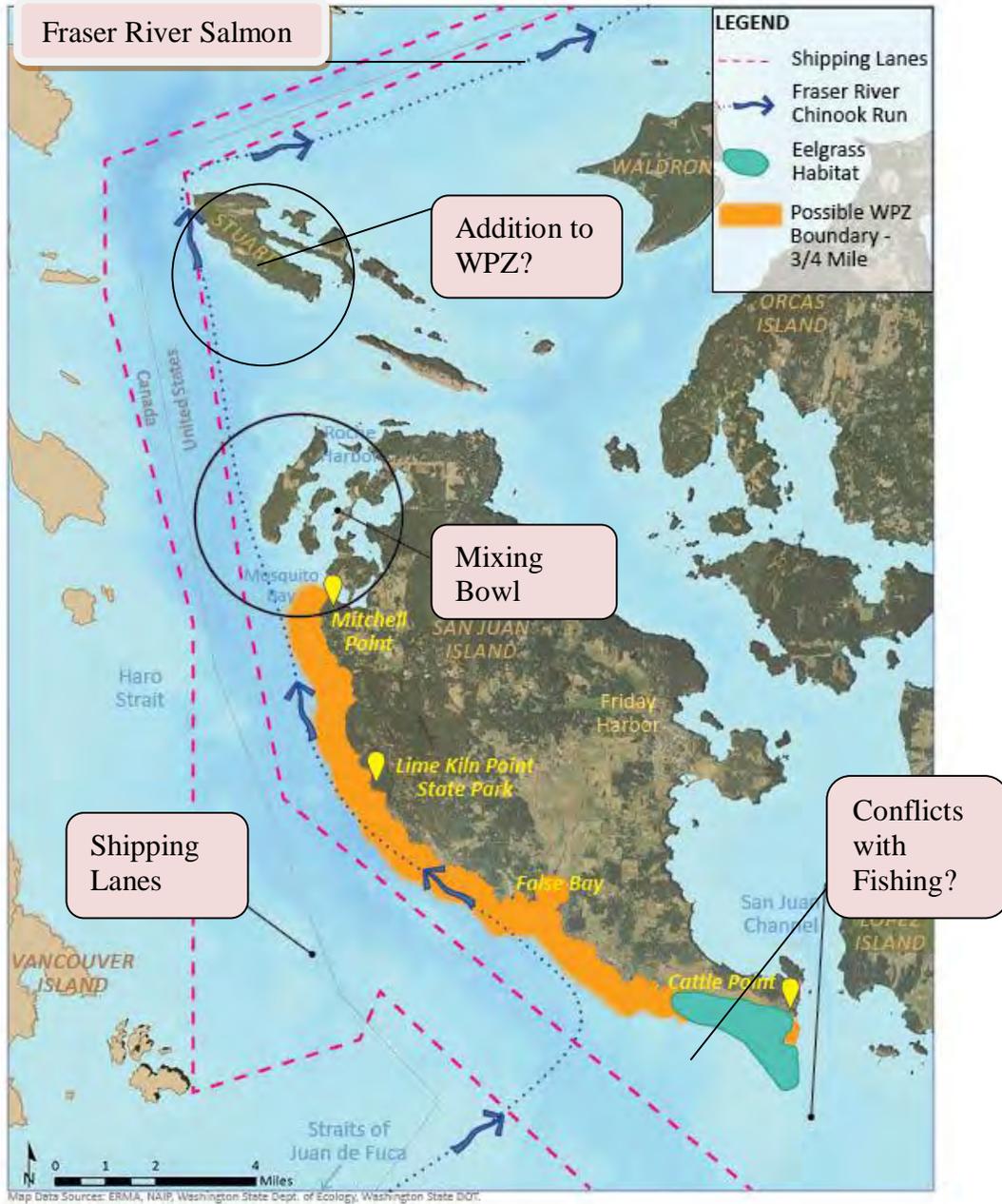
MAP 6. OTHER PROTECTED AREAS NEAR THE PROPOSED WPZ



San Juan County Marine Resources Committee, 2007, p. 11

**MAP 7. ORCA RELIEF CITIZENS' ALLIANCE PROPOSED WPZ,
WITH KEY ISSUES TO ADDRESS**

Map by Marie Macchiarollo



APPENDIX A: MARCH 2014 WORKSHOP PARTICIPANTS**Researchers**

David Bain, independent
Kari Koski, University of Washington
Cara Lachmuth, University of British Columbia
Tim Ragen, independent
Sarah Uhlemann, Center for Biological Diversity
Val Viers, independent

Orca Relief Citizens' Alliance

Mark Anderson, President
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Catherine Cougan

National Marine Fisheries Service

Lynne Barre Branch Chief, Protected Resources Division, Northwest Region
Marla Holt, Research Wildlife Biologist, Marine Mammal Ecology Team
Dawn P. Noren, Research Fishery Biologist, Northwest Fisheries Science Center

Note: NMFS participants attended only the first day of the two-day workshop. They presented valuable up-to-date information about the status of the SRKWs and the history of the regulatory process. They did not, however play a role in developing the ideas developed by the workshop on the second day, which are presented in this document.

APPENDIX B: REGULATORY HISTORY OF A WPZ**NMFS Has Been Considering a WPZ since at Least 2007**

In its recovery planning, NMFS “identified vessel effects as a risk factor in the decision to list the Southern Residents,”⁸² and one goal was to “minimize disturbance of Southern Residents from vessels.”⁸³ NMFS published an Advance Notice of Proposed Rulemaking in 2007 to gather information that would assist in establishing protective regulation. The agency’s proposed regulations published in 2009 included a prohibition on “motorized, non-motorized, self-propelled, and human-powered vessels” from “entering a restricted zone along the west coast of San Juan Island during a specified season.”⁸⁴

⁸² NMFS 2010, E-1

⁸³ NMFS 2010, E-1

⁸⁴ *Federal Register* 74(144):37674

On April 14, 2011, NMFS established a Final Rule under the Endangered Species Act and Marine Mammal Protection Act (based on a 2010 environmental assessment⁸⁵) which was intended to protect the SRKWs from vessel impacts in Puget Sound.⁸⁶ While those regulations established a 200-yard separation of vessels from individual whales, and proscribed “parking in the path” of the whales,⁸⁷ NMFS did not include the originally proposed restricted Whale Protection Zone⁸⁸ on the west side of San Juan Island. As proposed by NMFS, the formalized protection zone would have been a ½ mile wide zone from Eagle Point to Mitchell Point on the west side of San Juan Island,⁸⁹ with no vessels permitted inside the zone from May 1 – September 30.⁹⁰

Chronology of the Regulatory Process

2001. Center for Biological Diversity (and others) petitioned NMFS to list SRKWs as “endangered” under ESA.

2002. NMFS determined that SRKWs were not eligible for “endangered” status.

2002. NMFS completed SRKW status review.

2002. Advance Notice of Proposed Rulemaking (national scope)⁹¹ “specifically mentioned the complaints received from researchers and members of the public concerning close vessel approaches to killer whales in the Northwest.”

2003. NMFS formed a scientific team to study SRKW “risk factors” and data gaps (including noise and disturbance).

2003. SRKWs declared “depleted” under Marine Mammal Protection Act.

2003. Court ordered NMFS to reconsider “endangered” eligibility for ESA listing.

2003-4. NMFS held workshops to consider research needs on vessel interactions (among other topics).

2004. WA Department of Fish and Wildlife completed SRKW status report; listed SRKWs as “endangered.”

2005. SRKWs listed as Endangered [Population], 18 November.⁹² Disturbance from sound and vessel traffic is given as a significant factor.

⁸⁵ NMFS 2010

⁸⁶ *Federal Register* 76(72):20870-20890

⁸⁷ “prohibit vessels from approaching killer whales within 200 yards (182.9 m) and from parking in the path of whales when in inland waters of Washington State.” *Federal Register* 76(72):20870

⁸⁸ The proposed regulations referred to the proposed protected area as a “No-Go-Zone”

⁸⁹ See map at NMFS 2010, 2-5

⁹⁰ Since 2007 there has been a voluntary protection zone off the west side of San Juan Island, ½ mile wide centered on Lime Kiln Lighthouse, and ¼ mile wide from Eagle Point to Mitchell Point with no vessels permitted inside the zone from May 1 – September 30 (see Map 2)

⁹¹ *Federal Register* 67:4379

⁹² *Federal Register* 70:69903

2006. Proposed Recovery Plan includes as a management action the evaluation of whether protected areas are needed.

2006. NMFS designated Critical Habitat for SRKWs in inland Washington waters.⁹³

2007. Advance Notice of Proposed Rulemaking. ⁹⁴ “NMFS is concerned that some whale watch activities may cause unauthorized taking of killer whales or cause detrimental individual-level and population-level impacts.”

2007. San Juan County Council local ordinance (No.35-2007). “Unlawful” to approach within 100 yards.

2008. Washington State Regulations (RCW 77.15.740).

2008. Final SRKW Recovery Plan (NMFS 2008) recommends evaluating the need to establish restricted areas.

2009. Proposed Rule. ⁹⁵ “NMFS is concerned that some whale watching activities may harm individual killer whales, potentially reducing their fitness and increasing the population’s risk of extinction.”

2009. Killer whale response plan added to Northwest Area Contingency Plan for oil spill response.

2010. NMFS 5-year Status Review. No status change deemed needed.

2010. Final Environmental Assessment for New Regulations to Protect Killer Whales from Vessel Effects in Inland Waters of Washington. RIN 0648-AV15. NMFS. The WPZ was analyzed as Alternative 5. It was not included as part of the Preferred Alternative nor the final Protective Regulations “[b]ecause of the many alternatives suggested by the public [and which NMFS did not [‘fully analyze’ in the EA], and because of the degree of public opposition” (NMFS 2010, P-4).

2011. (14Apr). Protective Regulations for Killer Whales in the Northwest Region Under the Endangered Species Act and Marine Mammal Protection Act.

2014. NMFS indicates that they will take vessel impacts “into consideration when determining the need for additional conservation actions, such as a protected area” (NMFS 2014, 20).

⁹³ *Federal Register* 71:69054

⁹⁴ *Federal Register* 72(55):13464

⁹⁵ *Federal Register* 74(144):37674

APPENDIX C: MARINE PROTECTED AREA EXAMPLES

(Hoyt 2005, 2011 – from which all quotes are taken)

The case of the SRKWs in Puget Sound and the Salish Sea is essentially unique, combining a constrained body of water, very easy access to the whales by commercial and recreational whale watching vessels, and specific locations where SRKWs are typically found. Nevertheless, the examples below merit close study by NMFS and others in development of a WPZ for Puget Sound.

These examples are included because they currently protect (or could protect) killer whales (*O. Orca*), and/or in some cases other dolphins and porpoises. The focus here is on protected areas that are smaller than 125 square miles (with one exception). Attention is also given to protected areas in relatively enclosed bodies of water. These sites merit detailed study, to yield valuable information on approaches to management and enforcement as well as protected area design.⁹⁶

NOTE: the proposed Orca WPZ will be 10.0-12.0 square miles (26.0- 31.1 square kilometers).

Best Pacific Northwest Example and Model

- **Robson Bight / Michael Bigg Ecological Reserve**, Canada. 4.7 mi² (12.5 km²). {*O. Orca*} [“whale watchers and sports fishermen are kept out”; see other comments p.331]

Other Currently Existing or Proposed Protected Areas (ordered by size)

- **San Juan Islands National Wildlife Refuge**, U.S. Size undetermined. {*O. Orca*, *L. obliquidens*, *P. phocoena*, *P. dalli*} [“. . . the marine component . . . is not enough to protect cetaceans, but if extended could protect Critical Habitat.”]
- **Lancaster Sound NMCA**, Canada, *proposed*. Size undetermined. {*O. Orca*, *M. monoceros*, *D. leucas*} [“. . . area of high primary productivity as well as a crucial migratory and feeding area.”]
- **Race Rocks Candidate “Marine Protected Area,”** Canada, *proposed*. 0.85 mi² (2.2 km²). {*O. Orca*, *P. dalli*, *P. phocoena*} [“minimal habitat protection for cetaceans because of the limited size.”]
- **Punta Loma Faunal Reserve**, Argentina. 6.6 mi² (17.1 km²). {*O. Orca*, *L. obscurus*} [“Existing conflicts include high visitor numbers, water

⁹⁶ A careful look at Hoyt 2011 will likely reveal other examples worthy of detailed study, especially those with long experience protecting killer whales or other dolphins, even if they are larger than the proposed WPZ.

- contamination, shipping traffic and increasing fishing activity in the area.”]
- **Port Cros National Park**, France. 7 mi² (18 km²). {*T. truncates*, *S. coeruleoalba*}
 - **Ventotene and Santo Stefano Island MPA**, Italy. 11 mi² (28 km²). {*many dolphin spp.*} [“Research on cetaceans includes photo-ID of bottlenose dolphins, acoustic tracking and recording, as well as the implications of habitat use outside MPA boundaries.”]
 - **Pelagie Islands MPA**, Italy. 12 mi² (32 km²). { *T. truncates* } [Research on cetaceans includes photo-ID studies”]
 - **Swallow Cay Wildlife Sanctuary**, Belize. 14 mi² (36.3km²). {*T. truncates*}
 - **Capo Carbinara MPA**, Italy. 34 mi² (89 km²). {*T. truncatus*} [no management plan, only a zoning plan. “Cetacean research has been photo-ID, acoustic tracking, and recording of bottlenose dolphin.”]
 - **Asinara Island MPA**, Italy. 41 mi² (107km²). { *T. truncates*, *D. delphis* } [“ . . . research on cetaceans here has utilized photo-ID studies . . . as well as acoustic tracking and recording.”]
 - **Nalychevo Nature Park and Marine Nature Reserve**, Russia. 47.5 mi² (123 km²). { *O. Orca* } [Cetacean surveys still needed.]
 - **Nirjutiqavvik (Coburg Island) National Wildlife Area**, Canada, *proposed for higher level protection*. 55 mi² (143 km²). {*M. monoceros*} [Activities in the area “ . . . can be done with permits.”]
 - **Tavolara and Punta Coda Cavallo MPA**, Italy. 58 mi² (151 km²). {*T. truncates*, *D. delphis*, *S. coeruleoalba* } [“Cetacean research has been photo-ID”]
 - **Poronayskiy Nature Reserve**, Russia. 67 mi² (173 km²). {*O. Orca*}
 - **Pacific Rim National Park Reserve**, Canada. 85.1 mi² (220.5 km²). {*O. Orca*, *P. dalli*} [WW, photo-ID in place; “concerns exist over the cumulative effect of resource use on the whale (from whale watching, other boat traffic). . . Marine wildlife operators are required to follow species and site-specific viewing guidelines.”]
 - **Sado Estuary Natural Reserve**, Portugal. 90 mi² (232 km²). {*T. truncates*, *P. pheocena*} [Photo-ID in place. “Ship traffic and urban congestion present serious risks to this estuarine ecosystem.”]

- **Tysfjour and Hellemofjord MPA**, Norway, *proposed*. 121 mi² (314 km²). {*O. Orca*}
- **Golfo San Jose Provincial Marine Park**, Argentina. 255 mi² (660 km²). {*O. Orca*, *L. obscurus*} ["The law was modified . . . to allow . . . whale watching."]

REFERENCES

Apostolaki, P.E., *et al.* 2002. Modeling the effects of establishing a marine reserve for mobile fish species. *Canadian Journal of Fisheries and Aquatic Science* 2(1).

Ashe, E., D.P. Noren and R. Williams. 2009. Animal behavior and marine protected areas: incorporating behavioral data in to the selection of marine protected areas for an endangered killer whale population. *Animal Conservation* 13:196-203.

Bain, *et al.* 2006. *Effects Of Vessels On Behavior Of Southern Resident Killer Whales (Orcinus spp.)*. NMFS Contract Report Nos. AB133F03SE0959 and AB133F04CN0040.

Bain, *in press*. A model linking energetic effects of whale watching to Killer Whale population dynamics. Orca Relief Citizens' Alliance website.

Bejder, *et al.* 2006. Decline in Relative Abundance of Bottlenose Dolphins Exposed to Long-Term Disturbance. *Conservation Biology* 20(6):1791-1798.

Center for Biological Diversity. 2014 (16 January). "Petition to Revise the Critical Habitat Designation for the Southern Resident Killer Whales (*Orcinus Orca*) under the Endangered Species Act."

Constantine, *et al.* 2004. *Southern Resident Killer Whales (Orcinus Orca) 5-year Review: Summary and Evaluation*. NMFS, NW Region, Seattle, WA.

Erbe 2002. Underwater noise of whale-watching boats and potential effects on killer whales (*Orcinus Orca*), based on an acoustic model. *Mar. Mamm. Sci.* 128:394-418.

Foote, *et al.* 2004. Whale-call response to masking boat noise. *Nature* 428 (April 29):910.

Holt, *et al.* 2008. Speaking up: killer whales increase their call amplitude in response to vessel noise. *JASA Express Letters* 125:EL27-EL32.

Hooker, S.K., and L.R. Gerber. 2004. Marine reserves as a tool for ecosystem-based management: the potential importance of megafauna. *BioScience* 54 (1):27-39.

Hoyt, E. 2005. *Marine Protected Areas for Whales, Dolphins and Porpoises. A World Handbook for Cetacean Habitat Conservation.* Earthscan. London, Sterling, VA.

Hoyt, E. 2011 (2nd Edition). *Marine Protected Areas for Whales, Dolphins and Porpoises. A World Handbook for Cetacean Habitat Conservation and Planning.* Earthscan. London, New York.

Jensen, *et al.* 2009. Underwater noise of whale-watching boats and potential effects on killer whales (*Orcinus Orca*), based on an acoustic model. *Marine Mammals Science* 18(2):394-418.

Koski, K. 2006. *Final program report (2004-5): Soundwatch Public Outreach / Boater Education Project.* The Whale Museum, Friday Harbor, Washington. 25 pages.

Koski, K. 2007. *Final program report (2006): Soundwatch Public Outreach / Boater Education Project.* The Whale Museum, Friday Harbor, Washington. 39 pages.

Kriete, B. 2002. Biogenetic changes from 1986 to 2001 in the Southern Resident Killer Whale population, *Orcinus Orca*. Orca Relief Citizens' Alliance website.

Lachmuth, Cara L. *et al.* 2011. Estimation of Southern Resident Killer Whale exposure to exhaust emissions from whale-watching vessels and potential adverse health effects and toxicity thresholds. *Marine Pollution Bulletin* 62:792.

Lusseau, D. 2003. The effects of tour boats on the behavior of bottlenose dolphin. *Conservation Biology* 17:1785-1793.

Lusseau, D. 2004. The hidden cost of tourism: detecting long-term effects of tourism using behavioral information. *Ecology and Society* 9(1): 2. [online]

Lusseau, D. 2006. The Short-Term Behavioral Reactions of Bottlenose Dolphins to Interactions with Boats In Doubtful Sound, New Zealand. *Science* 22(4):802-818.

Lusseau, D., and L. Bejder. 2007. The short-term behavioral reactions of bottlenose dolphins to interactions with boats in Doubtful Sound, New Zealand. *Marine Mammal Science* 22(4):802-818.

Lusseau, *et al.* 2009. Vessel traffic disrupts the foraging behavior of southern resident killer whales, *Orcinus Orca*. *Endangered Species Research* 6:211-221.

Mattson, *et al.* 2005. Effects of Boat Activity on the Behavior of Bottlenose Dolphins (*Tursiops truncatus*) in Waters Surrounding Hilton Head Island, South Carolina.

Musser, Whitney B., *et al.* 2014. Cross-species vocal learning in killer whales. *The Journal of the Acoustic Society of America* 136(4):1990-2002.

Noren, D.P., *et al.* 2009. Close approaches by vessels elicit surface active behaviors by southern resident killer whales. *Endangered Species Research* 8:179-192.

NMFS 2008. *Recovery Plan for Southern Resident Killer Whales (Orcinus Orca)*. National Marine Fisheries Service, Northwest Region, Seattle, Washington.

NMFS 2010. *Final Environmental Assessment for New Regulations to Protect Killer Whales from Vessel Effects in Inland Waters of Washington*. RIN 0648-AV15.

NMFS 2014. *Southern Resident Killer Whales. 10 Years of Research & Conservation*. National Marine Fisheries Service, Northwest Region, Seattle, Washington. http://www.nwfsc.noaa.gov/news/features/killer_whale_report/

Roberts, C.M., and H. Sargant. 2002. Fishery benefits of fully protected marine reserves: Why habitat and behavior are important. *Nature Resource Modeling* 14(4):487-507.

Romano, *et al.* 2004. Anthropogenic sound and marine mammal health: measures of the nervous and immune systems before and after intense sound exposure. *Canadian Journal of Fisheries and Aquatic Science*. 61:1124-1134.

San Juan County Marine Resources Committee. 2007. *Report. Public and Marine Managers review as part of the San Juan County Marine Stewardship Area Plan*.

Van Parijs & Corkeron. 2001. Boat traffic affects the acoustic behavior of Pacific humpback dolphins. *Journal of the Marine Biology Association of the United Kingdom* 81:533-538.

VanBlaricom & Alvares-Flores. 2001. Evaluation of factors influencing the population dynamics of the SRKWs. Orca Relief Citizens' Alliance website.

Williams R., & E. Ashe. 2006. *Northern Resident Killer Whale Responses to Vessels Varied with Number of Boats*. Final report to NOAA Fisheries for Contract AB133F04SE0736.

Williams R., & E. Ashe. 2007. Killer whale evasive tactics vary with boat number. *Journal of Zoology* 272: 390-397.

Williams, R., E. Ashe, and D. Lusseau. 2010. Killer whale activity budgets under no-boat, kayak-only and power-boat conditions. Contract via Herrera Consulting, Seattle, Washington. 29 pages.

Williams, R., D. Lusseau, and P.S. Hammond. 2006. Estimating relative energetic costs of human disturbance to killer whales (*Orcinus Orca*). *Biological Conservation* 133:301-311.

Williams, R., & D.P. Noren. 2009. Swimming speed, respiration rate, and estimated cost of transport in adult killer whales. *Marine Mammal Science* 25: 327-350.

Williams, R., *et al.* 2002. Animal behavior and marine protected areas: incorporating behavioral data into the selection of marine protected areas for an endangered killer whale population. *Animal Conservation*. Zoological Society of London 1/8/2013.

Williams, R., *et al.* 2006. Estimating relative energetic costs of human disturbance to killer whales (*Orcinus Orca*). *Biological Conservation* 133:301-311.

Williams, R., *et al.* 2009a. Effects of vessels on behavior patterns of individual southern resident killer whales *Orcinus Orca*. *Endangered Species Research* 6: 199-209.

Williams, R., *et al.* 2009b. Swimming speed, respiration rate, and estimated cost of transport in adult killer whales. *Marine Mammal Science* 25:327:350.

Williams, Rob, *et al.* 2013. Severity of killer whale behavioral response to ship noise: A dose response study. *Marine Pollution Bulletin* 1.

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