Designation of Critical Habitat for Southern Resident Killer Whales

Section 4(b)(2) Report

October 2006

NATIONAL MARINE FISHERIES SERVICE
Northwest Region

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This report contains NOAA Fisheries, Northwest Region's recommendations for designating critical habitat under section 4 of the Endangered Species Act (ESA) for the Southern Resident killer whale distinct population segment, which we listed under the ESA on November 18, 2005 (70 FR 69903). Critical habitat was proposed on June 15, 2006 (71 FR 34571). It describes the methods used, process followed, and conclusions reached for each step leading to the recommendation.

I. Statute and Regulations

We developed our recommendations consistent with statutory requirements and agency regulations, which are summarized below.

Findings and purposes of the Act emphasize habitat conservation

In section 1 of the ESA, "Findings," (16 U.S.C. 1531(a)(1)) Congress declared that:

> Various species of fish, wildlife and plants in the United States have been rendered extinct as a consequence of economic growth and development untempered by adequate concern and conservation.

Section 2 of the ESA sets forth the purposes of the Act, beginning with habitat protection:

> The purposes of this chapter are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes of the treaties and conventions set forth in subsection (a) of this section.

"Critical Habitat" is specifically defined

Section 3(5)(A) of the ESA (16 U.S.C. 1532 (5)) defines critical habitat in some detail.

> (5)(A) The term "critical habitat'' for a threatened or endangered species means –
>
> (i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 1533 of this title, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and
>
> (ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 1533 of this title, upon a determination by the Secretary that such areas are essential for the conservation of the species.
>
> (B) Critical habitat may be established for those species now listed as threatened or endangered species for which no critical habitat has heretofore been established as set forth in subparagraph (A) of this paragraph.

(C) Except in those circumstances determined by the Secretary, critical habitat shall not include the entire geographical area which can be occupied by the threatened or endangered species (emphasis added).

"Conservation" is specifically defined

Section 3(3) of the Act defines conservation (16 U.S.C. 1532(3)):

> (3) The terms "conserve", "conserving", and "conservation" mean to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this chapter are no longer necessary.

Certain military lands are precluded from designation

In 2003 Congress amended section 4(b)(1) of the ESA to limit the designation of land controlled by the Department of Defense (National Defense Authorization Act, P.L. No. 108-136):

> The Secretary shall not designate as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense, or designated for its use, that are subject to an integrated natural resources management plan prepared under section 101 of the Sikes Act (16 U.S.C. 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation.

Specific deadlines limit the time and information available for making designations

Section 4(a)(3) requires NOAA Fisheries to make critical habitat designations concurrently with the listing determination, to the maximum extent prudent and determinable:

> (3) The Secretary, by regulation promulgated in accordance with subsection (b) of this section and to the maximum extent prudent and determinable -
> (A) shall, concurrently with making a determination under paragraph (1) that a species is an endangered species or a threatened species, designate any habitat of such species which is then considered to be critical habitat

The time for designating critical habitat may be extended pursuant to section 4(b)(6)(C), but not by more than one additional year:

> (C) A final regulation designating critical habitat of an endangered species or a threatened species shall be published concurrently with the final regulation implementing the determination that such species is endangered or threatened, unless the Secretary deems that -
> (i) it is essential to the conservation of such species that the regulation implementing such determination be promptly published; or

(ii) critical habitat of such species is not then determinable, in which case the Secretary, with respect to the proposed regulation to designate such habitat, may extend the one-year period specified in subparagraph (A) by not more than one additional year, but not later than the close of such additional year the Secretary must publish a final regulation, based on such data as may be available at that time, designating, to the maximum extent prudent, such habitat.

Impacts of designation must be considered and areas may be excluded

Specific areas that fall within the definition of critical habitat are not automatically designated as critical habitat. Section 4(b)(2) (16 U.S.C. 1533(b)(1)(A)) requires the Secretary to first consider the impact of designation and permits the Secretary to exclude areas from designation under certain circumstance. Exclusion is not required for any areas.

> The Secretary shall designate critical habitat, and make revisions thereto, under subsection (a)(3) of this section on the basis of the best scientific data available and after taking into consideration the economic impact, the impact to national security and any other relevant impact, of specifying any particular area as critical habitat. The Secretary may exclude any area from critical habitat if he determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless he determines, based on the best scientific and commercial data available, that the failure to designate such area as critical habitat will result in the extinction of the species concerned.

Federal agencies must ensure their actions are not likely to destroy or adversely modify critical habitat

Once critical habitat is designated, section 7(a)(2) provides that federal agencies must ensure any actions they authorize, fund or carry out are not likely to result in the destruction or adverse modification of designated critical habitat (16 U.S.C. 1536(a)(2)). Section 7 also requires federal agencies to ensure such actions do not jeopardize the continued existence of the listed species:

> Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency (hereinafter in this section referred to as an "agency action") is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical, unless such agency has been granted an exemption for such action by the Committee pursuant to subsection (h) of this section. In fulfilling the requirements of this paragraph each agency shall use the best scientific and commercial data available.

Authority to designate critical habitat is delegated to NOAA Fisheries

The authority to designate critical habitat, including the authority to consider the impacts of designation, the authority to weigh those impacts against the benefit of designation, and the authority to exclude particular areas, has been delegated to the Assistant Administrator of the National Marine Fisheries Service. Department Organization Order 10-15 (5/24/04). NOAA Organization Handbook, Transmittal #34 (May 31, 1993).

Joint regulations govern designation

Joint regulations of the Services elaborate on those physical and biological features essential to conservation, and set criteria for the delineation of critical habitat.

> 50 CFR Sec. 424.12 Criteria for designating critical habitat.
>
> (b) In determining what areas are critical habitat, the Secretary shall consider those physical and biological features that are essential to the conservation of a given species and that may require special management considerations or protection. Such requirements include, but are not limited to the following:
> (1) Space for individual and population growth, and for normal behavior;
> (2) Food, water, air, light, minerals, or other nutritional or physiological requirements;
> (3) Cover or shelter;
> (4) Sites for breeding, reproduction, rearing of offspring, germination, or seed dispersal; and generally;
> (5) Habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.
>
> When considering the designation of critical habitat, the Secretary shall focus on the principal biological or physical constituent elements within the defined area that are essential to the conservation of the species. Known primary constituent elements shall be listed with the critical habitat description. Primary constituent elements may include, but are not limited to, the following: roost sites, nesting grounds, spawning sites, feeding sites, seasonal wetland or dryland, water quality or quantity, host species or plant pollinator, geological formation, vegetation type, tide, and specific soil types.
> (c) Each critical habitat will be defined by specific limits using reference points and lines as found on standard topographic maps of the area. Each area will be referenced to the State(s), county(ies), or other local governmental units within which all or part of the critical habitat is located. Unless otherwise indicated within the critical habitat descriptions, the names of the State(s) and county(ies) are provided for information only and do not constitute the boundaries of the area. Ephemeral reference points (e.g., trees, sand bars) shall not be used in defining critical habitat.
> (d) When several habitats, each satisfying the requirements for designation as critical habitat, are located in proximity to one another, an inclusive area may be designated as critical habitat.

The regulations confine designation to areas within United States jurisdiction:

h) Critical habitat shall not be designated within foreign countries or in other areas outside of United States jurisdiction.
Sec. 424.12

The regulations define "special management considerations or protection."

(j) Special management considerations or protection means any methods or procedures useful in protecting physical and biological features of the environment for the conservation of listed species.
Sec. 424.02

Approach to designation

Based on this statutory and regulatory direction, our approach to designation included the following steps:

1. Identify specific areas eligible for critical habitat designation
   - Identify areas meeting the definition of critical habitat
   - Identify military areas ineligible for designation

2. Conduct a Section 4(b)(2) analysis:
   - Determine the impacts of designation
   - Determine the benefits of designation
   - Determine the benefits of exclusion
   - Determine whether benefits of exclusion outweigh benefits of designation and recommend exclusions if appropriate
   - Determine whether the recommended exclusions will result in extinction of the species

II. Identify Specific Areas Eligible for Critical Habitat Designation

Identify areas meeting the definition of critical habitat

Areas that meet the definition of critical habitat include specific areas: 1) within the geographical area occupied by the species at the time of listing, if they contain physical or biological features essential to conservation, and those features may require special management considerations or protection; and 2) outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation. In a separate report, we have documented our conclusions regarding which specific areas meet the definition of critical habitat and may therefore be eligible for designation (NMFS 2006a). Pursuant to section 3(5)(A), our first task was to determine "the geographical area occupied by the species at the time of listing."

Geographical Area Occupied by the Species

There is considerable information on the range and movements of Southern Resident killer whales from late spring to early autumn (May-September), when all three Southern Resident pods, J, K and L, are regularly present in the Georgia Basin (defined as the Georgia Strait, San Juan Islands, and Strait of Juan de Fuca) (Heimlich- Boran 1988, Felleman et al. 1991, Olson 1998, Osborne 1999). The Georgia Basin is a large estuary complex, carved by glaciers, receiving runoff from the encircling Cascade and Olympic mountains, and connected to the Strait of Georgia and the western North Pacific Ocean through the Strait of Juan de Fuca. The Sound is surrounded by approximately 2,500 miles of shoreline, a mosaic of beaches, bluffs, bays, estuaries, mudflats and wetlands. More than 10,000 streams and rivers drain into Puget Sound.

All three pods typically arrive in May or June and spend most of their time in inland waters until departing in October or November. During early autumn, they expand their routine movements further south into Puget Sound. There are no confirmed sightings of Southern Resident killer whales inside Hood Canal. During the public comment period on the proposed rule to designate critical habitat, we received information regarding historical use of Hood Canal by Southern Residents including several confirmed sightings or recordings from the 50s and 70s and many more anecdotal sightings. These data were not sufficient to consider Hood Canal "occupied at the time of listing." We do not consider extremely shallow inland waters (less than 20 feet deep measured at extreme high tide) to be within the geographical area occupied by the species because these large animals are seldom observed in shallow waters (in contrast to other killer whale populations). During the public comment period we received additional information on use of shallow waters by Southern Residents. Several commenters provided accounts of Southern Residents moving through several specific shallow areas, particularly near one shore-based research station. These data were not sufficient to consider all areas shallower than 20 feet as occupied habitat.

During the late fall, winter, and early spring, the ranges and movements of the Southern Residents are less well known. Sightings of the whales passing through the Strait of Juan de Fuca in late fall suggest their activity shifts to coastal waters. There is very little information on the movements of Southern Resident killer whales off the coast. In the last 30 years of study, there are only 28 confirmed sightings in outside waters, although we expect ongoing research to significantly expand our knowledge in the next few years.

Although the Southern Residents' range includes inland waters of Canada, we are not designating these areas because our regulations provide that we will not designate critical habitat within foreign countries or in other areas outside of U.S. jurisdiction.

Physical or Biological Features Essential to Conservation

We determined the physical or biological habitat features essential to Southern Resident killer whale conservation based on their biology and life history, focusing on "primary constituent elements" as directed by our regulations. These include water quality, prey, and passage. We considered the biology and life history of Southern Residents, and regulatory direction, in identifying the physical or biological features essential to the

species conservation. We identified these three features, or primary constituent elements, in our notice of proposed listing, plus an additional feature of "sound levels" and asked for comment (69 FR 76673, December 22, 2004). We received very few comments. In the proposed rule we included the three features and requested further information on the additional feature of sound. While we received comments requesting inclusion of sound as a PCE, we do not have sufficient information to include sound and the final rule designating critical habitat includes the three PCEs of prey, water quality and passage.

Killer whales eat several species of fish, with salmon being the preferred prey, and Chinook salmon the preferred salmon species. These mammals consume large quantities of fish, with one estimate that the population as a whole consumes some 850,000 salmon per year (NMFS 2006a). The whales require sufficient prey to support individual growth to reach sexual maturity and reproduction, including lactation and successful rearing of calves. In addition to sufficient biomass of prey species, the prey must not have amounts of contaminants that exceed levels that can cause mortality or reproductive failure. Because of their long life span, position at the top of the food chain, and their blubber stores, killer whales accumulate high concentrations of contaminants. Many chemical compounds are a concern because they can suppress the immune system, impair reproduction, and cause other physiological damage.

To move between important habitat areas, find prey and fulfill other life history requirements, the Southern Residents require open waterways that are free from obstruction, such as vessels or in-water structures. Killer whale habitat use is dynamic and specific breeding, calving or resting areas have not been documented. The whales are highly mobile and can travel up to 100 miles in 24 hours, allowing rapid movements between areas. We therefore did not identify sites as essential features but instead focused on more basic habitat elements.

"Specific Areas" within the Occupied Geographical Area

Within the geographical area occupied by the species, we identified three specific areas in which the essential habitat features are found. These are illustrated in the map at Appendix A. We have previously acknowledged that "the delineation of . . . specific areas . . . should be as small as practicable, to ensure our designations are not unnecessarily broad and to carry out congressional intent that we fully consider the impacts of designation" (70 FR 52630 Sept. 2, 2005). The size and configuration of specific areas will depend upon the nature of the physical or biological features, the needs of the species, and the way the species uses its habitat.

Although the specific areas we are recommending are large, we consider them appropriate in light of the statutory and regulatory direction. The whales do not have fixed sites for breeding, feeding, or other behaviors, as contemplated by the regulations. There are features such as prey, however, that are contemplated by the regulations. These features are highly mobile and widely dispersed, moving freely about the geographical area occupied by the species. The Southern Residents likewise are highly mobile, traveling as far as a hundred miles in a day, likely in pursuit of prey. We could not discern smaller or more targeted "specific areas" that would be meaningful either in

terms of bounding the features or describing the species' use. For each of the three specific areas, we verified the presence of one or more of the features and that the features in that area "may require special management consideration or protection."

At this time we are not recommending specific areas in coastal waters for designation. Although the whales spend a significant amount of the year in coastal waters, we currently have very little information about their range and activities during this time of year. We have initiated research to gather this information and will pursue designation once there is adequate information.

Special Management Considerations or Protection

Agency regulations define "special management considerations or protection" to mean "any methods or procedures useful in protecting physical and biological features of the environment for the conservation of listed species." Several forms of human activity have the potential to affect the habitat features essential to killer whale conservation. Fishing, hatchery practices and habitat alteration are all human activities that may threaten the whales' prey. Human activity continues to pollute Puget Sound, threatening the contamination levels of the prey. Vessels may present obstacles to free passage by the whales. We verified that the essential physical or biological features in each specific area may require special management considerations or protection, as defined by our regulations.

Unoccupied Areas

ESA section 3(5)(A)(ii) further defines critical habitat to include "specific areas outside the geographical area occupied" if the areas are determined "essential for the conservation of the species." Our regulations specify that we will designate unoccupied areas "only when a designation limited to its present range would be inadequate to ensure the conservation of the species." At the present time we have not identified any areas outside the geographical area occupied by the species that are essential for its conservation and are not recommending designation of any unoccupied areas.

Military areas ineligible for designation

Recent amendments to the ESA preclude the Secretary from designating military lands as critical habitat if those lands are subject to an Integrated Natural Resource Management Plan (INRMP) under the Sikes Act and the Secretary certifies in writing that the plan benefits the listed species (Section 4(a)(3), Public Law. No. 108-136). We identified eight military installations in the Pacific Northwest with INRMPs in place. Based on our review of these plans and discussions with the Navy, we concluded the shore-based military areas covered by INRMPs overlap killer whale critical habitat very little or not at all, and thus the critical habitat areas are not "subject to" INRMPs. (While the INRMPs do not specifically address killer whale habitat management, we believe the INRMPs do provide a benefit to killer whales, for example by managing habitat to benefit salmon, which are prey for killer whales.) We therefore confined our consideration of these military areas to an analysis of the benefits of designation versus benefits of exclusion, described further below.

III. Conduct a Section 4(b)(2) Analysis

Section 4(b)(2) of the ESA requires us to use the best scientific information available in designating critical habitat. It also requires that before we may designate any "particular" area, we must consider the economic impact, impact on national security and any other relevant impact. Once impacts are determined, the agency is to weigh the benefits of excluding any particular area (that is, avoiding the economic, national security, or other costs) against the benefits of designating it (that is, the conservation benefits to the species). If the agency concludes that the benefits of exclusion outweigh the benefits of designation, it has discretion to exclude, so long as exclusion will not result in extinction of the species.

Identify "Particular" Areas

Section 3(5) defines critical habitat as "specific areas," while section 4(b)(2) requires the agency to consider certain factors before designating any "particular area." Depending on the biology of the species, the characteristics of its habitat, and the nature of the impacts of designation, "specific" areas might be different from, or the same as, "particular" areas. For this designation, we analyzed two types of "particular" areas. Where we considered economic impacts, and weighed the economic benefits of exclusion against the conservation benefits of designation, we used the same biologically-based "specific" areas we had identified under section 3(5)(A) (Areas 1, 2, and 3, shown on the Appendix A map). This delineation allowed us to most effectively consider the conservation value of the different areas when balancing conservation benefits of designation against economic benefits of exclusion. Where we considered impacts on national security, however, we instead used a delineation of "particular" areas based on ownership or control of the area. This delineation allowed us to compare and balance the benefits associated with land ownership and management.

Determine the Impacts of Designation

Section 4(b)(2) provides that the Secretary shall consider certain impacts before designating critical habitat: "the Secretary shall designate critical habitat . . . on the basis of the best scientific data available and after taking into consideration the economic impact, impact to national security, and any other relevant impact of specifying any particular area as critical habitat." The primary impact of a critical habitat designation comes from the section 7(a)(2) requirement that federal agencies ensure their actions are not likely to result in the destruction or adverse modification of critical habitat. Determining this impact is complicated by the fact that section 7(a)(2) contains the overlapping requirement that federal agencies must also ensure their actions are not likely to jeopardize the species' continued existence. The true impact of designation is the extent to which federal agencies change their actions – beyond any changes they would make because of listing and the jeopardy prohibition – to ensure their actions are not likely to adversely modify the critical habitat. Additional impacts of designation include state and local protections that may be triggered as a result of designation, and benefits that may arise from education of the public to the importance of an area for species conservation. We did not identify state or local protections that may be triggered by this

proposed designation, but have identified educational benefits. We discuss educational benefits in the section below on "Benefits of Designation."

In practice, we have found it difficult to predict the change in federal agency activities as a result of critical habitat designation and section 7 consultation on the adverse modification prohibition, in addition to the changes predicted to occur as a result of listing and the jeopardy prohibition. For example, in our recent critical habitat designations for salmon and steelhead, informed by a Tenth Circuit decision, we considered the "co-extensive" impact of designation – that is, the predicted change in agency action as a result of critical habitat designation and the adverse modification prohibition, even if the same change would have occurred because of listing and the jeopardy prohibition.

For the present rule-making, we again consider the co-extensive impact of designation. We have, however, considered additional court decisions and agency guidance in an effort to better inform our recommendations. Those decisions and that guidance suggest that the focus of the jeopardy analysis is on the effect of the federal agency action on the species itself, and individual members of the species. The adverse modification analysis, in contrast, focuses on the action's effect on the primary constituent elements of the species' habitat and the value of the habitat. As the Court of Appeals for the Fifth Circuit noted:

> [T]he destruction/adverse modification standard is defined in terms of actions that diminish the 'value of critical habitat' for survival and recovery. Such actions conceivably possess a more attenuated relationship to the survival and recovery of the species. The destruction/adverse modification standard focuses on the action's effects on critical habitat. In contrast, the jeopardy standard addresses the effect of the action itself on the survival and recovery of the species. The language of the ESA itself indicates two distinct standards.

Sierra Club v. U.S. Fish and Wildlife Service, 245 F.3d 434, 441-42 (5th Cir. 2001).

Recent guidance from the NOAA Assistant Administrator for Fisheries further clarifies the proper focus of an adverse modification analysis:

> In the "Effects of the Action" analysis, characterize the direct and indirect effects of the action . . . o[n] designated critical habitat. Describe how the primary constituent elements or habitat qualities essential to the conservation of the species are likely to be affected and, in turn, how that will influence the function and conservation role of the affected critical habitat unit(s) or specific areas.
> . . .
> In the "Conclusion" section . . . [d]iscuss whether, with the implementation of the proposed Federal action, critical habitat would remain functional (or retain the current ability for the primary constituent elements to be functionally established) to serve the intended conservation role for the species (NMFS 2005)

With this guidance in mind, we examined the types of federal activities that may affect Southern Resident killer whale critical habitat. Because killer whales are newly listed and we lack a consultation history, we necessarily had to make assumptions about what types of federal activities might undergo section 7 consultation. We identified three categories of activities that may affect killer whale critical habitat: salmon fishing, vessel traffic, and water quality management. We could not identify a federal nexus for a section 7 consultation on vessel traffic that would relate to the effects of vessels on killer whale passage. (The only vessels we identified with a section 7 nexus were U.S. vessels, such as military, Coast Guard, etc., and ferries, which receive federal funding. However, since these vessels do not affect the whales' ability to pass freely among areas, we do not anticipate section 7 consultations will have any habitat-related impacts on operations of these vessels.) We therefore examined the potential impact of section 7 consultations on salmon fishing and water quality management. For these activities, we considered the range of changes we might seek to avoid adverse modification of killer whale habitat, again making assumptions, given the lack of consultation history. We relied on information from our proposed conservation plan for the Southern Resident killer whales developed under the Marine Mammal Protection Act (70 FR 57565, October 3, 2005), comments on that plan, information from our listing determination (including comments on the proposed listing determination), and other information available to the agency to establish the types of activities and the potential range of changes meant to avoid adverse modification.

For salmon fishing, we considered it too speculative to predict any particular level of reduction, and so considered the total value of salmon fishing in Puget Sound. If any reduction in fishing were to be required as a result of critical habitat designation, it would be some portion of that total. For actions related to water quality management, we considered it too speculative to predict either the actions that might undergo ESA section 7 consultation or the types of changes we might seek.

Where possible, we assigned impacts to each particular area. For impacts to salmon fisheries, we did allocate impacts to particular areas but recognize that because of the migratory behavior of salmon (in contrast to fixed habitat features), designation of any area has the potential to affect harvest in other areas.

In considering potential impacts for each particular area, we kept in mind certain analytical limitations resulting in part from our lack of a consultation history: not all activity types are equally likely to incur changes as a result of section 7 consultation; all estimates are based on potential changes resulting from ESA section 7 consultation, regardless of whether the modifications are the result of the "jeopardy" or "adverse modification" prohibition of section 7; within each activity type, estimates are based on potential changes, so there is a wide range of estimated impacts; while some impacts are allocated to a particular area, they could result because of other areas being designated. Regarding the first two limitations, we have attempted in this analysis to weigh impacts of designation according to whether they are more or less likely to occur, and whether they are more closely associated with jeopardy or adverse modification, as described below.

Regarding the first limitation, we considered each of the activity types and how likely it was that a change in a proposed federal action would be required as a result of ESA section 7 consultation (NMFS 2006b, included as Appendix B). We considered some changes to be "likely" (it is foreseeable a change will occur in most cases); some changes to be "potential" (it is foreseeable a change will occur but we currently lack data to predict with any confidence the nature and extent of the change); or "unlikely" (it is foreseeable a change will not occur in most cases). In balancing the benefits of designation against the benefits of exclusion, we gave greater weight to changes we considered "likely" or "potential" than to changes we considered "unlikely."

Regarding the overlapping prohibitions of section 7, we analyzed each type of activity to determine whether it directly affects individual members of the species or affects them through a habitat modification (that is, does the activity bear a more direct relationship to the jeopardy or adverse modification prohibition of section 7). In balancing the benefits of designation against the benefits of exclusion, we gave greater weight to changes we considered as having a more direct relationship to adverse modification of critical habitat and less weight to changes we considered as having a more direct relationship to jeopardy. Table 1 summarizes the nature and likelihood of impact for each type of activity, and Table 2 depicts the relative weight we gave each impact as a result of these considerations.

Table 1: Nature and Likelihood of Impact Resulting from Section 7 Consultation, by Activity Type

Activity Type	Essential Feature Affected and Nature of Effect	Type of Impact	Likelihood of Impact
Fisheries	• Affects prey • Potential direct injury to whales • Seasonal habitat change in fixed location	Harvest reduction or change in timing, location, etc. by critical habitat area	Potential[1]
		Harvest closure by management area	Unlikely
Water Quality Management – Contaminants	• Affects prey • Persistent, continual habitat change in fixed location	Changes in water quality standards	Potential
Water Quality Management – Oil Spills	• Affects water quality • Potential direct injury to whales • Long-term habitat change w/o a fixed location	Changes in oil spill regulations	Unlikely

[1] Should it be necessary to reduce Puget Sound fisheries, a reduction in tribal fisheries would only occur consistent with the principles established in the Secretarial Order, "American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act." The Secretarial Order states in relevant part:

> In cases involving an activity that could raise the potential issue of an incidental take under the Act, such notice shall include an analysis and determination that all of the following conservation standards have been met: (i) the restriction is reasonable and necessary for conservation of the species at issue; (ii) the conservation purpose of the restriction cannot be achieved by reasonable regulation of non-Indian activities; (iii) the measure is the least restrictive alternative available to achieve the required conservation purpose; (iv) the restriction does not discriminate against Indian activities, either as stated or applied; and, (v) voluntary tribal measures are not adequate to achieve the necessary conservation purpose.

Table 2. Impact of Designation – Relative weights for each type of activity (greatest weight at top left of the matrix, least weight at bottom right)

Likelihood of change occurring as a result of section 7 consultation				
Relationship to Section 7 jeopardy versus adverse modification		**Likely** (highest weight)	**Potential**	**Unlikely**
	Adverse Modification (highest weight)		Water Quality Management	
	Both		Harvest Reduction or Change (overall, or change to timing or location)	Harvest closure by management area
	Jeopardy			Changes in oil spill regulations

Salmon Fishing. We considered changes to salmon harvest, either through harvest reductions or changes in timing or location of fishing effort to be "potential." The limited available information about killer whale foraging indicates salmon are their primary prey species (NMFS 2006a). We are therefore likely to focus section 7 consultations on actions affecting salmon abundance, particularly in times and areas where the whales are foraging. There is presently little direct information, however, about the interactions between salmon harvest and foraging success of whales. Because we presently lack information allowing us to predict the nature and extent of any changes we might seek, we consider reductions in salmon harvest or changes in the location and timing of harvest as "potential" impacts of section 7 consultation. In contrast, we considered harvest closure by management area "unlikely" because the management areas are large, not necessarily aligned with whale foraging areas, would likely involve species that may not be important components of the Southern Residents diet, and could include large numbers of fish that surpass the nutritional requirements of the whales for some catch areas.

We considered fishing to have an equally strong connection to both the jeopardy and the adverse modification prohibitions of section 7. Salmon fishing directly affects individual members of the species, by reducing the amount of food available and therefore potentially affecting the ability of individual animals to meet their nutritional

requirements. Salmon are also one of the biological features in the habitat essential to conservation of the whales, so fishing also modifies critical habitat by removing prey.

Because changes in fisheries through catch reductions or changes in timing and location are potential, and because they have a connection to both the jeopardy and adverse modification prohibition of section 7, we gave these potential changes a moderate weight (see Table 2). We gave area management closures a low weight because, while they have a connection to both the jeopardy and adverse modification prohibitions, they are unlikely.

We recognize that harvest is not the only activity affecting the prey PCE in the whales' habitat. A variety of section 7 consultations have been or are currently being conducted to address potential impacts to listed salmon and designated critical habitat for salmon in Puge Sound. Although we cannot attribute the cost of habitat restoration efforts or other salmon recovery efforts to the designation of critical habitat for Southern Resident killer whales, we recognize there are many activities aimed at restoring salmon that have costs associated with them. For example the Shared Strategy recently developed a draft recovery plan for listed Chinook in Puget Sound, which included estimated costs of $120 million per year to achieve the goals of the plan.

Water Quality Management. We considered changes in water quality standards to be "potential." Presently we lack sufficient information about the relationships among the sources of contaminants, their movement through the food chain, and their impact on killer whales to determine what changes we might seek. Once we have more information, however, we anticipate some changes may be required. Our ability to estimate impacts of designation is also complicated by the fact that the State of Washington has many efforts already underway to address water quality issues (PSAT 2005) and recently announced a new Puget Sound Partnership initiative to restore and protect Puget Sound. These efforts would presumably be in addition to existing requirements under the Clean Water Act and other applicable standards. Any new requirements imposed or efforts undertaken by the state and local governments would alter the baseline conditions, which we use to determine the impacts of designation.

We considered changes to oil spill regulations unlikely because we believe additional oil spill regulations are not needed to meet section 7 requirements.

Water quality management has the potential to affect individual Southern Residents, but is of greatest concern because it may allow contaminants to enter the whales' habitat and food chain. When ultimately consumed by killer whales the contaminants can cause injury, but the effect is through the whales' prey, an important feature of their habitat. Once the contaminants enter the habitat, they cause a long-lasting modification of the habitat. This modification occurs regardless of whether the whales are present at the time of the activity. We therefore consider this the activity with the strongest link to the adverse modification prohibition of section 7. Oil spills have the potential to modify habitat, but are a primary concern because of their potential to directly injure individual

animals. We considered this activity to have a stronger link to the jeopardy prohibition of section 7.

Because changes to water quality standards are potential, and have a strong connection to the adverse modification prohibition of section 7, we gave these changes a moderate to high weight. We gave changes to oil spill regulations a low weight because we consider such changes an unlikely result of section 7 consultation and because such changes would be more closely linked to jeopardy than to adverse modification.

As with ongoing efforts affecting the prey PCE, there are several major initiatives underway that affect the water quality in Puget Sound. Although we cannot attribute these costs to the designation of critical habitat for Southern Resident killer whales, we recognize that there are significant economic costs associated with these activities. For example the new Puget Sound Partnership through the Governor's office has recently estimated that $570 million of the state biennium funds are spent on Puget Sound conservation, restoration, species recovery, and pollution reduction. The 2005-2007 Puget Sound Action Team plan included $182 million to achieve their goals to improve conditions in Puget Sound.

We did not identify other relevant impacts of designation beyond conservation, economic, and national security impacts. Table 1 identifies the factors we considered in determining the impacts of designation. These factors also entered into our recommended weighing of the benefits of designation versus benefits of exclusion, displayed in Table 2. "Likely," "potential," and "unlikely" impacts are further described in NMFS 2006b (included as Appendix B).

Determine the benefits of designating each particular area

The primary benefit of designation is that section 7 of the ESA requires all federal agencies to ensure their actions are not likely to destroy or adversely modify the designated habitat. This is in addition to the requirement that all federal agencies ensure their actions are not likely to jeopardize the species' continued existence. Another benefit of designation is that it provides notice of areas and features important to species conservation, and information about the types of activities that may reduce the conservation value of the habitat. Critical habitat designation may also trigger protection under state or local regulations.

In addition to the direct benefits of critical habitat designation to the killer whales, there may be ancillary benefits. These other benefits may be economic in nature, or they may be expressed through beneficial changes in the ecological functioning of Puget Sound. For example, Puget Sound supports an active whale watching industry, and so an increase in the killer whale population could increase the economic value of that activity. Another example could be the increased viability of Puget Sound salmon populations if the killer whale designation increases protections for salmon. Yet another example could be reduced levels of pollution in Puget Sound.

With sufficient information, it may be possible to monetize benefits of critical habitat designation. For the direct benefits, this would require us to first quantify the benefit to killer whales expected from section 7 consultation (for example, the number of killer whales saved or the increase in their longevity, health, productivity, etc.), and then translate that benefit into dollars (for example, using information about willingness-to-pay). For the ancillary benefits, monetizing benefits would require quantifying the effects of critical habitat protection to these other possible sources of benefits, and then translating these impacts into dollars.

We are not aware of any available data that would support either step of such an analysis for killer whales. The short statutory timeframes and the statute's requirement to use best "available" information suggest such a costly and time-consuming approach is not currently possible. In addition, ESA section 4(b)(2) requires us to consider and weigh impacts other than economic impacts that are equally difficult to monetize, such as the benefits to national security of excluding areas from critical habitat. Given the lack of information that would allow us either to quantify or monetize the benefits of designation for the whales, we have determined the qualitative conservation benefits of designating each of the three particular areas identified as critical habitat.

In determining the benefit of designation for each area, we considered a number of factors. We took into account the physical and biological features (or primary constituent elements – PCEs) present in the area, the types of human activities occurring in the area that may threaten the features, and the likelihood that designation would lead to changes in those activities either because of a section 7 consultation or because of the educational effect of designation. We also considered that each area is unique and supports a distinct aspect of the whales' life history. Area 1, is the core summer feeding area for the whales, while Area 2 is important for fall feeding and Area 3 is important for passage to and from coastal waters to the interior waters of Puget Sound. The conservation function of each area complements the conservation function of the others, and therefore, designation of each particular area benefits the conservation function of the other areas.

We recognized that although these are free-swimming marine mammals, their habitat in Puget Sound is irreplaceable. Southern Resident killer whales exhibit a site fidelity to Puget Sound that is learned. If their habitat in Puget Sound becomes unsuitable, it is unlikely they would seek new areas for summer and fall foraging, and unlikely they would find another geographical area like the Sound that concentrates their preferred prey in an enclosed environment that enhances prey detection and capture.

We also considered that the unique physical attributes of these inland marine waters make them susceptible to degradation – Puget Sound's long and narrow configuration, with a shallow sill at the north end, limits the extent to which the area is flushed with ocean water. The history of development in and around these waters has caused considerable degradation of the habitat. It was the threats from this degradation, in part, that led us to list the whales as endangered.

Area 1. This is the particular area where Southern Residents are most frequently observed and likely the most important area for their conservation. Whales are observed feeding, socializing, traveling and resting in Area 1. The Strait of Juan de Fuca, Haro and Georgia Straits are relatively narrow channels and concentrate salmon returning from the Pacific Ocean to spawn in U.S. and Canadian rivers. In particular, Area 1 lies near the mouth of the Fraser River, which has the largest salmon runs in the Georgia Basin/Puget Sound region (Northcote and Atagi 1997). Runs of salmon passing through the area include Chinook, chum, coho, pink, and sockeye salmon, which have all been identified as prey for Southern Residents (Ford et al 1998, Ford and Ellis 2005, NWFSC unpubl. data).

Killer whales require abundant prey for successful foraging. Designation of Area 1 as critical habitat is likely to improve the ability of an ESA section 7 consultation to focus on salmon abundance as an essential biological feature of the whales' habitat. It is also likely to improve the ability of a section 7 consultation to affect water quality management activities, though we have little information at this time to predict how such actions may be changed as a result of section 7 consultation.

There is little likelihood that a section 7 consultation would affect vessel traffic in Area 1, but we believe critical habitat designation may provide significant conservation benefits to killer whales in this area because of its educational value for boaters. Since designation of the Southern Residents as a depleted stock under the Marine Mammal Protection Act, we have increased our efforts to work with Department of Fisheries and Oceans Canada, Washington State, monitoring groups, industry, and a wide variety of other partners on a major campaign to educate boaters. The "Be Whale Wise" campaign is aimed at all boaters operating in the vicinity of whales and establishes responsible viewing practices to avoid harassing the whales. Be Whale Wise is used in on-water stewardship and enforcement activities, as well as in broader educational programs including billboards, aquarium and museum exhibits, classroom programs and presentations to community groups. In addition to the "Be Whale Wise" campaign, there is a voluntary "no vessel" area off Lime Kilm Point State Park on the west coast of San Juan Island, which is within Area 1 and is an important resting and foraging area for the whales. Members of the Whale Watch Operators Association Northwest respect this voluntary "no vessel" area, but many other vessel operators do not.

We believe the "Be Whale Wise" campaign and the voluntary "no vessel" area are crucial components of a successful conservation effort for killer whales, particularly because of the lack of a section 7 nexus to vessel operations. If we can highlight that the area is "critical habitat" for the whales, it will strengthen the message to boaters about the importance of vessel behavior in the area. In addition, it enables us to encourage certain behavior (such as staying out of an area, or traveling at certain speeds in an area) even if boaters can't actually see the whales. Designation will thus strengthen these important outreach and education efforts. While we did not assign a weight of designation impacts to vessel operations because of the lack of a section 7 nexus (Tables 1 and 2), we did, however, consider the likelihood of educational benefits in weighing the benefits of designation for each area (Tables 3, 4 and 5).

Table 3 illustrates the various factors we considered in weighing the benefit of designation for Area 1, in addition to the overall considerations described above.

Table 3. Benefit of Designation for Area 1

PCEs	Threats	Frequency/ Importance of threats	Weight of designation impacts based on Table 2	Likelihood of education benefits
Water quality	Oil spills	High	Low	
Prey	Water quality	Moderate	Mod-High	
	Fishing	High	Moderate	
Passage	Physical presence of vessels (all types)	High		High

Area 2. Southern Resident killer whales have been seen in parts of Area 2 in all seasons, but utilize Area 2 more in the fall than in the summer. They likely move into this area to take advantage of chum and Chinook runs, as their occurrence in the area has been correlated with fall runs of these salmon. Feeding has been observed in Area 2 (Mark Sears pers. comm., NWFSC unpubl. data) although few behavioral studies have been conducted in this area. The J pod in particular expands into this area in the fall (Osborne 1999), and a fall chum run has been suggested as the likely reason for an extended presence of members of L pod in Dyes Inlet during October and November of 1997.

Area 2 may be less important than Area 1 to killer whale conservation. There are fewer sightings of whales in this area, particularly south of the Tacoma Narrows bridge, and salmon stocks are not as abundant as in Area 1. Nevertheless, late salmon runs appear to provide needed prey during the fall, particularly for J pod. As with designation of Area 1, designation of Area 2 as critical habitat is likely to improve the ability of an ESA section 7 consultation to focus on salmon abundance as a habitat feature. It may also improve the ability of a section 7 consultation to affect water quality management activities. Though we have little information at this time to predict what those actions may be and how they may be changed as a result of section 7 consultation, it is clear that water quality in Area 2 is the most impaired of all three areas.

There is little likelihood that a section 7 consultation would affect vessel traffic in Area 2, but we believe critical habitat designation may provide some conservation benefits to

killer whales in this area because of its educational value for boaters. Interference with the whales from vessels is not as great a concern in Area 2 as in Area 1, but it is still an important concern because of the large number of recreational vessels in this area and the potential for disturbance.

Table 4 illustrates the various factors we considered in weighing the benefit of designation for Area 2, in addition to the overall considerations described above.

Table 4: Benefit of designation for Area 2

PCEs	Threats	Frequency/ Importance of threats	Weight of designation impacts based on Table 2	Likelihood of education benefits
Water quality	Oil spills	High	Low	
Prey	Water quality	High	Mod.-High	
	Fishing	High	Moderate	
Passage	Physical presence of vessels (all types)	Moderate		Moderate

Area 3. Area 3 provides needed passage for Southern Residents from the interior waters of Puget Sound to coastal waters. Although the whales may also feed as they transit this area, the most important physical habitat feature of this area is passage. Sightings of the Southern Residents in Area 3 are limited, particularly on the U.S. side of the international boundary as there is little observation effort in the area, particularly to the west toward the Bonilla Point/Tatoosh line. Even with a small number of actual sightings we can infer that the whales are using this corridor and that passage is an essential feature of Area 3 based on the inland and coastal sightings of whales. The Strait of Juan de Fuca is not the only transit corridor between inland waters and coastal British Columbia; the whales occasionally use the Strait of Georgia and Johnstone Strait in Canadian waters as an alternate route.

It is difficult to compare the importance of this area to Areas 1 and 2 because the whales use the areas for different activities. Designation of Area 3 as critical habitat may provide less benefit than designation of Areas 1 or 2. It may improve the ability of a section 7 consultation to affect water quality management activities, though we have little information at this time to predict what those actions may be and how they may be changed as a result of section 7 consultation. Water quality in Area 3 is the least impaired of all three areas.

Table 5 illustrates the various factors we considered in weighing the benefit of designation for Area 3, in addition to the overall considerations described above.

Table 5: Benefit of Designation for Area 3

PCEs	Threats	Frequency/ Importance of threats	Weight of designation impacts based on Table 2	Likelihood of education benefits
Water quality	Oil spills	High	Low	
Prey	Water quality	Moderate	Mod.-High	
	Fishing	Moderate	Moderate	
Passage	Physical presence of vessels (all types)	Low		Low

Determine the benefits of excluding each particular area

Section 4(b)(2) calls for balancing the benefits of designation against the economic, national security, and other benefits of exclusion. We recognize that, in reality, excluding an area from designation will not likely avoid all of the impacts we considered, because the section 7 requirement regarding jeopardy still applies, just as designating an area provides protection that overlaps with that afforded by the section 7 jeopardy prohibition. We considered the previously-discussed federal activities that could be changed as a result of a section 7 consultation and application of the adverse modification prohibition. We considered changes to those actions that could potentially be required to avoid adversely modifying critical habitat, regardless of whether the changes could also potentially be required to avoid jeopardizing the whales' continued existence. We first considered the national security benefits of excluding the 18 "particular" areas we had delineated based on military ownership or control. We next estimated the economic benefits of excluding each of the three "particular" areas we had delineated based on the Southern Residents' biology and habitat use.

National security benefits of exclusion

Prior to listing Southern Resident killer whales under the ESA, we contacted the DOD by letter and identified the location of 18 military sites, previously considered during salmon and steelhead habitat designations (70 FR 52630; September 2, 2005), that potentially overlapped with areas under consideration for Southern Resident critical habitat: (1) Naval Undersea Warfare Center, Keyport and associated range; (2) Naval Ordnance Center, Port Hadlock (Indian Island); (3) Naval Fuel Depot, Manchester; (4) Naval Air Station, Whidbey Island; (5) Naval Station, Everett; (6) Naval Hospital Bremerton; (7) Puget Sound Naval Ship Yard; (8) Strait of Juan de Fuca naval air-to-surface weapon range, restricted area; (9) Strait of Juan de Fuca and Whidbey Island naval restricted

areas; (10) Admiralty Inlet naval restricted area; (11) Port Gardner Naval Base restricted area; (12) Port Orchard Passage naval restricted area; (13) Sinclair Inlet naval restricted area; (14) Carr Inlet naval restricted area; (15) Port Townsend/Indian Island/Walan Point naval restricted area; (16) Crescent Harbor Explosive Ordnance Units Training Area; (17) Fort Lewis (Army); and (18) Pier 23 (Army.)

Several of the affected Department of Defense sites include nearshore and marine areas adjacent to or overlapping with geographic areas occupied by Southern Resident killer whales. Because of mapping imprecision, we cannot determine the extent to which the shore-based facilities may extend into 20-foot deep waters of Puget Sound and therefore the exact amount of overlap with proposed killer whale critical habitat. There are however, sites that clearly include waters deeper than 20 feet. The 18 sites including the nearshore and marine areas associated with these sites, cover approximately 112 square miles (291 square km) out of the total 2,676 square miles (6,931 square km) of area under consideration as critical habitat for Southern Residents. The shore-based sites cover 81 miles (130 km) of shoreline out the total 2,081 miles (3,349 km) of shoreline in the proposed critical habitat areas.

The Department of Defense confirmed that they own or control the 18 sites, identified the types of military activities that take place in the areas, and provided an assessment as to whether and how designation of critical habitat would affect military readiness. The Army and Navy concluded that critical habitat designation at any of these sites would likely impact national security by diminishing military readiness. The possible impacts include: preventing, restricting, or delaying training or testing exercises or access to sites; restricting or delaying activities associated with vessel/facility maintenance and ordinance loading; and delaying response times for ship deployments and overall operations.

Economic benefits of exclusion

An economic report describes in detail the actions we assumed may be affected, the potential range of changes we might seek in those actions, and the estimate of economic impacts that might result from such changes. We did not consider specific potential changes to fishing in Puget Sound, but instead identified the total value of salmon fishing in Puget Sound. This represents the extreme (and unlikely) high cost if all salmon fishing in Puget Sound were eliminated, with zero cost as the other end of the spectrum. We considered it too speculative at this time to postulate likely consultations on water quality management actions, and what changes we might seek in those actions. Although the only quantified costs were for potential changes to salmon harvest, this does not reflect the significance of any type of activity over another. The results of our analysis are contained in an economic report (NMFS 2006c) and are summarized below. Although the range of potential impacts is large, we consider it unlikely that the extreme ends of the range will be achieved.

Tables 6 through 8 illustrate the potential range of economic benefits of exclusion for each area, both by activity category and by total for the area. For activity categories

where there were two mutually exclusive options, we selected the more likely option. Thus, for salmon fishing, the more likely option is harvest reduction or changes in area and timing, rather than closure of management areas. The tables also display the weight we gave each activity, which is relevant to our consideration of costs for each area. As described in the draft economics report (NMFS 2006c) the total range of estimated economic impacts for this proposed designation is $0 – 20,143,000.

Table 6: Economic Benefit of Exclusion for Area 1 (in $1,000s)

Activity Type	Type of Impact	Weight	Range
Salmon Fishing	Harvest Reduction or Change (overall, or change to timing or location)	M	0-6,110
Water Quality Management	Water Quality Standards	M-H	NA
	Oil spills	L	0
Total			0-6,110

Table 7: Economic Benefit of Exclusion for Area 2 (in $1,000s)

Activity Type	Type of Impact	Weight	Range
Salmon Fishing	Harvest Reduction or Change (overall, or change to timing or location)	M	0-9,319
Water Quality Management	Water Quality Standards	M-H	NA
	Oil spills	L	0
Total			0-9,319

Table 8: Economic Benefit of Exclusion for Area 3 (in $1,000s)

Activity Type	Type of Impact	Weight	Range
Salmon Fishing	Harvest Reduction or Change (overall, or change to timing or location)	M	0-4,714
Water Quality Management	Water Quality Standards	M-H	NA
	Oil spills	L	0
Total			0-4,714

Balance the benefits of designation against the benefits of exclusion

The balancing test in section 4(b)(2) contemplates weighing benefits that are not directly comparable – the benefit associated with species conservation balanced against the economic benefit, benefit to national security, or other relevant benefit that results if an area is excluded from designation. Section 4(b)(2) does not specify a method for the weighing process, nor do our regulations. Legislative history suggests that the consideration and weight given to impacts is within the Secretary's discretion (H.R. 95-1625), and section 4(b)(2) makes clear that the decision to exclude is itself discretionary even when benefits of exclusion outweigh benefits of designation. The following sections describe the approach we took to balancing each of these different interests.

Balancing benefits of designation against national security benefits of exclusion

Our balancing of the benefits of designation against the benefits of exclusion for military areas is described more fully in a separate document (NMFS 2006d), reproduced at Appendix C. There are 18 military sites that overlap with areas we found to meet the definition of critical habitat for the Southern Resident killer whale DPS. These sites include shore-based areas (eight of which are covered by INRMPs), nearshore areas, and offshore areas in Puget Sound where the Navy has security restrictions. Notwithstanding our proposal that some of these sites are ineligible for designation, the Department of Defense asked us to consider conducting a section 4(b)(2) analysis to determine whether all of the sites could also be excluded from designation because the benefits of exclusion outweigh the benefits of designation.

The benefit of excluding these particular areas is that the Department of Defense would only be required to comply with the jeopardy prohibition of section 7(a)(2) and not the

adverse modification prohibition. The Department of Defense maintains that the additional commitment of resources in completing an adverse modification analysis, and any change in its activities to avoid adverse modification of critical habitat, would likely reduce its readiness capability. Given that the Department of Defense is currently actively engaged in training, maintaining, and deploying forces in the current war effort, this reduction in readiness could reduce the ability of the military to ensure national security.

We assessed the benefit of designating these areas of overlap based on: the physical or biological features of each area, the Southern Residents' use of each area (including how frequently they are present), the federal activities in each area that might trigger a section 7 consultation, the likelihood that we would seek a change in those activities, and the strength of the connection between those activities and habitat modification. The benefit of designation is that the section 7 requirement regarding adverse modification would focus our section 7 consultations on essential physical and biological features of the whales' habitat, particularly where the federal activity has a more direct impact on habitat features and a less direct impact on individual killer whales.

We considered the overlap of killer whale habitat within the boundaries of military sites; the conservation value of that habitat; and type of federal activities in those areas that would likely undergo section 7 consultation. We also considered the degree to which the military agencies believe designation will affect military readiness (NMFS 2006d and included as Appendix C). Based on our consideration, and given the following factors, we concluded that the national security benefits of exclusion outweigh the conservation benefits of designation for each of the 18 sites:

- the high priority placed on national security;
- the potential for critical habitat designation to have some impact on the Navy's military readiness;
- the existence of shore-based INRMPs that do provide some benefit to the whales; and
- the fact that collectively these areas represent relatively small percentages of the total habitat available for the whales and none of them occur in Area 1, the core summer area.

Balancing benefits of designation against economic benefits of exclusion

Section 4(b)(2) requires that we balance the benefit of designation against the economic benefit of exclusion for each particular area.

The benefit to the species of designation depends upon the inherent conservation value of the area, the seriousness of the threats to that conservation value, and the extent to which a section 7 consultation or the educational aspects of designation will address those threats. If a threat bears a closer relationship to the adverse modification prohibition of section 7, we can begin to understand and give weight to the incremental benefit of designation beyond the protection provided by listing and the jeopardy prohibition. We have identified the threats that face each area, and the likelihood that the adverse

modification prohibition will enhance our ability to address those threats. For example, because adverse modification and jeopardy bear an equally strong relationship to fishing, and because some changes in fishing are likely as a result of consultation, the benefits of designation relative to this particular activity will likely be moderate. Because adverse modification bears the strongest relationship to water quality management, but we cannot currently predict what changes are likely as a result of consultation, the benefits of designation relative to this particular activity will likely be moderate to high.

We listed the whales as endangered, citing, among other reasons "the ongoing and potentially changing nature of pervasive threats, in particular, disturbance from vessels, the persistence of legacy toxins and the addition of new ones into the whales' environment, and the potential limits on prey availability (primarily salmon) given uncertain future ocean conditions." As described above, designation of critical habitat will enhance our ability to address some of these threats, either through a section 7 consultation or through ongoing public outreach and education. Because some of these threats bear a stronger relationship to adverse modification than to jeopardy, we also believe there is an incremental benefit of designation beyond the protection afforded by the jeopardy prohibition.

The benefit of designation also depends on the inherent conservation value of the area. As discussed previously in the section on Benefits of Designation, the habitat areas for these killer whales are unique and irreplaceable. It is difficult to separate the value of any one of the areas: each of the three areas supports a distinct aspect of the whales' life history, and the conservation function of each area complements the conservation function of the others. Therefore designation of each particular area benefits the conservation function of the other areas. For all of the reasons discussed above, we consider the benefit of designation of each area to be high.

The benefit of exclusion of an area depends on some of the same factors – the likelihood of a section 7 consultation and the extent to which an activity is likely to change as a result of that consultation. As with the benefit of designation side of the equation, if a threat bears a closer relationship to the adverse modification prohibition of section 7, we can begin to understand and give weight to the incremental cost of designation (benefit of exclusion) beyond the cost associated with listing and the jeopardy prohibition. In balancing the potential costs of designation, we also considered the nature of the threats and the relevance of section 7's adverse modification prohibition to each threat. Because adverse modification and jeopardy bear an equally strong relationship to fishing, and because some changes in fishing are likely as a result of consultation, we gave these costs of designation moderate weight. We recognize that adverse modification bears the strongest relationship to water quality management, but we presently lack sufficient data to estimate an economic impact. We also recognize that we have not monetized (quantified) the costs that may be associated with the education benefit of designation.

We conclude that the economic benefits of excluding each particular area do not outweigh the conservation benefits of designating each particular area as critical habitat, given the endangered status of the whales, the uniqueness of the habitat, the fact that

threats to habitat were a primary concern leading to our endangered finding, and the fact that designation will enhance the ability of a section 7 consultation to protect the habitat.

Determine whether exclusion of particular areas will result in extinction

Section 4(b)(2) does not allow the agency to exclude areas if exclusion will result in extinction of the species. We are recommending exclusion of only a small percentage of the whales' habitat because of impacts to national security. Given this small percentage, we conclude that the exclusion of these areas will not result in extinction of the Southern Resident killer whale distinct population segment.

REFERENCES

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National Marine Fisheries Service (NMFS). 2006c. Economic Impacts Associated with Critical Habitat Designation for the Southern Resident Population of Killer Whales. Final Report prepared by Industrial Economics, Incorporated. November 7, 2006.

National Marine Fisheries Service (NMFS). 2006d. Memorandum to PRD File from Donna Darm, subject "Designating Critical Habitat for Southern Resident Killer Whales- Consideration for Department of Defense Owned and Controlled Areas and Impacts on National Security." October 6, 2006.

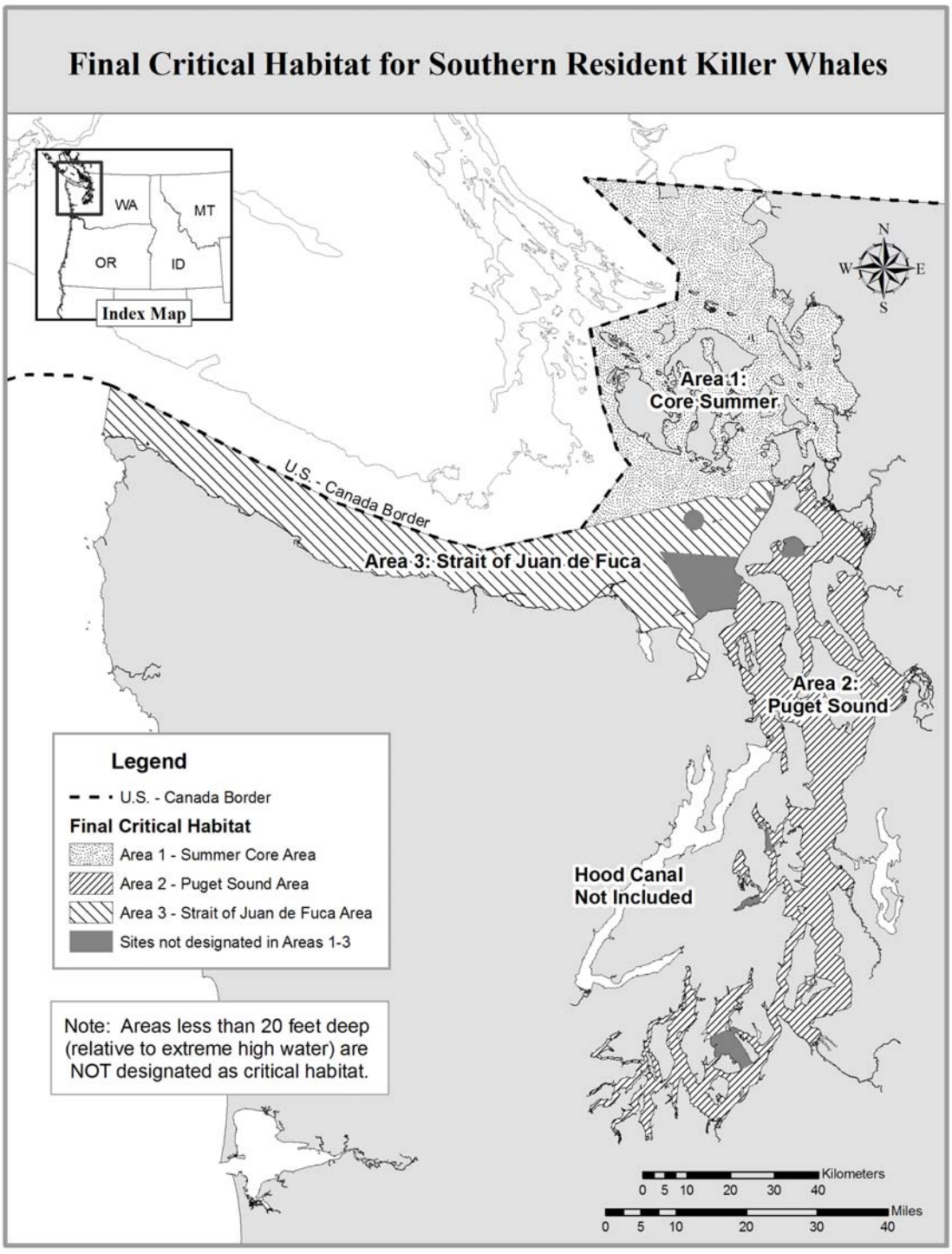
Puget Sound Action Team (PSAT). 2005. Puget Sound Conservation and Recovery Plan. Puget Sound Action Team, Olympia, WA. August 2005.

APPENDIX A: Map

APPENDIX B: Likelihood Memo

APPENDIX C: National Security Memo

Appendix A – Map Showing Designated Critical Habitat



Appendix B

October 5, 2006

MEMO

TO: Donna Darm, Assistant Regional Administrator, Protected Resources
Northwest Regional Office
NOAA Fisheries

FROM: Mark Plummer, Ph.D.
Northwest Fisheries Science Center
NOAA Fisheries

SUBJECT: **Evaluating the likelihood and nature of economic impacts for critical habitat designation for the Southern Resident Killer Whales (SRKW)**

The economic analysis of critical habitat designation for Southern Resident Killer Whales (SRKW) describes potential ranges of impacts but does not assign particular probabilities to possible impact levels. To address this issue, I met with Lynne Barre and Brent Norberg. We first developed methods for evaluating 1) the likelihood that an impact described in the economic report would actually occur in the foreseeable future and 2) whether the particular actions impacted by critical habitat designation operated as direct harm to the animals or indirectly through habitat modification. We then evaluated each impact described in the economic report in these two regards.

Methods for evaluating the likelihood and nature of critical habitat economic impacts

In considering the likelihood of an impact actually occurring, we decided an important consideration was the current status of data potentially useful for implementing section 7 of the ESA. In some instances, data exist to support a clear prediction about how section 7 is likely to be implemented. In such cases, we agreed that changes to projects could be categorized as either *likely* (*i.e.*, foreseeable that an impact will occur in most circumstances) or *unlikely* (foreseeable that an impact will not occur in most cases). If data do not currently exist to support a clear prediction, Lynne and Brent agreed that there are cases for which there are *potential* impacts once additional data are gathered.[1] We therefore considered a third category, which covered areas in which some impact was *likely to occur once additional data are gathered* but for which it was not yet possible to specify the likely extent or exact nature of the impact. We label this type of impact as "*potential.*"

In evaluating the nature of the economic impacts, we broadly considered two types of actions that would trigger section 7 and likely lead to economic impacts. The first was an action that directly injures a killer whale without an intervening effect on its habitat (*e.g.*, ship strikes, and gear entanglements) and would be more directly connected to the jeopardy prohibition of section 7. The second type was an action that harms killer whales through modification of their habitat and would be more directly connected to the adverse

[1] A final possibility is a case for which impacts are unlikely even if additional data are gathered. Such a case is categorized as *unlikely*.

modification of critical habitat provision. We further described habitat modifications by duration (continual or long-term) and whether the location of the modification was fixed.

Evaluation of likelihood and nature of economic impacts

After determining the methods described above, we then considered each type of impact covered in the economic analysis. Table 1 summarizes the results of the evaluation. Additional information on evaluation of likelihood and nature of impacts is included in the ESA 4(b)(2) analysis for designation of critical habitat for Southern Resident killer whales. In addition, Lynne Barre has provided data on killer whale sightings within the three areas being considered for critical habitat designation. While it is possible to summarize these data as percentages of all sightings within a particular area, it is not possible to infer the corresponding probability that impacts will occur within that area. Nevertheless, these data provide some additional guidance of the likely magnitudes of these probabilities. The data are summarized in Table 2, and are also illustrated in Figure 1.

Appendix B

Table 1

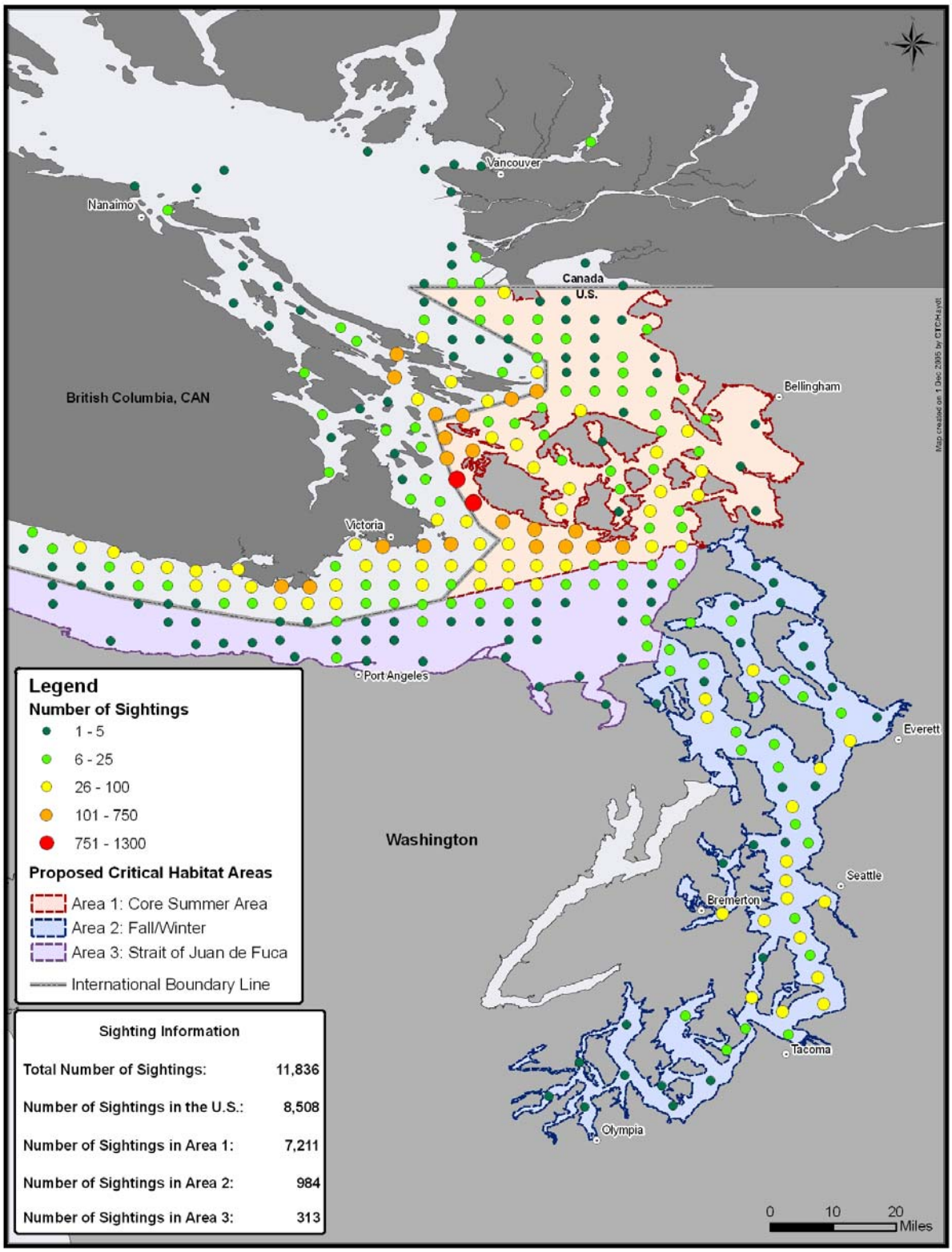
Economic Activity	Nature of Activity Effect on Killer Whales	Types of Economic Impacts Considered	Likelihood of Impact from Section 7 Implementation	Comments
Fisheries	Potential for injury to individuals and continual habitat change in fixed location (*i.e.*, reduction in prey abundance in Puget Sound and elsewhere)	Harvest reductions or changes in timing, location, etc., by critical habitat area	Potential	Assumes salmon recovery planning and implementation occur as currently envisioned
		Harvest closures by management area	Unlikely	
Water Quality Management-Contaminants	Continual habitat change in fixed location (*i.e.*, ambient water quality or contamination of prey species in Puget Sound)	Changes in water quality standards	Potential	Uncertainty regarding impacts from section 7 implementation
Water Quality Management-Oil Spills	Primarily direct injury to whales and potential for some long-term habitat change	Changes in oil spill regulations	Unlikely	

Appendix B

Table 2		
Critical Habitat Area	**Percentage of U.S. sightings in area***	**Discussion**
Area 1	84.8%	Southern Resident killer whales have been sighted in Area 1 during every month of the year, but sightings are more consistent and concentrated in the summer months, June through August. It is important to recognize that there is extensive sighting effort in Area 1 during the summer months when compared to other areas; however, the strength of the summer use pattern would undoubtedly persist if sighting effort were accounted for. Sighting data from 1976-1990, when effort was significantly lower also reflects this pattern (Whale Museum data). The largest numbers of sightings in Washington's inland waters are from Haro Strait off the west side of San Juan Island. There are over 1,200 unique sightings from 1990-2003 in one of the quadrants (west side of San Juan Island).
Area 2	11.6%	Southern Resident killer whales have been seen in parts of Area 2 in all seasons. The presence of Southern Residents in Area 2 is intermittent, with the smallest number of sightings in May-July. There are different sighting patterns in Area 2 for the three pods. During September, Southern Residents, especially J pod, expand their movements into Puget Sound to likely take advantage of chum and chinook salmon runs (Osborne 1999). In the most southern portion of Area 2, south of Tacoma Narrows Bridge, Southern Residents have been observed in October-January, with one additional sighting in April.
Area 3	3.6%	All pods regularly use the Strait of Juan de Fuca to transit from Areas 1 and 2 to outside waters. In addition, the Strait of Georgia and Johnstone Strait in Canadian waters are also occasionally used by the whales to transit between inland waters and coastal B.C. Area 3 is predominantly a passage used to access outer coastal waters, including Swiftsure and La Perouse Banks, off Tofino, and Westport, as well as other areas with unknown uses, such as the coast of northern California. Recent observations at Westport coincided with presence of spring Chinook, although other species were also likely present, and feeding was observed (NWFSC unpub. data). The presence of migrating salmonids in the Strait of Juan de Fuca suggests that feeding might occur during transit times, however the whales are not known to spend long periods in localized areas in the Strait. Sightings of the Southern Residents in Area 3 are limited, particulary on the U.S. side of the border as there is little effort in the area, particularly to the west toward the Bonilla/Tattosh boundary.
*The Whale Museum database from 1990-2003 contains 11,836 unique sightings after duplicate locations on the same date are excluded. 8,508 of these are in US waters.		

Appendix B

Figure 1



Appendix C

October 6, 2006

MEMO

To: PRD File for Southern Resident killer whale critical habitat designation

From: Donna Darm

cc: Melanie Rowland

Subject: Designating Critical Habitat for Southern Resident Killer Whales - Considerations for Department of Defense Owned and Controlled Areas and Impacts on National Security

On November 24, 2003, the President signed the National Defense Authorization Act (NDAA) for Fiscal Year 2004 (Public Law No. 108-136) which resulted in several changes to the Endangered Species Act (ESA) (16 U.S.C. 1531 et seq). Key changes to the ESA related to our critical habitat assessment include those described in section 318 of the NDAA with respect to "Military Readiness and Conservation of Protected Species." Specifically, section 4(b)(2) of the ESA (16 U.S.C. 1533(b)(2)) was recently amended to read: "The Secretary shall designate critical habitat, and make revisions thereto, under subsection (a)(3) of this section on the basis of the best scientific data available and after taking into consideration the economic impact, **the impact on national security**, and any other relevant impact, of specifying any particular area as critical habitat. The Secretary may exclude any area from critical habitat if he determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless he determines, based on the best scientific and commercial data available, that the failure to designate such area as critical habitat will result in the extinction of the species concerned." [emphasis added]

During the critical habitat designation process for listed salmon and steelhead ESUs in Washington, NMFS contacted the DOD by letter and requested information about the impacts to national security that may result from designating critical habitat at military sites in Washington. The Army and Navy concluded that critical habitat designation at any of their 24 listed sites would likely impact national security by diminishing military readiness (see 70 FR 52630, September, 2, 2005 for list of the 24 military sites considered).

The Critical Habitat Analytical Review Teams assessed the conservation values of nearshore habitat areas that overlapped with DOD sites and concluded that all of them were of high conservation value to their respective ESUs. However, the overlap areas were a small portion of the total area for the ESUs and designating these DOD sites would likely reduce the readiness capability of the Army and Navy, both of which are actively engaged in training, maintaining, and deploying forces in the current war on

terrorism. In designating critical habitat for 12 ESUs of West Coast Salmon and Steelhead in Washington, Oregon, and Idaho (70 FR 52630, September, 2, 2005), we concluded that the benefits of exclusion outweighed the benefits of designation and did not designate these DOD sites. We determined that these exclusions would not result in extinction of the listed species.

Prior to listing Southern Resident killer whales under the ESA, we contacted the DOD and identified the location of the following 18 military areas (Figure 1), previously evaluated during salmon and steelhead habitat designations, that potentially overlapped with areas under consideration for Southern Resident critical habitat: (1) Naval Undersea Warfare Center, Keyport; (2) Naval Ordnance Center, Port Hadlock (Indian Island); (3) Naval Fuel Depot, Manchester; (4) Naval Air Station, Whidbey Island; (5) Naval Station, Everett; (6) Naval Hospital Bremerton; (7) Puget Sound Naval Ship Yard; (8) Strait of Juan de Fuca naval air-to-surface weapon range, restricted area; (9) Strait of Juan de Fuca and Whidbey Island naval restricted areas; (10) Admiralty Inlet naval restricted area; (11) Port Gardner Naval Base restricted area; (12) Port Orchard Passage naval restricted area; (13) Sinclair Inlet naval restricted area; (14) Carr Inlet naval restricted area; (15) Port Townsend/Indian Island/Walan Point naval restricted area; (16) Crescent Harbor Explosive Ordnance Units Training Area; (17) Fort Lewis (Army); and (18) Pier 23 (Army).

DOD confirmed that these18 of these areas are owned or controlled by the Navy or Army, identified the types of activities that take place in the areas and assessed the potential for critical habitat designation to adversely affect their ability to conduct operations, tests and other essential required training. The Navy also included information for six additional areas in the region (5 Hood Canal locations and an inland site at Jim Creek) which do not overlap with proposed critical habitat and were not considered further. The Army submitted information on Fort Lewis and Pier 23. Both military agencies concluded that critical habitat designation at any of these sites would likely impact national security by diminishing military readiness. The possible impacts include: preventing, restricting, or delaying training or testing exercises or access to sites; restricting or delaying activities associated with vessel/facility maintenance and ordnance loading; and delaying response times for ship deployments and overall operations. Designation of critical habitat also has the potential to impact national security if a section 7 consultation concluded that the Navy needed to change its operations to avoid creating a barrier to killer whale passage. We consider such impacts unlikely based on: the relatively small percentage of large vessels in Puget Sound that are Navy vessels (Mintz and Filadelfo 2004) and the fact that military vessels are rarely observed within ½ mile radius of Southern Residents (Koski 2004, Koski 2006).

Several of the affected DOD sites include nearshore and marine areas adjacent to or overlapping with geographical area occupied by Southern Resident killer whales. Because of mapping imprecision, we cannot determine the extent to which the shore-based facilities may extend into 20-foot deep waters of Puget Sound and therefore the exact amount of overlap with proposed killer whale critical habitat. There are however, marine areas that clearly include waters deeper than 20 feet. The 18 sites, including the

marine areas associated with these sites, cover 112 square miles (291 sq. km) out of the total 2,687 square miles (6,959 sq. km) under consideration as critical habitat for Southern Residents. The shore-based sites cover 81 miles (130 km) of shoreline out of the total 2,081 miles (3,349 km) of shoreline in the areas considered for critical habitat.

Eight of the shore-based military sites are also covered by Integrated Natural Resource Management Plans (INRMPS) that provide conservation benefits for salmon, a primary prey resource for Southern Residents. During designation of critical habitat for listed salmon, we concluded that it is likely that implementing each of these INRMPs will benefit ESA-listed salmon and underscored the close and effective working relationship with each military facility as well as the Department of Defense's proven interest and ability to protect water quality and promote salmon conservation. Some of the key benefits identified included but are not limited to:

(1) Water quality protection via stormwater management, pollution prevention/remediation (e.g., erosion control, minimizing inflight fuel dumps, cleanup of contaminated soils and wetlands);

(2) Habitat protection, restoration, and monitoring that promote conservation of salmon and their prey; and

(3) Environmental programs that promote environmental awareness and actively manage recreational uses (e.g., controlled access and restrictions on motorized boating).

We have assessed the conservation value of the deeper marine areas based on the frequency of presence and use of these areas from the Whale Museum sightings database and other information. Attached is an assessment of killer whale presence, a summary of the Navy's description of activities and the particular national security concerns for marine areas (Attachment 1).

Similar to our conclusion for salmon critical habitat, even though the overlap areas may have conservation value, the overlap is a small percentage (less than 5%) of the total area for Southern Residents. None of the DOD sites are located in Area 1, which is the core summer area and has the highest number of killer whale sightings. Designating these DOD sites will likely reduce the readiness capability of the Navy and Army, which are actively engaged in operations, tests and other essential required training. In addition, on those military sites with INRMPs in place, the benefits of designation are reduced because the plans in place reduce the likelihood that DOD activities will adversely modify critical habitat. Therefore, I recommend concluding that the benefits of exclusion outweigh the benefits of designation and not proposing to designate these DOD sites as critical habitats.

Appendix C

Assessment of Conservation Value and National Security Impacts for DOD Sites with Extensive Marine Habitat

Southern Resident killer whales have been sighted in or adjacent to all 18 DOD sites identified in this memo and in Table 1. Because of mapping imprecision, we cannot determine the extent to which 10 shore-based DOD facilities may extend into 20-foot deep waters of Puget Sound and therefore the exact amount of overlap with proposed killer whale critical habitat. However, the 8 DOD sites described below have extensive overlap with marine areas under consideration as critical habitat and merit more detailed summaries of whale sightings and national security concerns raised by the DOD.

(1) Strait of Juan de Fuca and Whidbey Island naval restricted, (2) Crescent Harbor Explosive Ordnance Units Training Area; and (3) Admiralty Inlet, naval restricted area
Southern Resident killer whale presence: These related DOD sites are within Area 2 (Puget Sound) and Area 3 (Strait of Juan de Fuca) and lie within quadrants identified by the Whale Museum with sightings of whales on 1-25 days from 1990-2003. These sites are located near the border of Area 1 in the vicinity of the west side of San Juan Island where the highest numbers of sightings were recorded. The Southern Residents use Admiralty Inlet as a corridor between the core summer area around the San Juan Islands and the fall/winter area in Puget Sound. The whales feed in the core summer area and in Puget Sound, so Admiralty Inlet represents a corridor between feeding areas. Admiralty Inlet is used September-April, but is not the only corridor available to the whales and they have also traveled through Deception Pass.
Navy Description of Facilities and Activities: The primary mission of Naval Air Station (NAS) Whidbey Island is to provide the highest quality facilities, services and products to the naval aviation community and all organizations utilizing the sites at AULT Field, Seaplane Base and Outlying Field, Coupeville. Tenant commands at NAS Whidbey Island, such as Explosive Ordnance Disposal Mobile Unit ELEVEN (EODMU 11), rely on accessible nearshore and offshore environments to fulfill mission-essential training requirements. EODMU 11 provides combat support for the location, identification, rendering safe, recovery, field evaluation and disposal of all explosive ordnance in littoral and open ocean regions, including security and mine protection. Admiralty Inlet, restricted area is an open water marine area for support of operations at Naval Air Station Whidbey Island.
National Security Concerns: The Navy believes that critical habitat designation in open water areas could pose an unacceptable detriment to its installations' capability to adequately support military training and operations, especially explosive ordinance training. Any degradation of the site's capacity or capability to fulfill ordnance support requirements of Fleet assets represents a significant impact on the installation's military readiness function.

(4) Strait of Juan de Fuca naval air-to-surface weapon range, restricted area
Southern Resident killer whale presence: This DOD site is within Area 3 (Strait of Juan de Fuca) and lies within quadrants identified by the Whale Museum as having 1-25 sightings.

Appendix C

Navy Description of Facilities and Activities: Home ported ships and ships worked upon at the Puget Sound Naval Shipyard (PSNS) use this open water marine area to test shipboard equipment prior to departing Puget Sound.
National Security Concerns: Navy ships use this range (including associated security/restricted zones) to support military training and testing operations critical to these ships performing their defense missions all over the world.

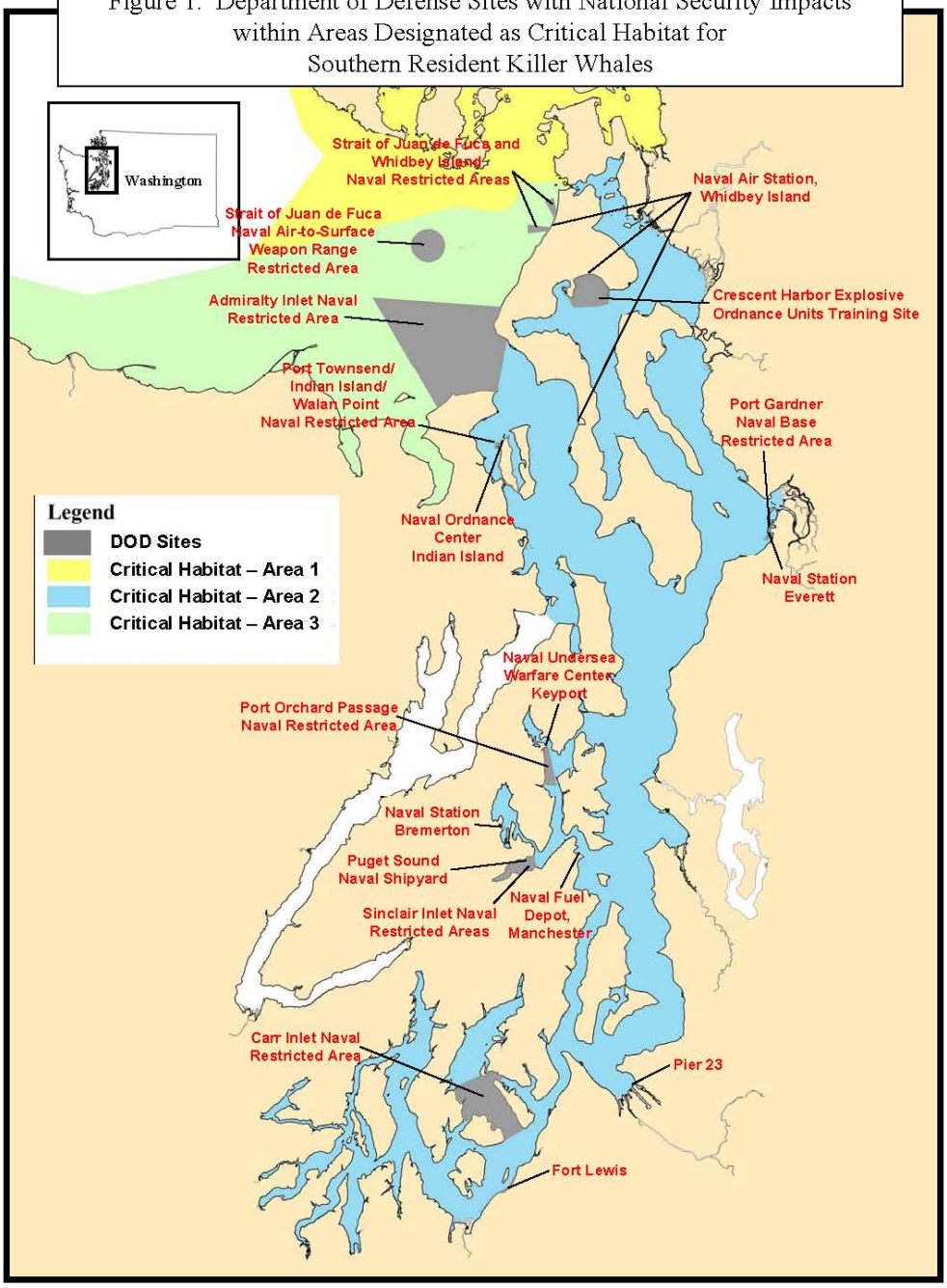
(5) Naval Undersea Warfare Center, Keyport associated range (NUWC)
Southern Resident killer whale presence: This site is located in Area 2 and there has been only one sighting of Southern Residents reported in the vicinity of Keyport and the associated range.
Navy Description of Facilities and Activities: NUWC Keyport provides state-of-the-art infrastructure and capabilities in the Pacific Northwest that have been essential to the Navy's comprehensive underwater test and evaluation programs for undersea weapons, Unmanned Underwater Vehicles, and related combat systems. NUWC Keyport's access to the adjacent waterfront and to underwater test ranges is mission critical for NUWC's role in providing integrated Undersea Warfare Systems Dependability, Integrated Mine and Undersea Warfare Supportability and Undersea Vehicle Maintenance and Engineering. The in-water environments in the Puget Sound area and surrounds are essential for Keyport's evaluation of systems in both surrogate and real war-fighting environments.
National Security Concerns: The Navy believes that critical habitat designation could pose an unacceptable detriment to its installations capability to adequately support military training and operations. NUWC testing activities to support military readiness requires precision underwater tracking capabilities and underwater test sites adjacent to Keyport are critical to these functions, and limitations on access to, use of, or enhancement of the capabilities and capacities of these ranges would curtail both testing and mission critical Fleet support functions.

(6) Sinclair Inlet naval restricted area and (7) Puget Sound Naval Shipyard
Southern Resident killer whale presence: These sites are within Area 2 and lie within quadrants identified by the Whale Museum as having 26-100 sightings. These sites lie within the same quadrant as Dyes Inlet where Southern Residents spent an extended amount of time in 1997. This particular extended event likely accounts for a majority of the sightings in the general area rather than sightings in Sinclair Inlet or near the Puget Sound Naval Shipyard itself.
Navy Description of Facilities and Activities: This area is support and security zone for the Shipyard.
National Security Concerns: Ships undergoing maintenance must complete their maintenance periods and return to service on time to ensure overall fleet readiness. The PSNS and Intermediate Maintenance Facility (IMF) mission is to perform ship maintenance and repairs and return those ships to the Fleet within restricted timeframes. Any restrictions impacting the arrival, departure or length of maintenance periods significantly impacts Fleet schedule and, therefore, the Navy's ability to deploy ships to defend our nation and its allies.

(8) Carr Inlet naval restricted area
Southern Resident killer whale presence: This site is within Area 2 and only a small number of sightings (1-5) in the entire area south of Tacoma Narrows Bridge have been reported.
Navy Description of Facilities and Activities: This is one of the Navy's open water marine area Test Ranges in Puget Sound for non-explosive acoustic research activities conducted at NUWC Keyport.
National Security Concerns: The Navy believes that critical habitat designation could pose an unacceptable detriment to its installations' capability to adequately support military training and operations. NUWC testing activities to support military readiness requires precision underwater tracking capabilities and underwater test sites adjacent to Keyport are critical to these functions, and limitations on access to, use of, or enhancement of the capabilities and capacities of these ranges would curtail both testing and mission critical Fleet support functions.

Appendix C

Figure 1. Department of Defense Sites with National Security Impacts within Areas Designated as Critical Habitat for Southern Resident Killer Whales



Appendix C

Table 1 – Summary of Estimated Overlap Between DOD Sites and Areas Under Consideration as Critical Habitat for Southern Resident Killer Whales.

DOD Sites & Agency	INRMP?	Proposed Habitat Area(s)*	Overlap-ping DOD Site#	Shoreline Overlap of DOD Site and Proposed Habitat Areas (mi.)	Net Shoreline Overlap with Proposed Habitat Areas (mi.)		Marine Area Overlap of DOD Site and Proposed Habitat Areas (sq. mi.)	Net Marine Area Overlap with Proposed Habitat Areas (sq. mi.)	
(1) Naval Undersea Warfare Center, Keyport - Navy	Yes	2	12	2.7	Sites 1 & 12	3.5	0.1	Sites 1 & 12	2.3
(2) Naval Ordnance Center, Port Hadlock (Indian Island) - Navy	Yes	2	15	13.8	Sites 2 & 15	13.8	0.7	Sites 2 & 15	0.7
(3) Naval Fuel Depot, Manchester - Navy	Yes	2	none	1.6	Site 3 only	1.6	0.1	Site 3 only	0.1
(4) Naval Air Station, Whidbey Island - Navy	Yes	2 & 3	9 & 14	15.2	Sites 4 & 9 & 14	15.2	1.4	Sites 4 & 9 & 14	11.1
(5) Naval Station, Everett - Navy	Yes	2	11	1.7	Sites 5 & 11	2	0.2	Sites 5 & 11	0.3
(6) Naval Station Bremerton - Navy	Yes	2	none	0.4	Site 6 only	0.4	0.1	Site 6 only	0.1
(7) Puget Sound Naval Ship Yard - Navy	No	2	13	2.8	Sites 7 & 13	11.2	0.4	Sites 7 & 13	3.7
(8) Strait of Juan de Fuca naval air-to-surface weapon range, restricted area - Navy	No	3	none	0	Site 8 only	0	6.5	Site 8 only	6.5
(9) Strait of Juan de Fuca and Whidbey Island naval restricted areas - Navy	No	3	4	0.9	See site 4 above	na	1.9	See site 4 above	na
(10) Admiralty Inlet naval restricted area - Navy	No	2 & 3	none	9.5	Site 10 only	9.5	69.1	Site 10 only	69.1
(11) Port Gardner Naval Base restricted area - Navy	No	2	5	1.8	See site 5 above	na	0.2	See site 5 above	na
(12) Port Orchard Passage naval restricted area - Navy	No	2	1	4.4	See site 1 above	na	2.2	See site 1 above	na
(13) Sinclair Inlet naval restricted areas (1 & 2) - Navy	No	2	7	11.1	See site 7 above	na	3.7	See site 7 above	na
(14) Carr Inlet naval restricted area - Navy	No	2	na	20.1	Site 14 only	20.1	17.5	Site 14 only	17.5
(15) Port Townsend/Indian Island/Walan Point naval restricted area - Navy	No	2	2	0.5	See site 2 above	na	0.2	See site 2 above	na
(16) Crescent Harbor Explosive Ordnance Units Training Area	No	2	4	6.8	See site 4 above	na	7.8	See site 4 above	na
(17) Fort Lewis - Army	Yes	2	na	3.7	Site 17 only	3.7	0.4	Site 17 only	0.4
(18) Pier 23 - Army	Yes	2	na	<0.1	Site 18 only	<0.1	<0.1	Site 18 only	<0.1

* 1 = Core Summer Area
2 = Puget Sound Area
3 = Strait of Juan de Fuca Area