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Economic Analysis of Critical Habitat Designation for the Georgia Basin/Puget Sound Distinct Population Segments of Yelloweye Rockfish, Canary Rockfish, and Bocaccio

Draft | August, 2013

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EXECUTIVE SUMMARY

INTRODUCTION

The purpose of this report is to identify and analyze the potential economic impacts associated with the designation of critical habitat for the Puget Sound/Georgia Basin Distinct Population Segments (DPSs) of yelloweye rockfish, canary rockfish, and bocaccio (hereafter, "rockfish") under the U.S. Endangered Species Act (ESA). The analysis examines the potential impacts of restricting or modifying specific land or water use activities to avoid adverse modification or destruction of critical habitat for these species.

This report is intended to assess potential economic impacts of designating each area considered for designation as critical habitat for the rockfish. A separate Biological Report summarizes the best available information on yelloweye rockfish, canary rockfish, and bocaccio life history, distribution, and habitat use relevant to critical habitat designation. In designating critical habitat, the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (hereafter, "NOAA Fisheries") must consider the economic impact, impact to national security, and other relevant impacts of designating each particular area. NOAA Fisheries may weigh the biological conservation benefits of designation against the economic impacts and other relevant impacts, and may exercise its discretion to exclude areas where the benefits of exclusion outweigh the benefits of designation.[1] What weight to give impacts, and whether to exclude any areas, is within the discretion of NOAA Fisheries. The consideration of impacts is documented in a draft ESA 4(b)(2) report supporting NOAA Fisheries' proposed critical habitat designation.

APPROACH

This analysis examines the state of the world with and without the designation of critical habitat for rockfish. The "without critical habitat" scenario represents the baseline for the analysis, considering habitat protections already afforded rockfish under their Federal ESA listings or under other Federal, State, and local regulations, including protections

[1] Section 3(5)(A) of the ESA defines critical habitat as ''(i) the specific areas within the geographical area occupied by the species, at the time it is listed . . . 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 . . . upon a determination by the Secretary that such areas are essential for the conservation of the species.'' Section 4(b)(2) of the ESA requires NMFS to designate critical habitat for threatened and endangered species "on the basis of the best scientific data available and after taking into consideration the economic impact, impact on national security, and any other relevant impact, of specifying any particular area as critical habitat." In addition, "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 that the failure to designate such an area as critical habitat will result in the extinction of the species concerned."

afforded them from the ESA listing and critical habitat designations for listed species.[2] The "with critical habitat" scenario endeavors to describe the incremental economic impacts associated with the designation of critical habitat for the species. While this analysis provides a qualitative discussion of baseline conservation efforts, including protections provided under the listing of the species, the focus of the analysis is determining the increment of costs that is attributable to critical habitat designation.

To quantify the economic impacts of modifications to land and water uses that result from critical habitat designation, the analysis employs the following three steps:

- Define the geographic study area for the analysis, and identify the units of analysis. In this case, the five biogeographic basins[3] of the Puget Sound assessed for critical habitat are defined as the study area.[4]
- Based on the potentially affected economic activities, determine how management, including both project modification and administrative costs, may increase due to the designation of critical habitat for rockfish.
- Estimate the economic impacts associated with this change in management.

These steps are described in greater detail in Section 2.

RESULTS

We assess potential critical habitat effects in the five biogeographic basins of the Puget Sound. These basins total approximately 6,039.3 square kilometers (km) (2,331.8 square miles). A high level of baseline protections for listed rockfish in Puget Sound occur from: 1) the presence of other listed species. Additional ESA-listed species in the Puget Sound include Puget Sound Chinook salmon and steelhead, Hood Canal summer-run chum salmon, bull trout, eulachon, green sturgeon, southern resident killer whales, and Stellar sea-lions. The ESA affords protections to listed species without the designation of critical habitat, and 2) the presence of designated critical habitat for some of these other species. Of the listed species that occur in Puget Sound, all but eulachon and Stellar sea lions have critical habitat designated in portions of the Puget Sound. Many of the physical or biological features noted in the critical habitat designations for these other species as essential to their conservation are similar to those of the listed rockfishes. Within the five basins assessed for rockfish critical habitat, a total of 67 consultation

[2] Section 2 presents a comparison of the physical or biological features essential for conservation of the species with those of killer whale, green sturgeon, and Chinook salmon, as well as other salmonids.

[3] These five interconnected basins include: (1) The San Juan/Strait of Juan de Fuca Basin, (2) Main Basin, (3) Whidbey Basin, (4) South Puget Sound, and (5) Hood Canal.

[4] Under section 4(b)(2) of the ESA, the Secretary of Commerce must consider the economic impact of designating any "particular area" as critical habitat. The 4(b)(2) designation process therefore operates at a geographic scale that (potentially) divides the area(s) under consideration into smaller subareas. The statute does not specify the exact geographic scale of these subareas, nor does it dictate the form of the economic analysis and the nature of the impacts to be included in the analysis. This analysis defines these "particular areas" as the five basins of the Puget Sound. These areas also meet the definition of specific areas under (3)(5)(A) of the ESA because he essential physical and biological features for juvenile rearing and/or adult reproduction, sheltering, or feeding for yelloweye rockfish, canary rockfish, and bocaccio are located within these specific areas (see NMFS 2013).

actions were recorded in NOAA's Public Consultation Tracking System (PCTS) database for rockfish between 2010 and 2011, or approximately 33.5 actions annually.[5]

Because of the high level of baseline protection in areas assessed for critical habitat, the need for additional incremental project modifications for rockfish related to activities occurring in potential critical habitat areas are uncertain, though any modifications are anticipated to be small or nonexistent within most management settings within the study area. This is because, for most projects in these areas, NOAA Fisheries would already be recommending modifications to avoid jeopardizing the continued existence, or adversely modifying the critical habitat, of other listed species. In these cases, considering rockfish critical habitat in consultations may require relatively little additional modification to the project, and subsequent economic impact, over and above that already expected to occur due to the presence of other listed species.

This analysis quantifies projected future administrative costs of engaging in section 7 consultation activities that consider the rockfish and its critical habitat. We estimate the number of future consultations by consultation type and activity based on the past consultation history for listed species under NOAA Fisheries' jurisdiction in the five basins assessed for critical habitat designation. Then, using a model of consultation costs built from a survey of NOAA and Federal action agency efforts, each consultation is assigned an estimated level of administrative effort based on the type of activities expected to be the subject of the consultation.

As shown in Exhibit ES-1, total annualized impacts of designating all areas assessed for rockfish critical habitat are estimated to be $123,000 (assuming a seven percent discount rate). In Exhibit ES-2, annualized incremental impacts are also presented by economic activity. This analysis anticipates projects related to the following activities to incur incremental impacts in the form of increased administrative burden: nearshore work, transportation, water quality, utilities, and "other" activities such as fishing and aquaculture.

[5] As the consultation record for the year 2009 was sparsely populated, and the rockfish species were only listed in April 2010, the analysis calculates annual rate of consultation assuming two years of consultations, from 2010-2011.

EXHIBIT ES-1. SUMMARY OF ANNUAL INCREMENTAL COSTS BY BASIN. ALL INCREMENTAL COSTS ARE ADMINISTRATIVE.

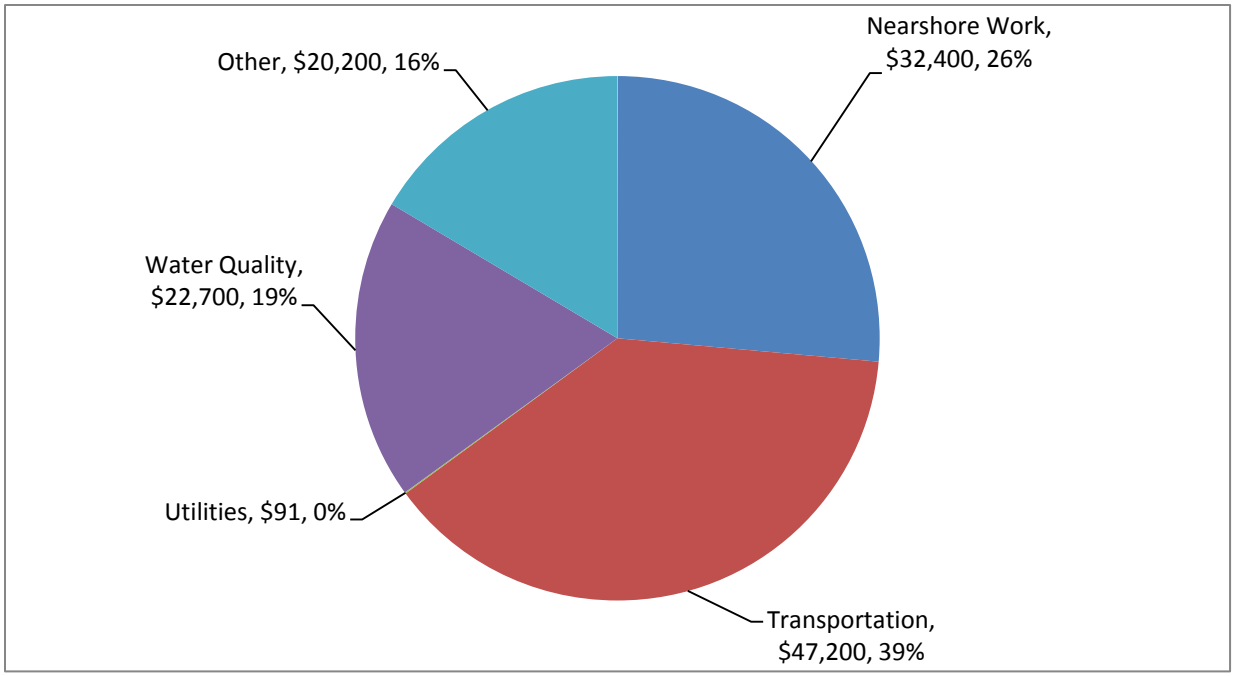
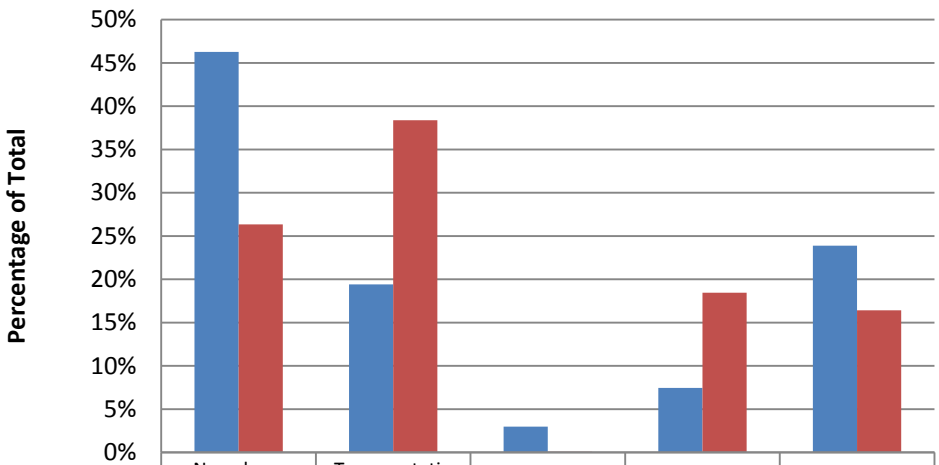


EXHIBIT ES-2. SUMMARY OF ANNUAL INCREMENTAL COSTS BY ACTIVITY (PRESENT VALUE). ALL INCREMENTAL COSTS ARE ADMINISTRATIVE.

NAME	PRESENT VALUE (SEVEN PERCENT)	PRESENT VALUE (THREE PERCENT)	ANNUALIZED (SEVEN PERCENT)	ANNUALIZED (THREE PERCENT)
San Juan/Strait of Juan de Fuca Basin	$364,000	$492,000	$32,100	$32,100
Whidbey Basin	$341,000	$461,000	$30,100	$30,100
Main Basin	$329,000	$444,000	$29,000	$29,000
Hood Canal	$116,000	$156,000	$10,200	$10,200
South Puget Sound	$240,000	$325,000	$21,200	$21,200
Total	**$1,390,000**	**$1,880,000**	**$123,000**	**$123,000**
Note: Totals may not sum due to rounding.				

For rockfish, as shown in Exhibit ES-3, the largest expected number of consultations is related to nearshore work activities (which include activities such as boat, dock, and pier and bulkhead construction and repair) and "other" projects, followed by transportation, water quality, and utilities projects. Because transportation consultations are relatively numerous and have higher per-consultation administrative costs (see Exhibit 3-3), they represent the largest share of incremental administrative costs.

EXHIBIT ES-3. PERCENTAGE OF TOTAL CONSULTATIONS AND PERCENTAGE OF TOTAL ANNUAL COSTS, BY ACTIVITY



	Nearshore Work	Transportation	Utilities	Water Quality	Other
Consultations	46%	19%	3%	7%	24%
Costs	26%	38%	0%	18%	16%

SECTION 1 | INTRODUCTION

1.1 INTRODUCTION

The purpose of this report is to identify and analyze the potential economic impacts associated with designating ESA critical habitat for the Puget Sound/Georgia Basin DPSs of yelloweye rockfish, canary rockfish, and bocaccio. The analysis examines the potential impacts of restricting or modifying specific land or water use activities to avoid destruction or adverse modification of critical habitat.

This section provides a brief introduction to the process of designating critical habitat for rockfish. It includes a summary of threats to the species' habitat, and maps of basins assessed and the surrounding study area.

1.2 AREAS ASSESSED FOR CRITICAL HABITAT DESIGNATION

On April 28, 2010, the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service listed the Puget Sound/Georgia Basin DPSs of yelloweye rockfish and canary rockfish as threatened under the Endangered Species Act (Act) and listed the Puget Sound/Georgia Basin DPS of the bocaccio as endangered under the Act.[6] The listing rule states that the primary factors responsible for the decline of the species include past fishery removals, the destruction, modification, or curtailment of habitat, and inadequacy of existing regulatory mechanisms.

Puget Sound can be subdivided into biogeographic basins that encompass contiguous, ecologically unique, and spatially isolated freshwater, estuarine, and marine habitats (Downing 1983; Burns 1985). These five interconnected basins include: (1) The San Juan/Strait of Juan de Fuca Basin, (2) Main Basin, (3) Whidbey Basin, (4) South Puget Sound, and (5) Hood Canal (Exhibit 1-1). Areas assessed as possible critical habitat for rockfish in these basins include a total of 3,862 kilometers (2,400 lineal miles) of nearshore,[7] and certain deepwater areas outside of the nearshore of Puget Sound, Washington (NMFS 2013).

Exhibit 1-2 summarizes the physical and biological features essential for rockfish conservation as well as features for critical habitat previously designated in Puget Sound. The features of designated Puget Sound Chinook salmon, summer-run Chum salmon, and green sturgeon as well as bull trout critical habitat have the most similarity to the features

[6] 75 FR 22276.

[7] The term nearshore refers to waters that are contiguous with the shoreline from the line of extreme high water extending outward to the termination of the photic zone (upper layer of a water body delineated by the depth at which enough sunlight can penetrate to allow photosynthesis), which is approximately 98 feet (30 meters) deep.

of proposed rockfish critical habitat. This similarity is derived from similar habitat requirements that include appropriate habitat structure and sufficient water quality.

This report describes and quantifies potential economic impacts associated with designating critical habitat for rockfish in these areas (seen in Exhibit 1-1), focusing on economic activities and resource uses that NOAA Fisheries has identified as a potential threat, including nearshore construction, point and non-point source pollution, aquaculture, certain fisheries, non-native species removal, and utilities activity.

EXHIBIT 1-1. AREA ASSESSED FOR ROCKFISH CRITICAL HABITAT

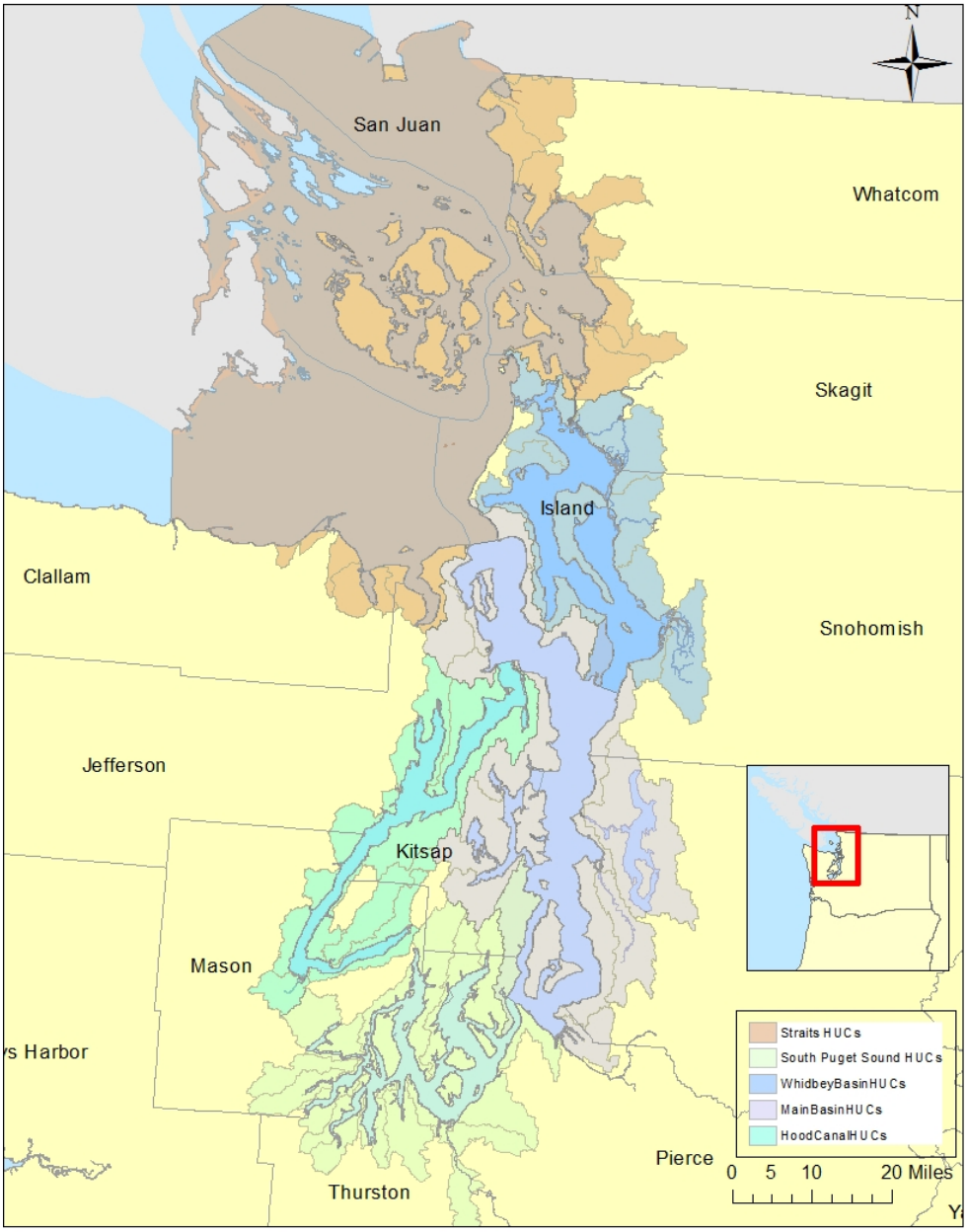


Exhibit 1-1. Area Assessed for rockfish critical habitat--HUCs stand for Hydrologic Unit Code.

EXHIBIT 1-2. COMPARISON OF PHYSICAL AND BIOLOGICAL FEATURES AND PRIMARY CONSTITUENT ELEMENTS FOR ROCKFISH AND OTHER RELEVANT LISTED SPECIES IN PUGET SOUND

ROCKFISH (DRAFT FEATURES)	PUGET SOUND CHINOOK & HOOD CANAL SUMMER-RUN CHUM SALMON	SOUTHERN RESIDENT KILLER WHALE	SOUTHERN DPS OF GREEN STURGEON	BULL TROUT
Puget Sound and Hood Canal Nearshore and Marine Waters	Puget Sound and Hood Canal nearshore[1]	Puget Sound marine waters deeper than 20 feet relative to extreme high water (not including Hood Canal)	San Juan Basin only from nearshore to 60 fathoms depth	Some nearshore habitat in Puget Sound.
BENTHIC HABITATS				
Sites deeper than 30 m (98 ft) that possess (or are adjacent to) areas of complex bathymetry. These features are essential to conservation because they support growth, survival, reproduction, and feeding opportunities by providing the structure to avoid predation, seek food, and persist for decades.	N/A	N/A	See Forage/Prey.	N/A
REARING HABITAT/MIGRATION				
Juvenile settlement habitat of *canary rockfish* and *bocaccio* located in the nearshore (shallower than 30 meters) with substrates such as sand, rock and/or cobble compositions that also support kelp. Juvenile settlement benthic habitat of *yelloweye rockfish* (deeper than 30 meters) that supports forage opportunities and sheltering from predation.	Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels.	Passage conditions to allow for migration, resting, and foraging.	A migratory pathway necessary for the safe and timely passage of the Southern DPS fish within marine and between estuarine and marine habitats.	Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine habitats, including, but not limited to permanent, partial, intermittent, or seasonal barriers. Sufficient water quality such that normal reproduction, growth, and survival are not inhibited.
WATER QUALITY				
Water quality with sufficient levels of dissolved oxygen to support survival, full habitat	Water quality and quantity conditions and forage, including aquatic	Water quality to support growth and development.	Nearshore marine waters with adequate dissolved	(Freshwater) Springs, seeps, groundwater sources, and subsurface

ROCKFISH (DRAFT FEATURES)	PUGET SOUND CHINOOK & HOOD CANAL SUMMER-RUN CHUM SALMON	SOUTHERN RESIDENT KILLER WHALE	SOUTHERN DPS OF GREEN STURGEON	BULL TROUT
use and behaviors, and contaminant levels that do not inhibit growth, predator avoidance, development, and reproduction.	invertebrates and fishes, supporting growth and maturation.		oxygen levels and acceptably low levels of contaminants that may disrupt behavior, growth, and viability of subadult and adult green sturgeon.	water connectivity to contribute to water quality and quantity and provide thermal refugia. Water temperatures ranging from 2 to 15 degrees Celsius with adequate thermal refugia available for temperatures that exceed the upper end of this range. Sufficient substrate for spawning (freshwater).
FORAGE/PREY				
Prey species of sufficient quantity, quality, and availability to support individual growth, reproduction, and development.	Forage including aquatic invertebrates and fishes, supporting growth and maturation.	Prey species of sufficient quantity, quality, and availability to support individual growth, reproduction, and development, as well as overall population growth.	Abundant prey items for subadults and adults, which may include benthic invertebrates and fishes.	Complex marine shoreline aquatic environments and processes with features such as large wood, side channels, pools, undercut banks, and substrates to provide a variety of depths, gradients, velocities, and structure.

[1]Hood Canal summer-run chum salmon critical habitat is designated along 377 miles of nearshore marine habitats in the Hood Canal basin and portions of the San Juan / Strait of Juan de Fuca Basin. These nearshore areas completely overlap with Puget Sound Chinook salmon critical habitat.

Sources: Written communication with NOAA biologist on August 19, 2011; Final Rule to Designate Critical Habitat for the Threatened Southern Distinct Population Segment of North American Green Sturgeon, Final Rule, October9, 2009; Critical habitat for 12 Evolutionarily Significant Units (ESUs) of salmon and steelhead (*Oncorhynchus spp*.) in Washington, Oregon, and Idaho, September 2, 2005; Endangered and Threatened Species; Designation of Critical Habitat for Southern Resident Killer Whale, Final Rule, November 29, 2006; Revised Designation of Critical Habitat for Bull Trout in the Coterminous United States, Final Rule, October 18, 2010.

Section 4(b)(2) of the ESA requires NOAA Fisheries to designate critical habitat for threatened and endangered species "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." This section grants the Secretary discretion to exclude any area from critical habitat if he determines "the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat." In adopting this provision, Congress explained that, "[t]he

consideration and weight given to any particular impact is completely within the Secretary's discretion" H.R. No.95-1625, at 16-17 (1978). The Secretary's discretion to exclude is limited, as he may not exclude areas that "will result in the extinction of the species." NOAA Fisheries has discretion in whether and how to balance benefits. This analysis defines the "particular areas" as the "specific areas" identified in the biological report (NMFS 2013), which is the five basins of Puget Sound, as mapped by NOAA's National Marine Fisheries Services in Washington.

Based on these maps, in order to capture all potentially affected economic activity, the analysis defines the study area as the five biogeographic basins of the Puget Sound containing areas considered for critical habitat. In total, the areas assessed for critical habitat comprise approximately 6,039.3 square km (2,331.8 square miles). Of this, NOAA Fisheries has proposed 3,068.6 square km (1,184.8 square miles) as potential critical habitat for rockfish.[8] We used NOAA's PCTS database to assess the number of consultations that included listed rockfish. The PCTS system identifies the location of the project by six field hydrologic units (HUCs) or watersheds. When a project occurs in marine waters (which are technically outside the boundaries of freshwater HUCs), its HUC location is entered in PCTS based on the nearest freshwater HUC (Exhibit 1-3). For this study, we searched the PCTS database for all HUCs adjacent to marine waters and included in our analysis any consultation that included rockfish.

[8] This number is for critical habitat for canary rockfish and bocaccio, a subset of which is proposed critical habitat for yelloweye rockfish (610.4 acres).

EXHIBIT 1-3. ROCKFISH HABITAT BASINS BY HUC

	HOOD CANAL	MAIN BASIN	SAN JUAN/STRAIT OF JUAN DE FUCA BASIN	SOUTH PUGET SOUND	WHIDBEY BASIN
Sixth Field HUCs	171100170204, 171100180102, 171100180103, 171100180104, 171100180106, 171100180107, 171100180108, 171100180301, 171100180303, 171100180304, 171100180701, 171100180703, 171100180704, 171100180800, 171100191200	171100120400, 171100130305, 171100190203, 171100190204, 171100190403, 171100190404, 171100190703, 171100190704, 171100190705, 171100190706, 171100190707, 171100191000, 171100191200	171100020101, 171100020201, 171100020202, 171100020203, 171100020304, 171100020401, 171100020402, 171100020403, 171100020501, 171100020502, 171100020600, 171100030100, 171100030200, 171100030300, 171100030500, 171100040506, 171100040601, 171100040604, 171100040605, 171100040700, 171100190101, 171100190102, 171100190105, 171100190106, 171100191100, 171100191300, 171100200102, 171100200103, 171100200202, 171100200203, 171100200204, 171100200404, 171100200700	171100150307, 171100190301, 171100190304, 171100190401, 171100190402, 171100190501, 171100190502, 171100190503, 171100190504, 171100190505, 171100190601, 171100190603, 171100190604, 171100190606, 171100190608, 171100190610, 171100190701, 171100190702, 171100190703, 171100190900	171100070204, 171100080304, 171100110203, 171100190101, 171100190102, 171100190103, 171100190104, 171100190105, 171100190107, 171100190201, 171100190202, 171100190203, 171100190801, 171100190802, 171100190803, 171100191100, 171100191200
Total Acres	**338,200**	**775,300**	**1,810,600**	**503,500**	**416,600**

1.3 BRIEF OVERVIEW OF REGIONAL DEMOGRAPHICS

The five basins that contain areas assessed for critical habitat for rockfish intersect nine counties in the State of Washington. The overall population of these counties was 4.1 million in 2010, as presented in Exhibit 1-5. The largest population center in the study area is the Seattle, Washington area (King County, Washington).[9] Whatcom County, Washington exhibited the fastest recent population growth of study area counties, increasing in population by 20.6 percent between 2000 and 2010, which is more than twice the national average. Study area counties as a whole displayed higher population growth rates than the national average between 2000 and 2010. Specifically, the population of study area counties grew at 14.1 percent during this time period, while the overall U.S. population increased by 9.7 percent.

EXHIBIT 1-5. AREA AND POPULATION STATISTICS BY COUNTY

COUNTY	POPULATION (2010)	PERCENTAGE CHANGE (2000-2010)	AREA (SQUARE MILES)	POPULATION DENSITY (PERSONS PER SQUARE MILE)
Washington				
Island County	78,506	9.7%	209	377
Jefferson County	29,872	15.1%	1,804	17
King County	1,931,249	11.2%	2,116	913
Kitsap County	251,133	8.3%	395	636
Pierce County	795,225	13.5%	1,670	476
San Juan County	15,769	12.0%	174	91
Skagit County	116,901	13.5%	1,731	68
Snohomish County	713,335	17.7%	2,087	342
Whatcom County	201,140	20.6%	2,107	96
Study Area Total	**4,133,130**	**13.51%**	**12,293**	**335**
Washington Total	6,724,540	14.1%	66,456	101.2
United States	308,745,538	9.7%		

Source: US Census data. Retrieved on November 11, 2011. Available at: http://quickfacts.census.gov/qfd/states/01000.html

1.4 REPORT ORGANIZATION

The remainder of this report includes the following sections:

- Section 2. This section describes the framework and baseline for this analysis.
- Section 3. This section describes potential incremental impacts resulting from the designation of critical habitat for rockfish.
- Appendix A. This appendix presents the Initial Regulatory Flexibility Analysis.

[9] US Census data. Retrieved on August 2, 2011. Available at: http://quickfacts.census.gov/qfd/states/01000.html

- Appendix B. This appendix summarizes laws and regulations that may provide baseline protection for rockfish.
- Appendix C. This appendix provides additional cost data on quantified administrative and project modification costs.

SECTION 2 | FRAMEWORK AND BASELINE FOR THE ANALYSIS

2.1 INTRODUCTION

This analysis examines the potential impacts of restricting or modifying specific land or water uses or activities, as identified by NOAA Fisheries, to avoid adverse modification or destruction of critical habitat during section 7(a)(2) consultation. Section 7(a)(2) of the ESA requires Federal agencies (Action agencies) to consult with NOAA Fisheries whenever activities that they undertake, authorize, or fund may affect a listed species or designated critical habitat. In some cases, consultations will involve NOAA Fisheries and another Federal agency only, such as the U.S. Army Corps of Engineers (USACE). Often, they will also include a third party, such as the recipient of a Clean Water Act section 404 permit.

During a consultation, NOAA Fisheries, the Federal action agency, and the entity applying for Federal funding or permitting (if applicable) communicate in an effort to minimize potential adverse effects to the species and/or to the areas assessed for critical habitat. The duration and complexity of these interactions depends on a number of variables, including the type of consultation, the species, the activity of concern, and the potential effects to the species and designated critical habitat associated with the proposed activity, the Federal agency, and whether there is a private applicant involved.

Section 7 consultations may be either informal or formal. *Informal consultation*s are ones that may affect, but are unlikely to adversely affect listed species and/or their designated critical habitat. They consist of discussions concerning an action and are designed to identify and resolve concerns so that it remains an informal consultation. By contrast, a *formal consultation* is required if the Federal action agency determines that its proposed action may or will adversely affect the listed species or designated critical habitat. The formal consultation process results in determination by NOAA Fisheries as to whether the action is likely to jeopardize a species or adversely modify critical habitat, and includes terms and conditions to minimize expected impacts. Regardless of the type of consultation or proposed project, section 7 consultations can require substantial administrative effort on the part of all participants depending on the complexity of the particular Federal action and the potential effects to listed species and/or critical habitat. Programmatic consultations are similar to formal consultations except that they generally evaluate planning documents or broad programs that cover a broad suite of activities or projects (e.g., USACE regional general permits).

This section presents the framework applied to analyze the economic impacts of critical habitat designation, and includes a description of baseline protections already in place that benefit the species.

2.2 GENERAL FRAMEWORK FOR THE ECONOMIC ANALYSIS

NOAA Fisheries may weigh the biological conservation benefits of designation against the economic impacts and other relevant impacts, and may exercise its discretion to exclude areas where the benefits of exclusion outweigh the benefits of designation. What weight to give impacts, and whether to exclude any areas, is within the discretion of NOAA Fisheries.[10]

This economic analysis addresses the economic impact that NOAA Fisheries is required to consider under ESA section 4(b)(2). These other reports also present more detailed biological information regarding rockfish, including the presence of identified physical or biological features essential for conservation in the areas assessed for critical habitat designation.

2.3 IMPACTS THAT ARE THE FOCUS OF THIS ANALYSIS

This analysis examines the state of the world with and without the designation of critical habitat for rockfish. The "without critical habitat" scenario represents the baseline for the analysis, considering protections already afforded rockfish habitat under the Federal listing rule or under other Federal, State, and local regulations. It also includes protections afforded to rockfish resulting from protections for other listed species. These protections are associated with the ESA listing of Puget Sound Chinook salmon and steelhead, Hood Canal summer-run chum salmon, bull trout, eulachon, green sturgeon, Southern Resident killer whales, and Stellar sea-lions and the designation of critical habitat for salmonids, killer whales, and green sturgeon where they overlap with proposed rockfish critical habitat.[11] Also included under the baseline are protections already afforded rockfish under their ESA listing. The "with critical habitat" scenario attempts to describe the incremental impacts associated specifically with the designation of critical habitat for rockfish.

The social welfare impacts of critical habitat designation generally reflect "opportunity costs" associated with the commitment of resources required to accomplish species and habitat conservation. For example, if a set of activities that may take place on a parcel of land are limited as a result of the designation or the presence of the species, and thus the market value of that land is reduced, this reduction in value represents one measure of opportunity cost. Similarly, the costs incurred by a Federal action agency to consult with NOAA Fisheries under ESA section 7 represent opportunity costs related to rockfish conservation, as the time and effort associated with those consultations would have been spent on other endeavors absent the listing of the species or critical habitat designation.

At the guidance of OMB and in compliance with Executive Order 12866, "Regulatory Planning and Review," Federal agencies measure changes in economic efficiency in order

[10] National Marine Fisheries Service, Northwest Fisheries Science Center. August 2005. Final Economic Analysis of Critical Habitat Designation for 12 West Coast Salmon and Steelhead DPSs.

[11] All proposed rockfish critical habitat in the nearshore overlaps with salmonid critical habitat. All proposed deepwater critical habitat overlaps with killer whale and green sturgeon critical habitat with the exception 50.06 acres of Hood Canal. Green sturgeon critical habitat overlaps in portions of the San Juan Basin.

to understand how society, as a whole, will be affected by a regulatory action. Economists generally characterize opportunity costs in terms of changes in producer and consumer surpluses (i.e., social welfare impacts) in affected markets.[12]

2.3.1 BASELINE FOR THE ECONOMIC ANALYSIS

The first step in the economic analysis is to identify the baseline level of protection afforded rockfish and its habitat. This section provides a description of the methodology used to identify baseline conditions and incremental impacts stemming from the potential designation of critical habitat for rockfish.

The baseline for this analysis is the existing state of regulation prior to the designation of critical habitat that provides protection to the species under the ESA and other Federal, State and local laws and guidelines. The baseline includes the protections of sections 7, 9, and 10 of the ESA, and economic impacts resulting from these protections to the extent that they are expected to occur absent the designation of critical habitat for the species. The baseline also includes protections afforded rockfish from protections in place for other listed species mentioned above. These baseline protections for listed species occur through two sections of the ESA.

- Section 7 of the ESA, absent critical habitat designation, requires Federal agencies to consult with NOAA Fisheries to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species. The portion of the administrative costs of consultations under the jeopardy standard, along with the impacts of project modifications resulting from consideration of this standard, are considered baseline impacts.
- Section 9 defines the actions that are prohibited by the ESA. In particular, it prohibits the "take" of endangered wildlife, where "take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."[13] The economic impacts associated with this section manifest themselves in actions undertaken with respect to ESA sections 7 and 10.

The protection of listed species and habitat is not limited to the ESA. Other Federal agencies, as well as State and local governments, may also seek to protect the natural resources under their jurisdiction. If compliance with the Clean Water Act or State environmental quality laws, for example, protects habitat for the species, such protective efforts are considered to be baseline protections and costs associated with these efforts are not quantified as impacts of critical habitat designation. As noted above, where uncertainty exists as to whether particular costs would have already occurred under the baseline, this analysis conservatively includes those costs.

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[12] For additional information on the definition of "surplus" and an explanation of consumer and producer surplus in the context of regulatory analysis, see: Gramlich, Edward M., A Guide to Benefit-Cost Analysis (2nd Ed.), Prospect Heights, Illinois: Waveland Press, Inc., 1990; and U.S. Environmental Protection Agency, Guidelines for Preparing Economic Analyses, EPA 240-R-00-003, September 2000, available at http://yosemite.epa.gov/ee/epa/eed.nsf/ webpages/Guidelines.html.

[13] 16 U.S.C. 1532.

After the critical habitat rule goes into effect, activities affecting rockfish may require changes to avoid destruction or adverse modification of critical habitat. This analysis aims to understand the economic impacts of avoiding adverse impacts to rockfish critical habitat over and above other baseline protections that may already be in place. Because of the close relationship in terms of management requirements under the ESA between rockfish and listed threatened and endangered salmon and steelhead species, protections for these species are anticipated to provide the strongest baseline protections to rockfish within areas assessed for critical habitat designation. In addition, a number of regulations, laws, and initiatives have been created specifically to address human-induced impacts on other fish species. These are summarized in Appendix B.

Overlap with Existing Critical Habitat for Salmon, Steelhead, and Other Listed Species

Rockfish habitat largely overlaps other listed West Coast salmonid species, green sturgeon, and killer whale habitat as described in Exhibit 2-1. While the habitat area affected by the proposed rule supports numerous other listed species, rockfish is most closely related to salmon species in terms of habitat threats and habitat management requirements.

Since the species' listing in April 2010, within the basins assessed for critical habitat for the rockfish, a total of 67 consultation actions were recorded in NOAA's PCTS database between 2010 and 2011, or approximately 33.5 actions annually[14]. As presented in Exhibit 2-1, this consultation history includes consultations on seven listed species and DPSs, most of which are salmonids. These actions were authorized, funded, or carried out by several Federal agencies in addition to NOAA Fisheries.

[14] Since NOAA Fisheries is proposing critical habitat in a subset of the total area of the five basins, it is likely that some of the 33.5 actions recorded in PCTS occurred in areas that would not be designated as critical habitat (e.g, actions occurring near the Snohomish River delta). Nonetheless, our analysis presumes that 33.5 actions would occur annually and require a critical habitat consultation.

EXHIBIT 2-1. OTHER SPECIES INCLUDED IN SECTION 7 ACTIONS IN AREAS ASSESSED FOR DESIGNATION AS ROCKFISH CRITICAL HABITAT (2001-2010)[15]

SPECIES (ESU/DPS)	STATUS	CRITICAL HABITAT STATUS	CRITICAL HABITAT LOCATION
Eulachon (Southern DPS)	Threatened	Designated*	Not in Puget Sound
Salmon, Chinook (Puget Sound ESU)	Threatened	Designated	Nearshore of each basin in Puget Sound
Salmon, chum (Hood Canal summer-run ESU)	Threatened	Designated	377 miles (607 k) of nearshore marine areas of Hood Canal and the Strait of Juan de Fuca (to Dungeness Bay).
Steelhead (Puget Sound DPS)	Threatened	In Process	Not proposed in marine habitats of Puget Sound
Sturgeon, green (Southern DPS)	Threatened	Designated	Marine waters westward of a line between Partridge Point on Whidbey Island and Point Wilson at Port Townsend.
Whale, killer (Southern Resident DPS)	Endangered	Designated	Waters deeper than 20m in Puget Sound with the exception of Hood Canal.
*Not designated in marine waters. Bull trout consultations are conducted by the U.S. Fish and Wildlife Service separate from species under NOAA Fisheries jurisdiction.			

Other Fish Species

Aside from Puget Sound Chinook salmon, Hood Canal summer-run chum salmon, and bull trout and their designated critical habitat, the analysis also considered baseline protections resulting from the presence of protected fish, including the Southern DPS of eulachon. Critical habitat for eulachon has been designated in riverine and estuarine waters in Washington, Oregon, and California, but does not overlap with proposed rockfish critical habitat. Eulachon do, however, occupy the waters of Puget Sound and thus are considered in section 7 consultations where applicable.

While conservation actions that occur as a result of section 7 consultation for eulachon may not always benefit rockfish, conservation actions for some activities may provide a measure of protection for rockfish habitat.

Marine Mammals

The analysis also considers baseline protections resulting from the presence of marine mammals such as killer whales and Steller sea lions. While conservation recommendations for marine mammals may not always benefit rockfish, conservation recommendations for some activities, particularly those that may affect prey or water quality, may provide a measure of protection for rockfish and its habitat. Because the

[15] Section 7 actions include all completed section 7 consultations categorized as formal, informal, programmatic, conference, implementation, and pre-consultation/technical assistance.

specific habitat requirements for marine mammals and rockfish are less closely related than salmonids and green sturgeon, only some baseline protections for rockfish are assumed to exist as specific habitat requirements between these two species. This approach likely underestimates baseline protections that may exist for rockfish in marine mammal habitat areas.

Overlap with Critical Habitat for Other Listed Species

As shown in Exhibit 1-2, the physical or biological features essential for conservation of rockfish critical habitat are similar to those of other listed salmonids and green sturgeon with existing critical habitat designations as well as other listed species. Exhibit 2-2 summarizes the types of project specifications that have occurred for salmon, steelhead, eulachon, and bull trout habitat in areas assessed for designation as critical habitat for rockfish. These baseline protections would also protect the essential features of proposed rockfish critical habitat. Other actions that focus on fish survival more than habitat (e.g., survey and monitor for presence of the species), have not been included.

EXHIBIT 2-2. TYPICAL BASELINE PROJECT SPECIFICATIONS FOR CONSULTATIONS THAT MAY BE PROTECTIVE OF ROCKFISH HABITAT

ACTIVITY	TYPICAL BASELINE PROJECT SPECIFICATIONS
Nearshore work, Dredging, and Transportation	▪ Dredging to be completed in compliance with applicable State water quality standards. ▪ Water quality monitoring will be conducted during active dredging and other in-water activities. ▪ Project impacts will be confined to the minimum area necessary to complete the project. ▪ Dredge disposal should occur at areas of less benthic habitat complexity. ▪ Disturbed area should be planted with native riparian plants including trees. The plantings should be monitored for three years to ensure establishment. ▪ Develop spill containment and control plan.
	▪ Reduce sheet, rill, and gully erosion at field edges by trapping sediment. ▪ Reduce polluted surface runoff by trapping pollutants. ▪ Implement a pollution and erosion control plan to prevent pollution caused by operations, including practices to prevent erosion and sedimentation associated with related shoreline operations. ▪ Prevent entry of pollutants into waters and ensure that the temperature of receiving waters does not exceed site-specific minimum temperature standards.
Utilities	▪ Utilize directional drilling, rather than open cut construction. ▪ Use sediment barriers to prevent the flow of spoil or heavily silt-laden water into any body of water.
Water Quality	▪ Ensure that all nearshore projects involve a professional fisheries biologist. ▪ Follow guidelines for timing of in-water work, where relevant, except where the potential for greater damage to fish, water quality, and fish habitat exists.
Commercial Fishing (gill net, other)	▪ Ensure lost nets are promptly reported to appropriate authorities. ▪ Use best practices to reduce likelihood of gear loss.
Aquaculture	▪ Implement a pollution and erosion control plan to prevent pollution caused by operations, including practices to prevent erosion and sedimentation associated with related shoreline operations. ▪ Develop spill containment and control plan. ▪ Regularly inspect geoduck culture areas, particularly after large storm events, for loose

ACTIVITY	TYPICAL BASELINE PROJECT SPECIFICATIONS
	nets, tubes, and other aquaculture related equipment. ▪ Shellfish will be hand planted and harvested without mechanical equipment. ▪ A boat landing zone will be identified so that boats do not adversely impact eelgrass beds or other habitat features. ▪ Shellfish bags will be placed in a manner that does not adversely affect substrate conditions or longshore drift. Any noticeable change in either will result in removal or relocation of shellfish bags. ▪ Shellfish bags will be placed a minimum of 25 feet from existing kelp or eelgrass beds. ▪ Inspections will occur at a minimum of every two weeks.
Source: Federal Energy Regulatory Commission, Wetland And Waterbody Construction And Mitigation Procedures, January 17, 2003. NOAA Fisheries, Endangered Species Act Section 7 Formal Informal Consultation for Point Roberts Marina Maintenance Dredging project, Whatcom County, WA, # 2011/00455, February 17, 2011. NOAA Fisheries, Endangered Species Act Section 7 Formal Informal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fishing Habitat Consultation for Proposed Approval of Finfish Rearing Provision Contained in the Sediment Management Standards Rule Promulgated by the Washington State Department of Ecology, # 2010/06071, April 8, 2011. Batched Endangered Species Act Section 7 Informal and Magnuson-Stevens Fishery Management Act Consultations: Taylor Shellfish geoduck farms on the Hitchcock lease, December 19, 2011 (NWS-2010-1238). Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Management Act Essential Fish Habitat Consultation for the SR 520 Bridge Replacement Project (Cedar River, HUC 171100120302), King County, WA, May 20, 2011 (2010/05723). Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Second Explosives Handling Wharf at Naval Base Kitsap Bangor, Kitsap County, Washington (5th field HUC: 17110018, Hood Canal), September 29, 2011 (2011/00658). Endangered Species Act Section 7(a)(2) Consultation Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation on Impacts of Programs Administered by the Bureau of Indian Affairs that Support Puget Sound Tribal Salmon Fisheries, Salmon Fishing Activities Authorized by the U.S. Fish and Wildlife Service, and Fisheries Authorized by the U.S. Fraser Panel in Puget Sound from August 1, 2010 through April 30, 2011, (F/NWR/2010/03521). Endangered Species Act Section 7 Informal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the proposed Puget Sound Recreation Fund - Bloedel Community Shellfish Farm project, Kitsap County Washington (HUC 1711001904, Bainbridge Island), COE No. NWS-2009-228, October 13, 2009, (2009/04449). Endangered Species Act Section 7 Concurrence Letter and Magnuson Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Kondracke pier, ramp, float project, Kitsap County, Washington (Sixth-Field Hydrologic Unit Code 171100190404, Bainbridge Island), March 27, 2012. (2012/00779). Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Midway Sewer District Submarine Outfall in Puget Sound, 17110019 Fourth Field HUC, King County, Washington, April 17, 2006 (2002/00838).	

2.3.2 TYPES OF ECONOMIC IMPACTS OF CRITICAL HABITAT DESIGNATION

The purpose of the analysis is to determine the impacts on land uses and activities from the potential designation of critical habitat that are above and beyond those impacts due to existing or planned conservation efforts being undertaken due to other Federal, State, and local regulations or guidelines.

When critical habitat is designated, section 7 requires Federal agencies to ensure that their actions will not result in the destruction or adverse modification of critical habitat (in addition to ensuring that the actions are not likely to jeopardize the continued existence of the species). The added administrative costs of including consideration of critical habitat

in section 7 consultations and the additional impacts of implementing project modifications to protect critical habitat are the direct result of the designation. These costs are not in the baseline, and are considered incremental impacts of the rulemaking.

Direct Impacts

The direct incremental impacts of critical habitat designation stem from the consideration of the potential for destruction or adverse modification of critical habitat during section 7 consultations. The two categories of direct incremental impacts of critical habitat designation are: 1) the administrative costs of conducting consultation; and 2) implementation of any project modifications requested by NOAA Fisheries through consultation to avoid or minimize potential destruction or adverse modification of critical habitat.

Administrative Section 7 Consultation Costs

Parties involved in section 7 consultations for rockfish include NOAA Fisheries, a Federal action agency (the Federal action, such as a permit or other authorization, provides the "Federal nexus" requiring consultation), and often, a private entity involved in the project or land use activity such as a port or local shoreline landowner. The Federal action agency serves as the liaison with NOAA Fisheries. A critical habitat designation may increase the administrative effort where the project or activity in question may adversely modify critical habitat. Administrative efforts for consultation may therefore result in both baseline and incremental impacts.

In general, three different scenarios associated with the designation of critical habitat may trigger incremental administrative consultation costs:

- **Additional effort to address adverse modification in a new consultation:** New consultations taking place after critical habitat designation may require additional effort to address critical habitat issues above and beyond the listing issues.
- **Re-initiation of consultation to address adverse modification:** Consultations that have already been completed on a project or activity may require re-initiation to address critical habitat. In this case, the costs of re-initiating the consultation, including all associated administrative and project modification costs, are considered incremental impacts of the designation.
- **Incremental consultation resulting entirely from critical habitat designation:** Critical habitat designation may trigger additional consultations that may not occur absent the designation (e.g., for an activity for which adverse modification may be an issue, while jeopardy is not, or consultations resulting from the new information about the potential presence of the species provided by the designation). Such consultations may, for example, be triggered in critical habitat areas that are not occupied by the species during the period when work occurs.

The administrative costs of these consultations vary depending on the specifics of the project. One way to address this variability is to show a range of possible costs of consultation. Section 3.6 discusses estimated consultation costs in more detail.

This analysis forecasts a future rate of section 7 consultations for rockfish, assuming that the average rate per year is unlikely to change from 2010 and 2011 due solely to critical habitat designation for rockfish.

Section 7 Project Modification Impacts

Where critical habitat has been designated, a section 7 consultation may result in terms and conditions for project modifications specifically to avoid destruction or adverse modification. The economic impacts of project changes undertaken to avoid or minimize adverse modification are considered incremental impacts of critical habitat designation.

Indirect Impacts

The designation of critical habitat may affect actions that do not have a Federal nexus and thus are not subject to the provisions of section 7 of the ESA. Indirect impacts are those unintended changes in economic behavior that may occur outside of the ESA, through other Federal, State, local, or private actions that are caused by the designation of critical habitat. This section identifies common types of indirect impacts that may be associated with the designation of critical habitat. Importantly, these types of impacts are not always considered incremental. If these types of conservation efforts and economic effects would occur regardless of critical habitat designation, they are appropriately considered baseline impacts.

Habitat Conservation Plans

Under section 10 of the ESA, non-Federal entities may develop a conservation plan (commonly termed a habitat conservation plan (HCP)) that minimizes and mitigates take in exchange for a permit that authorizes take of the listed species incidental to an otherwise lawful activity. Thus, HCPs are developed to ensure compliance with section 9 of the ESA and must meet the requirements of section 10 of the ESA.

Application for an incidental take permit and completion of an HCP is not required or necessarily recommended by NOAA Fisheries as a result of a critical habitat designation. In certain situations, however, the new information provided by the proposed critical habitat rule may prompt an entity to apply for an incidental take permit. For example, a landowner may have been previously unaware of the potential presence of the species on or near his or her property, and expeditious completion of an HCP may offer the landowner regulatory relief in the form of exclusion from the final critical habitat designation. In this case, the effort involved in creating the HCP and undertaking associated conservation actions is considered an indirect, incremental impact of designation.

Other State and Local Laws

Critical habitat designation may provide new information to a State or local government about the sensitive ecological nature of a specific area, potentially triggering additional

economic impacts under other State or local laws. In cases where these impacts would not have been triggered absent critical habitat designation, they are considered indirect, incremental impacts of the designation.

Additional Indirect Impacts

In addition to the indirect effects noted above, project proponents, land managers, and landowners may face the following indirect incremental impacts of critical habitat designation:

- **Time Delays -** Both public and private entities may experience delays for projects and other activities due to requirements associated with the need to re-initiate the section 7 consultation process and/or to comply with other laws triggered by the designation.
- **Regulatory Uncertainty** - NOAA Fisheries conducts each section 7 consultation on a case-by-case basis and issues a biological opinion on formal consultations based on species-specific and site-specific information. As a result, government agencies and affiliated private parties who consult with NOAA Fisheries under section 7 may face uncertainty concerning whether project modifications will be recommended by NOAA Fisheries and what the nature of these modifications will be. This uncertainty may diminish as consultations are completed and additional information becomes available on the effects of critical habitat on specific activities, or where programmatic consultations are completed.
- **Stigma -** In some cases, the public may perceive that critical habitat designation may result in limitations on private property uses above and beyond those associated with anticipated project modifications or regulatory uncertainty. Public attitudes about the limits or restrictions that critical habitat may impose can cause real economic effects, regardless of whether such limits are actually imposed. All else equal, a property that is adjacent to waters designated as critical habitat may have a lower market value than an identical property that is not within the boundaries of critical habitat due to perceived limitations or restrictions. As the public becomes aware of the true regulatory burden imposed by critical habitat, the impact of the designation on property markets may decrease.

We considered whether these types of potential indirect impacts might occur as a result of designating critical habitat for rockfish, but could not find evidence of their existence. Such impacts are therefore not included in our cost estimates.

2.4 APPROACH TO ANALYSIS OF ROCKFISH CRITICAL HABITAT

To quantify the economic impacts of modifications to land and water uses likely to result from critical habitat designation, the analysis employs the following three steps:

1. Define the geographic study area for the analysis, and identify the units, in this case, the five biogeographic basins within the study area to be analyzed for

purposes of this designation. The proposed rule to designate critical habitat analyzes how specific areas in each basin meet the definition of critical habitat set forth in section 3 of the ESA.

2. Based on the potentially affected economic activities identified by NOAA Fisheries, determine how conservation efforts, including both project modification and administrative costs, may increase due to the designation of critical habitat for rockfish.
3. Estimate the economic impacts associated with this change in management.

These steps are described in greater detail below.

2.4.1 DEFINE GEOGRAPHIC STUDY AREA

As shown in Exhibit 1-1, the critical habitat study area includes each of the major basins of the Puget Sound, including their immediately adjacent watersheds.

2.4.2 IDENTIFY POTENTIALLY AFFECTED ECONOMIC ACTIVITIES AND DETERMINE HOW MANAGEMENT MAY CHANGE

Using the two-year consultation history for each of the five basins, this analysis identifies economic activities that may be subject to section 7 consultation, forecasts a future rate of section 7 consultation for rockfish, and estimates associated administrative costs and potential project modification costs, where relevant.

2.4.3 ESTIMATE ASSOCIATED ECONOMIC IMPACTS

A key challenge of this analysis is determining the extent to which the presence of rockfish and its critical habitat affect the type or level of project modifications required by NOAA Fisheries for a project or activity. The uncertainty at this stage of the analysis falls into two main categories:

1. Identifying project modifications that are likely to occur to avoid adverse modification of critical habitat, beyond those already occurring, to avoid jeopardizing the continued existence of the *rockfish species*. NOAA Fisheries has a history of consultation on actions affecting rockfish where the actions have been modified to avoid jeopardizing the continued existence of the species. It is uncertain whether NOAA Fisheries would recommend additional project modifications to avoid adversely modifying critical habitat.
2. Identifying project modifications that are likely to occur to avoid adverse modification of rockfish critical habitat, beyond those already occurring, to avoid jeopardy to other species or adverse modification of the critical habitat of *other listed species*. As noted previously, most of the areas assessed for rockfish critical habitat overlap significantly with the occurrence of other listed species and their critical habitat. NOAA Fisheries has a history of consultation on actions affecting these other species and their critical habitats, where the actions have been modified to avoid jeopardizing the continued existence of the species or adversely modifying their critical habitats. In areas of overlap with other species or their critical habitats, it is uncertain whether NOAA Fisheries would

recommend additional project modifications to avoid adversely modifying critical habitat of rockfish.

With regard to the first category of uncertainty, it is difficult to separate potential project modifications expected to result from critical habitat from those that would already be expected to occur for rockfish due to listing of the species. This analysis focuses on project modifications specifically identified in discussions with NOAA Fisheries biologists and other stakeholders as associated with preventing adverse modification of rockfish habitat.

Regarding the second category of uncertainty, a number of rockfish habitat areas overlap areas where other fish species occur or where their designated critical habitat occurs, particularly green sturgeon, salmonids, and killer whales. Based on the existing history of formal consultations in areas assessed as rockfish critical habitat, it appears that project modifications that would benefit rockfish are most frequently associated with the presence of salmonid species. Most projects that require section 7 consultations originate in the nearshore, thus salmonid species and their associated critical habitats may therefore provide a strong baseline protection for rockfish critical habitat where habitats coexist. This analysis assumes that, for most projects in salmonid critical habitat, the majority of project modifications benefitting rockfish would be undertaken regardless of the presence of rockfish or its critical habitat.

In general, this analysis examines conservation measures likely to occur for rockfish critical habitat over and above those for presence of rockfish and other fish species and their critical habitat.

In some cases, rockfish critical habitat may be a key reason for implementing a project modification. This may be true, for example, where few other sensitive species are present such as deepwater areas of the Puget Sound that are not designated as critical habitat for salmon. The analysis assumes that when other listed species and their critical habitat are absent; rockfish are the key drivers of conservation measures. As noted above, the probability that any given project modification is being driven by rockfish critical habitat designation as opposed to other species is uncertain.

2.4.4 ANALYTIC TIME FRAME

The analysis estimates impacts based on activities that are reasonably foreseeable, including activities that are currently authorized, permitted, or funded, or for which proposed plans are currently available to the public. This analysis estimates the average annual number of consultations anticipated over the next 20 years.

2.4.5 TREATMENT OF UNCERTAINTIES

Many uncertainties exist with regard to potential economic impacts of critical habitat designation for rockfish, stemming from a number of factors, which are summarized in Exhibit 2-3. In summary, because of uncertainty concerning future actions likely to be undertaken specifically to avoid destroying or adversely modifying rockfish critical habitat, this analysis qualitatively discusses potential impacts to specific projects highlighted by NOAA Fisheries.

EXHIBIT 2-3. KEY SOURCES OF UNCERTAINTY

UNCERTAINTY	ANALYTIC SOLUTION
Project modifications for rockfish critical habitat designation are less certain relative to other listed species. • NOAA Fisheries has limited experience in managing rockfish under the ESA, and there is general uncertainty about specific management actions likely to be undertaken on behalf of these species. Because the species were listed relatively recently, there have been only a limited number of consultations on the species.	The analysis includes a discussion about what is known about past recommendations that NOAA Fisheries has made for rockfish or other species inhabiting the same habitat for each potentially affected economic activity. The analysis also discusses specific project modifications intended to avoid adversely modifying rockfish critical habitat, as suggested by NOAA Fisheries biologists and other stakeholders familiar with the projects.
Separating baseline impacts from incremental impacts due to critical habitat designation is difficult. • One of the tasks for this analysis is separating project modifications that would have been undertaken without rockfish critical habitat from those that are taken only because of critical habitat designation.	The analysis provides a qualitative discussion of the high level of baseline protections existing in basins assessed for critical habitat (see Appendix B). It then focuses on project modifications highlighted by NOAA Fisheries as protective of rockfish and its habitat over and above those recommended for other fish species.

2.5 PRESENTATION OF RESULTS

Impacts are described in present value and annualized terms applying discount rates of seven percent throughout the body of the report. Additionally, Appendix B provides the present and annualized value of impacts in each unit applying a three percent discount rate for comparison with values calculated at seven percent.[16] Appendix C presents undiscounted annual impact values by activity and subunit. Present value and annualized impacts are calculated according to the methods described in Exhibit 2-4.

[16] The OMB requires Federal agencies to report results using discount rates of three and seven percent (see OMB, Circular A-4, 2003).

EXHIBIT 2-4. CALCULATING PRESENT VALUE AND ANNUALIZED IMPACTS

CALCULATING PRESENT VALUE AND ANNUALIZED IMPACTS

This analysis compares economic impacts incurred in different time periods in present value terms. The present value represents the value of a payment or stream of payments in common dollar terms. That is, it is the sum of a series of future cash flows expressed in today's dollars. Translation of economic impacts of future costs to present value terms requires the following: a) projected future costs of critical habitat designation; and b) the specific years in which these impacts are expected to be incurred. With these data, the present value of the past or future stream of impacts (PV_c) from year t to T is measured in 2010 dollars according to the following standard formula:[a]

$$PV_c = \sum_{t}^{T} \frac{C_t}{(1+r)^{t-2009}}$$

C_t = cost of critical habitat project modifications in year t

r = discount rate[b]

Impacts for each activity in each unit are also expressed as annualized values. Annualized values are calculated to provide comparison of impacts across activities with varying forecast periods (T). For this analysis, however, all activities employ a forecast period of 20 years, 2011 through 2030. Annualized future impacts (APV_c) are calculated by the following standard formula:

$$APV_c = PV_c \left[\frac{r}{1-(1+r)^{-(N)}} \right]$$

N = number of years in the forecast period (in this analysis, 20 years)

[a] To derive the present value of future impacts, t is 2011 and T is 2030.

[b] The goal in selecting the appropriate discount rate is to choose the rate which individuals, and society, are willing to exchange consumption spending over time. OMB's own guidance on discounting currently recommends using a rate of seven percent, an estimate of the average real pre-tax rate of return generated by private sector investments. Since public use of capital relies on private capital markets, and since government use of investment funding may use funds that would otherwise be available for private borrowing, the market equilibrium interest rate can be used as a discounting rate to apply to public sector investments and/or discounting. This is the logic behind OMB's recommendation of a seven percent discount rate. OMB also recommends the use of an alternate discount rate for comparison, often three percent. Based on historical rates of return on relatively risk-free investments (such as U.S Treasury securities), adjusted for taxes and inflation, a consumption rate of interest measured at two to three percent is justified. Presenting discounted values with both a low and a high discount rate performs a degree of sensitivity analysis for the findings of a particular valuation.

Sources: U.S. Office of Management and Budget, Circular A-4, September 17, 2003 and U.S. Office of Management and Budget, "Draft 2003 Report to Congress on the Costs and Benefits of Federal Regulations; Notice," 68 *Federal Register* 5492, February 3, 2003; U.S. Environmental Protection Agency, Guidelines for Preparing Economic Analyses, September 2000.

SECTION 3 | INCREMENTAL IMPACTS

3.1 INTRODUCTION

As discussed in Section 2, this analysis examines the potential impacts of restricting or modifying specific land and water uses or activities to avoid adverse modification or destruction of critical habitat for rockfish. This section presents estimates of the incremental economic impacts of designating areas assessed for critical habitat for rockfish over and above existing baseline protections related to existing ESA regulations in place for all listed species. As discussed in greater detail in Section 2 and Appendix B, protections under the ESA for other listed species are expected to offer a high level of baseline protection for rockfish in areas assessed for critical habitat.

3.2 SUMMARY OF FINDINGS

Additional administrative costs related to the consideration of rockfish critical habitat in future section 7 consultations are expected. However, because each biogeographic basin assessed for critical habitat for rockfish are occupied by listed rockfish, and most also overlap critical habitat for other listed species, incremental project modifications for rockfish critical habitat are considered to be unlikely for most areas.[17] The analysis anticipates that incremental impacts will be limited to administrative costs related to considering adverse modification of critical habitat in section 7 consultation. In total, incremental costs of critical habitat are estimated to be $123,000, annualized at a discount rate of seven percent (see Exhibit 3-1). As shown in Exhibit 3-2, the highest estimated costs anticipated to be associated with the administrative burden of section 7 consultations concern transportation and nearshore work, followed by water quality, utilities, and other activities. The San Juan/Strait of Juan de Fuca Basin has the largest estimated impacts, associated with consultations on transportation activities and nearshore work. As discussed in detail in this section and summarized below, although this analysis anticipates administrative costs in each basin, we find that incremental project modification costs are unlikely to occur.

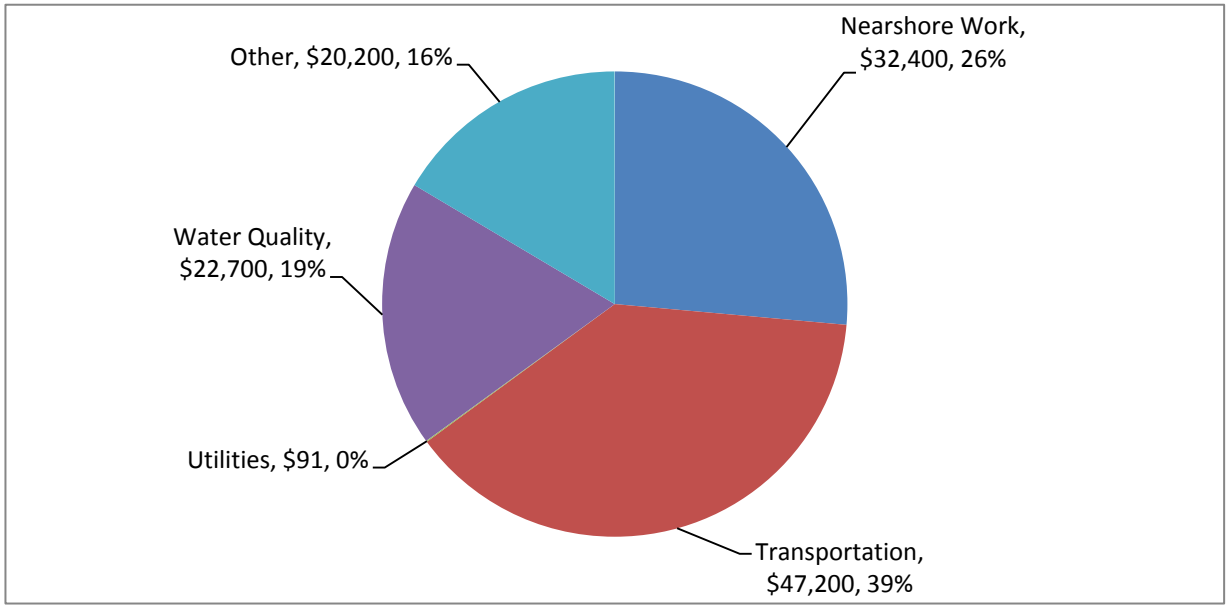
[17] The only areas proposed that are not currently designated as critical habitat are the open water (i.e., not nearshore) areas within Hood Canal.

EXHIBIT 3-1. SUMMARY OF ANNUAL INCREMENTAL COSTS*, BY BASIN.

NAME	PRESENT VALUE (SEVEN PERCENT)	PRESENT VALUE (THREE PERCENT)	ANNUALIZED (SEVEN PERCENT)	ANNUALIZED (THREE PERCENT)
San Juan/Straits of Juan de Fuca Basin	$364,000	$492,000	$32,100	$32,100
Whidbey Basin	$341,000	$461,000	$30,100	$30,100
Main Basin	$329,000	$444,000	$29,000	$29,000
Hood Canal	$116,000	$156,000	$10,200	$10,200
South Puget Sound	$240,000	$325,000	$21,200	$21,200
Total	**$1,390,000**	**$1,880,000**	**$123,000**	**$123,000**

Note: Totals may not sum due to rounding. Discounted at a seven percent discount rate.
*Incremental costs are administrative.

EXHIBIT 3-2. SUMMARY OF ANNUAL INCREMENTAL COSTS* BY ACTIVITY (PRESENT VALUE, DISCOUNTED AT SEVEN PERCENT).



*Incremental costs are administrative.

3.3 ESTIMATED ADMINISTRATIVE IMPACTS

When critical habitat is designated, section 7(a)(2) of the ESA requires Federal agencies to ensure that their actions will not result in the destruction or adverse modification of critical habitat (in addition to ensuring that the actions are not likely to jeopardize the continued existence of the species). The added administrative costs of including consideration of critical habitat in section 7 consultations and the additional impacts of implementing project modifications to protect it are the direct result of the designation. These costs are not in the baseline, and are considered incremental impacts of the rulemaking.

This section describes projected future administrative costs of engaging in section 7 consultation activities that consider rockfish and their critical habitat. Forecast consultations are also categorized by the type of consultation (e.g., informal versus formal) and assigned to the various economic activities identified by NOAA Fisheries.

3.3.1. THE CONSULTATION PROCESS

As discussed in detail in Section 2.1 of this report, section 7(A)(2) of the ESA requires Federal agencies (action agencies) to consult with NOAA Fisheries whenever activities that they undertake, authorize, permit, or fund may affect a listed species or designated critical habitat. Formal or informal consultation occurs depending upon the effect the Federal action has upon a listed species or its designated critical habitat. Regardless of the type of consultation, section 7 consultations can require substantial administrative effort on the part of all participants depending on the complexity of the particular Federal action and the potential effects to listed species and/or critical habitat.

3.3.2. ADMINISTRATIVE SECTION 7 CONSULTATION COSTS

Critical habitat designation may increase the level of consultation effort in cases where a project or activity may also adversely modify critical habitat. Consultations considering rockfish may therefore have both baseline and incremental impacts. In general, three different scenarios associated with the designation of critical habitat may trigger incremental administrative consultation costs:

1. **Additional effort to address adverse modification in a new consultation:** New consultations taking place after critical habitat designation may require additional effort to address issues above and beyond the requirements of listing.
2. **Re-initiation of consultation to address adverse modification:** Consultations that have been completed on a project or activity may require re-initiation to address the requirements of critical habitat.
3. **Incremental consultation resulting entirely from critical habitat designation:** Critical habitat designation may trigger additional consultations that would not occur absent the designation (e.g., for an activity for which adverse modification may be an issue, while jeopardy is not, or consultations resulting from the new information about the potential presence of the species provided by the designation). Such consultations

may, for example, be triggered in critical habitat areas that are not occupied by the species.

The administrative cost estimates presented in this section take into consideration the level of effort of NOAA Fisheries and the Federal action agency, as well as the varying complexity of the consultation. These estimates, presented in Exhibit 3-3, are based on a survey conducted by NOAA Fisheries as part of the 2005 salmon and steelhead critical habitat re-designations. Generally, programmatic and formal consultations are more costly than informal consultations and technical assistance, and the cost of consultation to consider jeopardy is higher than the incremental costs of addressing adverse modification to habitat. The greatest administrative costs are associated with programmatic consultations for water quality projects. Consultations related to transportation projects are also relatively high compared to other types of projects.

To estimate the fractions of the total administrative consultation costs that are baseline and incremental, the following assumptions were applied:

- Costs associated with an incremental consultation (one occurring because of the designation of critical habitat) would be attributed wholly to critical habitat;
- Efficiencies exist when considering both jeopardy and adverse modification at the same time (e.g., in staff time saved for project review and report writing). As shown in Exhibit 3-3, this analysis assumes that the additional effort to address adverse modification of habitat is equivalent to one third of the effort to address the presence of the species alone. That is, for every three hours spent considering a jeopardy analysis for rockfish, an additional hour would be needed to consider rockfish critical habitat. This is based on estimates of additional U.S. Fish and Wildlife Service effort for bull trout consultations in the Northwest, and which was considered relevant to the current critical habitat designation.

EXHIBIT 3-3. ADMINISTRATIVE CONSULTATION COSTS PER EFFORT (2011 DOLLARS)

ACTIVITY	FORMAL			PROGRAMMATIC			INFORMAL			TECH. ASSIST
	NOAA	ACTION AGENCY	TOTAL	NOAA	ACTION AGENCY	TOTAL	NOAA	ACTION AGENCY	TOTAL	TOTAL
Consultation Considering Jeopardy (Does Not Include Consideration of Adverse Modification)										
Hydro-Power	$44,300	$6,300	**$50,600**	$44,300	$2,200,000	**$2,240,000**	$693	$16,600	**$17,300**	**$693**
Water Quality	$45,700	$6,300	**$52,000**	$45,700	$2,200,000	**$2,250,000**	$4,850	$16,600	**$21,400**	**$4,160**
Federal Lands Management	$20,800	$3,800	**$24,600**	$20,800	$20,500	**$41,300**	$4,160	$1,800	**$5,960**	**$12,500**
Development	$11,100	$25,600	**$36,700**	$11,100	$70,500	**$81,600**	$1,660	$2,800	**$4,460**	**$277**
Nearshore Work	$3,600	$3,700	**$7,300**	$3,600	$12,200	**$15,800**	$2,460	$2,800	**$5,260**	**$13,200**
Mining	$63,700	$82,100	**$146,000**	$63,700	$240,000	**$304,000**	$1,390	$2,800	**$4,190**	**$1,390**
Transportation	$8,310	$20,200	**$28,500**	$8,310	$34,900	**$43,200**	$5,960	$16,300	**$22,300**	**$5,820**
Utilities	$13,200	$12,200	**$25,400**	$13,200	$30,300	**$43,500**	$4,430	$2,800	**$7,230**	**$277**
Commercial Fishing and Other	$5,540	$4,600	**$10,100**	$5,540	$0	**$5,540**	$2,770	$2,300	**$5,070**	**$5,540**
Additional Effort to Address Adverse Modification in a New Consultation										
Hydropower	$14,800	$2,100	**$16,900**	$14,800	$733,000	**$747,000**	$231	$5,530	**$5,770**	**$231**
Water Quality	$15,200	$2,100	**$17,300**	$15,200	$733,000	**$750,000**	$1,620	$5,530	**$7,130**	**$1,390**
Federal Lands Management	$6,930	$1,270	**$8,200**	$6,930	$6,830	**$13,800**	$1,390	$600	**$1,990**	**$4,170**
Development	$3,690	$8,530	**$12,200**	$3,690	$23,500	**$27,200**	$554	$933	**$1,490**	**$92**
Nearshore Work	$1,200	$1,230	**$2,430**	$1,200	$4,070	**$5,270**	$821	$933	**$1,750**	**$4,400**
Mining	$21,200	$27,400	**$48,700**	$21,200	$80,000	**$101,000**	$462	$933	**$1,400**	**$463**
Transportation	$2,770	$6,730	**$9,500**	$2,770	$11,600	**$14,400**	$1,990	$5,430	**$7,430**	**$1,940**
Utilities	$4,390	$4,070	**$8,470**	$4,390	$10,100	**$14,500**	$1,480	$933	**$2,410**	**$92**
Commercial Fishing and Other	$1,850	$1,530	**$3,370**	$1,850	$0	**$1,850**	$924	$767	**$1,690**	**$1,850**

Sources: Median cost estimates resulting from interviews with NOAA Fisheries and other Federal and State agency personnel conducted for NOAA Fisheries, Final Economic Analysis of Critical Habitat Designation for 12 West Coast Salmon and Steelhead DPSs, Seattle, WA, August 2005; Estimates of additional administrative effort for critical habitat for bull trout, U.S. Fish and Wildlife Service, Region 1, October 14, 2009.

3.3.3. METHODOLOGY

This section presents the methodology used to: (1) estimate the number of future consultations; (2) classify these consultations by economic activity; (3) assign each consultation to a basin; and (4) calculate anticipated baseline and incremental impacts.

- **Step 1: Classify Consultations by Economic Activity.** NOAA Fisheries identifies the specific economic activities covered by each consultation. This analysis aggregated these specific activities into general activity groups: water quality, nearshore work, transportation, utilities, and other activities. For example, consultations that NOAA Fisheries identified with the activities "waterway–dredging" and "waterway–boat/dock/pier" would be classified as nearshore construction.

  A small number of consultations affect more than one activity. For example, a bridge project that requires pile-driving in a nearshore environment may fall within both the transportation and nearshore construction categories. Because the administrative effort needed may be lower or higher depending on the type of activity considered, this analysis divides consultations across multiple categories as needed. The bridge project example above would, therefore, be counted as half transportation and half nearshore construction.

- **Step 2: Assign Consultations by Critical Habitat Unit.** For formal, informal, programmatic, technical assistance, and implementation consultations, NOAA Fisheries provided consultation history by HUC—either fourth-, fifth-, or sixth-field HUCs in each of the five basins of Puget Sound. However, some consultations may cover activities taking place over multiple HUCs (e.g., a programmatic regional general permit from USACE). Because these consultations cannot be assigned to a specific area, this analysis uniformly distributes them across all HUCs included in the consultation that overlap areas considered for critical habitat. When HUCs overlap multiple basins, the analysis splits the consultations equally across basins.

- **Step 3: Estimate Future Consultations.** This analysis assumes that, for rockfish, the frequency of consultation and the activities considered will be the same as this consultation history on a per basin basis. That is, it assumes that rockfish consultations in a particular basin will occur at the average rate of consultation in that watershed since the rockfish were listed in 2010.

- **Step 4: Calculate Anticipated Incremental Costs.** Because all areas considered for critical habitat are occupied by the species, incremental costs associated with the additional effort needed to address potential adverse modification of habitat for rockfish are limited in most areas. The analysis assumes that the administrative effort to address jeopardy forms part of the baseline effort to consider other NOAA Fisheries-listed species present in these basins. As a result, the only incremental administrative effort in most basins is to address potential adverse modification.

3.4 INCREMENTAL PROJECT MODIFICATION COSTS

Incremental project modification costs are incurred when project modifications are required explicitly for the protection of newly-designated critical habitat. Incremental costs due to critical habitat designation would be expected under two scenarios. In scenario 1, the area identified as critical habitat has not previously been designated as such for any other species (such as portions of Hood Canal). Thus, all newly required consultations that result in project modifications would be considered an incremental impact of the designation. In scenario 2, the area has been designated as critical habitat for other ESA-listed species, but the specific habitat requirements for the newly-listed species are unique and these requirements necessitate project modifications beyond what is required to protect the critical habitat for other relevant ESA-listed species. This section identifies and estimates the costs associated with the activities that are likely to result in additional project costs due to one or both of these scenarios.

3.4.1 PROJECT EVALUATION

To calculate the incremental project modification costs of designating critical habitat for rockfish, we reviewed information provided by NOAA Fisheries that identifies:

- those project types that may adversely impact rockfish habitat; and
- the extent to which appropriate changes are already being implemented as a result of other critical habitat designations or the ESA listing of rockfish or other species.

For project types that may adversely affect rockfish habitat, we asked NOAA Fisheries to consider:

- whether the project type had any Federal involvement and would be subject to a section 7 consultation;
- whether NOAA could identify changes it might seek in a specific project to protect rockfish critical habitat;
- whether such changes would be made because of critical habitat designations for other species, or because of the listing of rockfish or other species.

If a project type had no Federal nexus, or NOAA could identify no changes, or any changes would be made for other reasons regardless of the designation of rockfish critical habitat, we removed it from further consideration. Exhibit 3-4 displays the results of this inquiry. For those projects not removed from consideration, we proceeded with the analysis described in the next section.

EXHIBIT 3-4. ECONOMIC ACTIVITIES CONSIDERED AND DISMISSED FROM FURTHER ANALYSIS

ACTIVITY	POTENTIAL CONCERN	REASON FOR DISMISSAL
New/Rebuilt Piers, Docks, and Floats	Shading of kelp and eelgrass.	Modifications already requested due to salmon CH designation and rockfish listing.
New/Rebuilt Shoreline Armoring (i.e., Bulkheads)	Use of toxic materials, shading, disturbance, or destruction of habitat.	Modifications already requested as part of salmon consultations.
Shoreline Restoration Projects	Disturbance or destruction of habitat.	Modification already requested as part of salmon consultations.
New/Expanded Marinas/Pier Construction (including proposal for coal export facility in Bellingham, WA)	Disturbance and shading of bottom substrate/habitat.	Consultations would place a higher priority on avoiding or mitigating impacts to natural rock or kelp habitats, but would not appreciably increase requirements above what is required for salmon critical habitat consultations.
Dredging	Disturbance of bottom substrate/habitat.	Dredging projects primarily occur in areas of the nearshore with unconsolidated sediment that do not support kelp (i.e., are not optimal rockfish habitat).
Dredge Disposal	Disposal of dredge materials over rockfish habitat.	No new modifications required due to rockfish species listing for current disposal locations. No new disposal locations currently planned.
Pollution Standards (e.g., NPDES, discharge permits, sewage treatment standards, etc.)	Discharge of bioaccumulative toxins.	Modification already requested as part of salmon and killer whale consultations.
Oil Spill Response	Oiling of sensitive habitat (e.g., kelp beds).	Protection of kelp habitats may be prioritized for clean-up due to rockfish CH designation, but this type of consultation is rare.
Tidal and Wave Energy Projects	Disturbance of bottom substrate/habitat.	No potential impacts anticipated explicitly for rockfish habitat that would not already be asked for under species listing.
Rec & Commercial Kelp Harvest	Reduction in suitable kelp habitat due to kelp removal.	Commercial harvest prohibited and recreational harvest sufficiently limited. Expansion of harvest may result in potential adverse modification of habitat, but no Federal nexus for consultation identified.
Research Trawls (WDFW & UW and others)	Disturbance/destruction of high-profile habitat.	Low rockfish catch indicates trawl activity located away from primary rockfish habitat.
Shrimp Trawl	Disturbance/destruction of high-profile habitat. Bycatch of rockfish and prey species.	No Federal nexus for this fishery in Puget Sound. This fishery has ESA section 10 ITP coverage. A proposed rockfish conservation plan was released in March 2012 (WDFW 2012) and finalized in October 2012.
Forage Fish Fisheries (fish that rockfish eat)	Reduction in available prey for rockfish.	Forage fish fisheries (i.e., Pacific herring and smelt) in the Puget Sound are relatively small. Additionally, rockfish diet is diverse.
Salmon Culture	Placement of pens above rockfish rearing habitat, nutrient loading, or near kelp beds.	Potential future placement of salmon culture facilities and materials anticipated to be site specific and the nature and magnitude of potential project modifications are highly uncertain.
Geoduck/Other Bivalve Culture & Harvest	Disturbance of substrate for harvest and culture activities.	Shellfish culture and harvest typically occurs on mudflats from which kelp is absent, and other structure used by rockfish generally lacking in the immediate area of activities.

A variety of additional activities do have the potential to be affected by designation of critical habitat for rockfish. Consultations on rockfish and its critical habitat on the following activities may result in incremental project modification costs.

Fisheries Management – Gillnet Fisheries and Derelict Gear Removal

The majority of fishing nets lost in Puget Sound are monofilament gillnets used in the salmon fishery. These lost nets are not biodegradable and thus, can have lasting effects on marine wildlife and habitats. In addition to "ghost fishing," which results in the capture of a variety of species, these nets can damage marine habitats by trapping fine sediments out of the water column. This creates a layer of soft sediment over rocky areas, changing habitat quality and suitability for rockfish. Nets can also cover habitats used by rockfish for shelter and pursuit of food, rendering the habitat unavailable.[18] The Northwest Straits Initiative estimates that fewer than 1,000 derelict nets remain in waters of Puget Sound shallower than 105 feet, owing largely to efforts to identify and remove nets from these waters. However, an unknown, and perhaps significant, number of nets remain in deeper waters, and some nets continue to be lost as a result of fishing operations.

Through the Puget Sound Chinook Salmon Resource Management Plan submitted to NOAA as part of section 4(d) of the ESA, NOAA has the opportunity to work with the State of Washington and tribal co-managers to ensure that the operation of this fishery does not jeopardize the existence of Puget Sound rockfish or adversely affect their critical habitat.[19] As a result of previous consultations, NOAA has required enhanced reporting, tracking, and prevention of lost nets to protect rockfish and their habitat, all of which are considered baseline impacts in the present analysis. NOAA notes that future consultations may request additional restrictions to prevent net loss and ensure rapid response to remove newly lost nets.[20] However, these future project modifications and associated consultations would be considered baseline impacts, as they are likely to occur due to the listing of the species.

Activities aimed at removing derelict gear can also affect rockfish and their habitat. Projects such as those carried out by the Northwest Straits Initiative may require consultation. However, as these actions are designed for the benefit and conservation of the species, NOAA Fisheries may be unlikely to seek project modifications to protect rockfish critical habitat and therefore there are unlikely to be incremental costs associated with such activities.

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[18] Northwest Straits Initiative at http://www.derelictgear.org/Impact.aspx,

Good, T.P., June, J.A, Etnier, M. A, and G. Broadhurst. 2010. Derelict fishing nets in Puget Sound and the Northwest Straits: Patterns and threats to marine fauna. Marine Pollution Bulletin 60 (2010) 39-50.

[19] The Chinook salmon Resource Management Plan specified the management of commercial, recreational, subsistence, and tribal salmon fisheries as potentially affecting listed PS Chinook salmon from May 1, 2011 through April 30, 2014, [consultation number F/NWR/2010/06051].

[20] Written communication with NOAA Fisheries on August 19, 2011.

Nutrient Input

Through several avenues, including the Clean Water Act, NOAA has the opportunity to consult on projects that will result in the discharge of nutrients into Puget Sound to ensure they do not adversely affect rockfish and their habitat.

For the National Pollution Discharge Elimination System (NPDES) in particular, Washington State retains primacy over permitting actions. Therefore, NPDES permitting requirements do not represent a Federal nexus for section 7 consultation unless the NPDES-permitted facility is federally owned. However, NOAA has already completed one NPDES wastewater discharge permit consultation at a U.S. Military facility relative to rockfish listing, so it is likely that consultations of this type will occur in the future. Nevertheless, significant uncertainty surrounds the type and magnitude of project modifications, if any, associated with consultations on wastewater discharge permitting activities. Therefore, this analysis does not attempt to quantify project modification impacts for these activities.

Submarine Cable Installation or Repair

The installation of submarine cables, including those used to anchor tidal energy projects, have the potential to modify or destroy critical rockfish habitat. Through the Rivers and Harbors Act and the Clean Water Act, NOAA has the opportunity to consult on these types of projects to ensure that no adverse modification of habitat or jeopardy to ESA listed species occurs. However, to date NOAA has not consulted on submarine cable installation projects related to rockfish. Potential project modifications requested by NOAA due specifically to rockfish critical habitat designation might include requirements for cables to be buried, or to avoid areas of higher benthic habitat complexity. Although NOAA already consults on these projects relative to salmon critical habitat, it is possible that NOAA may propose requirements above and beyond those that are already requested to protect salmon critical habitat. This is because some cable installation projects may occur in waters outside of salmonid critical habitat (deeper than 30 meters) in proposed deepwater rockfish critical habitat. Project modifications may include avoiding placement of cables on rockfish habitat, which could result in incremental costs of installation and materials. However, the requirements are anticipated to be site specific. As such, we are unable to predict the likelihood or magnitude of project modifications related to cable installation.

Prevention and Removal of Non-Indigenous Species

Non-indigenous species, including brown algae (*Sargassum muiticum*) and tunicates (e.g., *Ciona savignyi*), may represent a threat to the biotic habitat upon which rockfish depend. Although impacts of these species on rockfish habitat in Puget Sound is not yet well-understood, results in other regions indicate the potential for non-native invertebrates such as tunicates to substantially impact rock-reef fish populations.[21]

[21] 75 FR 22276.

According to NOAA Fisheries, restoration projects to remove or control invasive tunicates, particularly in Hood Canal, are the types of projects most likely to occur in the future that may be subject to impact of the rockfish critical habitat designation. However, NOAA has not carried out consultations on this type of non-indigenous species removal to date. Project modifications are likely to be site-specific in nature. Therefore, the analysis does not attempt to forecast the likelihood or magnitude of incremental costs associated with project modifications.

Artificial Reefs

Artificial reefs may be deployed for several purposes including providing high profile habitat around which fish may aggregate, and to enhance recreational diving opportunities. Construction of artificial reefs could adversely affect rockfish critical habitat if the project is deployed on or near sensitive habitat like kelp beds, or if it uses materials with the potential to release contaminants into the water.

To construct or replace an existing artificial reef requires permits from a number of Federal and State agencies. NOAA's authority to consult on artificial reef deployment projects comes via the Clean Water Act, Rivers and Harbors Act, and NOAA Section 6 Restoration Funds. To specifically address concerns related to adverse impacts on rockfish critical habitat, NOAA may request limitations or revisions to the size and location of a project to avoid sensitive areas such as kelp beds. They may further request changes to the types of materials proposed for use to prevent the leaching of toxic substances into the water. Finally, NOAA may request that a long-term monitoring plan be established to ensure that the project does not begin to adversely affect critical habitat over time.

According to NOAA Fisheries, artificial reef projects are rare in Puget Sound. Although the Washington Department of Fish and Wildlife implemented a formal artificial reef program in 1975, construction of artificial reefs was largely discontinued in 2000 due to the high cost of the program.[22] The Washington State Rockfish Conservation Plan has a policy goal of developing artificial reefs where natural habitats have been degraded. An example of degraded habitats would include existing reefs made of tires.[23] There is considerable uncertainty regarding the role of artificial reefs for rockfish recovery, and whether any such projects would be implemented over the next 20 years. For the reasons described in this section, we do not anticipate incremental project modifications associated with this project type.

3.5 TOTAL INCREMENTAL COSTS

The total annual number of section 7 actions forecast is shown by basin and by activity in Exhibit 3-5. We anticipate a total of just over 30 section 7 consultations annually

[22] Letter from Peter Goldmark, Department of Natural Resources, accessed at http://nwdivers.me/blog/?p=627 on February 28, 2012.

[23] Washington Department of Fish and Wildlife, "Conservation Plan for ESA Listed Species of Rockfish in Puget Sound: Reducing the Impact of Fisheries and Research Activities on Yelloweye, Canary, and Boccaccio Rockfish." March 2012. Accessed at http://wdfw.wa.gov/publications/00035/apr2011_rockfish_conservation_plan.pdf

regarding areas considered for critical habitat. The majority (more than 65 percent) of these consultations are expected to be informal. We expect the greatest number of consultations (8) will occur in the Main Basin. The largest share of consultations by activity belongs to nearshore work projects, with 15.5 consultations forecast per year, followed by transportation-related activities and other activities with 6.5 and 8 consultations per year, respectively. The largest share of annual costs, however, belongs to transportation-related activities at $47,200, as the per consultation incremental costs ($9,500 for formal consultations) for this activity type are relatively higher. In addition, the majority of nearshore work is expected to result in informal consultations, which are less costly. Annual costs associated with nearshore work amount to $32,400, followed by water quality at $22,700, and other activities, including commercial fishing, at $20,200.

EXHIBIT 3-5. FORECAST ANNUAL NUMBER AND COSTS OF FUTURE SECTION 7 ACTIONS BY BASIN AND ACTIVITY[24]

BASIN	NEARSHORE WORK	TRANSPORTATION	UTILITIES	WATER QUALITY	OTHER[1]	TOTAL
San Juan/Strait of Juan de Fuca	4.2	1.9	0.0	0.5	1.2	7.7
Whidbey Basin	2.9	2.4	0.3	0.2	2.1	7.8
Main Basin	3.9	0.9	0.8	1.0	2.3	8.7
Hood Canal	2.3	0.1	0.0	0.2	1.3	3.9
South Puget Sound	2.2	1.4	0.0	0.7	1.2	5.4
Total Annual Consultations	**15.5**	**6.5**	**1.0**	**2.5**	**8.0**	**33.5**
Total Annual Costs	**$32,400**	**$47,200**	**$91**	**$22,700**	**$20,200**	**$123,000**

Notes:
1. The activity category "Other" includes projects related to military activities, research, restoration, commercial fishing, and aquaculture activities.
2. Each section 7 action forecast receives costs associated with its consultation type (e.g., formal, informal, programmatic, or technical assistance) and activity. Estimates are based on the average number of past consultations for the rockfish in these watersheds over the last two years (i.e., 2010-2011).
3. Totals may not sum due to rounding.

As calculated using the steps outlined above**,** annual estimated incremental administrative impacts are summarized in Exhibit 3-6 by consultation type. For example, the first row of Exhibit 3-6 shows the forecasted annual consultations for San Juan/Strait of Juan de Fuca Basin. This area is forecasted to experience 1.0 formal, 4.9 informal, 0.1 technical assistance, 1.1 implementation, and 0.5 programmatic consultations annually. Multiplying these figures by the activity-specific administrative cost figure from Exhibit

[24] Forecasts for section 7 actions are based on historical numbers of completed section 7 consultations categorized as formal, informal, programmatic, conference, implementation, and pre-consultation/technical assistance.

3-3 yields an annual expected cost figure for the combined set of actions in the San Juan/Strait of Juan de Fuca unit of $32,100.

Repeating this approach across all of the basins, we anticipate incremental costs of $123,000 on an annualized basis (assuming a seven percent discount rate).

CALCULATING IMPACTS

As described in this section, we first estimate an annual number of incremental consultations expected to occur resulting from rockfish critical habitat designation in each affected basin for each affected activity type, based on historical consultation rates, by basin and type. We then apply estimated costs per consultation to those estimated future consultations, and assume that the consultation rate occurs at a consistent pace over the time frame for this analysis (20 years). For example, in the San Juan/Strait of Juan de Fuca Basin, 4.2 nearshore consultation actions, including 1.9 transportation actions, 0.5 water quality actions, and 1.2 other consultation actions are anticipated annually based on past rates of consultation for rockfish. Of the nearshore actions, 1.2 are anticipated to be formal, 2.6 informal, and 0.4 programmatic each year. This translates into 84 consultation actions anticipated over the period of analysis.

Because all areas considered for critical habitat are occupied by the listed rockfish, incremental costs associated with the additional effort needed to address potential adverse modification of habitat for rockfish are limited in most areas. The analysis assumes that the administrative effort to address jeopardy forms part of the baseline effort to consider other NOAA Fisheries-listed species present in these basins (i.e., killer whale, green sturgeon, listed salmon/steelhead DPSs, and eulachon). As a result, the only incremental administrative effort in most basins is to address potential adverse modification for listed rockfish critical habitat. Thus, annual costs of consultation actions in the San Juan/Strait of Juan de Fuca Basin are calculated assuming that rockfish critical habitat will be considered as part of consultations that would already be expected to occur under the listing of the species. Drawing on the administrative costs presented in Exhibit 3-3, annual costs of nearshore consultations in the San Juan/Strait of Juan de Fuca Basin are calculated as:

$$(1.2*\$2,430) + (2.55*\$1,750) + (0.4*\$5,270) = \$9,580$$

This calculation is repeated for each consultation type, for each activity, in each basin. Cost estimates are then summed and multiplied by the expected number of consultations over the period of our analysis (20 years). These costs are then discounted at rates of seven and three percent, and summed to estimate total present value costs of consultations by basin over the period of analysis for each activity type. Finally, annualized costs are calculated (see Exhibit 2-4).

EXHIBIT 3-6. ANNUAL NUMBER AND COSTS OF FORECAST CONSULTATIONS BY BASIN AND CONSULTATION TYPE

BASIN	FORMAL	INFORMAL	TECHNICAL ASSISTANCE	IMPLEMENTATION	PROGRAMMATIC	TOTAL ACTIONS	ANNUALIZED COSTS (SEVEN PERCENT)	ANNUALIZED COSTS (THREE PERCENT)
San Juan/Strait of Juan de Fuca Basin	1.0	4.9	0.1	1.1	0.5	7.7	$32,100	$32,100
Whidbey Basin	0.7	5.9	0.4	0.6	0.3	7.8	$30,100	$30,100
Main Basin	1.6	5.9	0.9	0.1	0.3	8.7	$29,000	$29,000
Hood Canal	0.9	2.7	0.1	0.1	0.2	3.9	$10,200	$10,200
South Puget Sound	1.3	2.7	0.6	0.6	0.3	5.4	$21,200	$21,200
Total	**5.5**	**22.0**	**2.0**	**2.5**	**1.5**	**33.5**	**$123,000**	**$123,000**

Notes:

1. Each section 7 action forecast receives costs associated with its consultation type (e.g., formal, informal, programmatic, or technical assistance) and activity. Estimates are based on the average number of past consultations for the rockfish in these watersheds over the last two years (i.e., 2010-2011).
2. Because some consultations span multiple watersheds and multiple basins, and because past consultation rates are averaged, anticipated consultations are sometimes presented as decimals.

Costs are discounted at seven percent and annualized over 20 years.

REFERENCES

16 U.S.C. 1532.

75 FR 22276.

Burns, R. 1985. The shape and forms of Puget Sound. Published by Washington Sea Grant, and distributed by the University of Washington Press. 100 pages.

Downing, J. The Coast of Puget Sound: Its Processes and Development. 1983. Washington Sea Grant, University of Washington Press, Seattle. 126 pages.

Federal Energy Regulatory Commission, Wetland and Waterbody Construction and Mitigation Procedures, January 17, 2003.

Gramlich, Edward M., A Guide to Benefit-Cost Analysis (2nd Ed.), Prospect Heights, Illinois: Waveland Press, Inc., 1990.

Letter from Peter Goldmark, Department of Natural Resources, accessed at http://nwdivers.me/blog/?p=627 on February 28, 2012.

Levin, P.S., JA Coyer, R Petrik and T.P. Good. 2002. Community-wide effects of nonindigenous species on temperate rocky reefs. Ecology 83:3182-3193.

National Marine Fisheries Service, Northwest Fisheries Science Center. August 2005. Final Economic Analysis of Critical Habitat Designation for 12 West Coast Salmon and Steelhead DPSs.

NOAA Fisheries. 2002. Endangered Species Act Section 7 Formal Programmatic Consultation and Magnuson-Stevens Act Essential Fish Habitat Consultation on Bureau of Land Management, Forest Service, and BIA/Coquille Indian Tribe Actions, # 2002/00879, October 18, 2002.

NOAA Fisheries. 2004. Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery and Conservation Management Act Essential Fish Habitat Consultation on Resource Management Systems for Dry Cropland and Range and Pastureland in Gilliam, Sherman and Wasco Counties, Oregon, #2002/00111, April 22, 2004.

NOAA Fisheries. 2005. Final Economic Analysis of Critical Habitat Designation for 12 West Coast Salmon and Steelhead DPSs, Seattle, WA, August 2005.

NOAA Fisheries. 2006. Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Pacific Rock Products Instream Sand and Gravel Mining, #2006/01053, August 25, 2006.

NOAA Fisheries. 2007. Endangered Species Act Section 7 Formal Programmatic Consultation and Magnuson-Stevens Fishery Conservation and Management Act

Essential Fish Habitat Consultation for Fish Habitat Restoration Activities in Oregon and Washington, CY2007-CY2012, # 2006/0653, April 28, 2007.

NOAA Fisheries. 2009. Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Boise National Forest South Fork Salmon River Noxious and Invasive Weed Management Program, #2009/05069, November 12, 2009.

NOAA Fisheries. 2009. Endangered Species Act Section 7 Formal Programmatic Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Salmon-Challis National Forest Travel Plan, #2009/02644, August 12, 2009.

NOAA Fisheries. 2011. Endangered Species Act Section 7 Formal Informal Consultation for Point Roberts Marina Maintenance Dredging project, Whatcom County, WA, # 2011/00455, February 17, 2011.

NOAA Fisheries. 2011. Endangered Species Act Section 7 Formal Informal Consultation Merlino Bulkhead Repair, King County, WA, # 2010/05541, January 6, 2011.

NOAA Fisheries. 2011. Endangered Species Act Section 7 Formal Informal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fishing Habitat Consultation for Proposed Approval of Finfish Rearing Provision Contained in the Sediment Management Standards Rule Promulgated by the Washington State Department of Ecology, # 2010/06071, April 8, 2011.

NOAA Fisheries (NMFS). 2012. Proposed designation of critical habitat for the distinct population segments of yelloweye rockfish, canary rockfish, and bocaccio. National Marine Fisheries Service, Northwest Region, Protected Resources Division. Seattle Washington.

U.S. Environmental Protection Agency, Guidelines for Preparing Economic Analyses, September 2000.

U.S. Environmental Protection Agency, Guidelines for Preparing Economic Analyses, EPA 240-R-00-003, September 2000, available at http://yosemite.epa.gov/ee/epa/eed.nsf/ webpages/Guidelines.html.

U.S. Fish and Wildlife Service, "Endangered Species and Habitat Conservation Planning," August 6, 2002, accessed at http://endangered.fws.gov/hcp/.

U.S. Fish and Wildlife Service, Region 1, October 14, 2009.

U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf.

U.S. Office of Management and Budget, "Draft 2003 Report to Congress on the Costs and Benefits of Federal Regulations; Notice," 68 *Federal Register* 5492, February 3, 2003.

US Census data. Retrieved on August 2, 2011. Available at: http://quickfacts.census.gov/qfd/states/01000.html

US Census data. Retrieved on November 11, 2011. Available at: http://quickfacts.census.gov/qfd/states/01000.html

Written communication with NOAA biologist on August 19, 2011.

Written communication with NOAA Fisheries biologist on August 19, 2011.

Zerbe, R., and D. Dively, 1994. Benefit Cost Analysis in Theory and Practice, New York: HarperCollins.

APPENDIX A | SMALL BUSINESS AND ENERGY IMPACTS ANALYSES

This appendix considers the extent to which incremental impacts from critical habitat designation may be borne by small entities and the energy industry. The analysis presented in Section A.1 is conducted pursuant to the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996. The energy analysis in Section A.2 is conducted pursuant to Executive Order No. 13211.

The analyses of impacts to small entities and the energy industry rely on the estimated incremental impacts resulting from the proposed critical habitat designation. The incremental impacts of the rulemaking are most relevant for the small business and energy impacts analyses because they reflect costs that may be avoided or reduced based on decisions regarding the composition of the final rule.

A.1 SMALL BUSINESS REGULATORY ENFORCEMENT FAIRNESS ACT ANALYSIS

When a Federal agency proposes regulations, the RFA requires the agency to prepare and make available for public comment an analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions as defined by the RFA).[25] No initial regulatory flexibility analysis is required if the head of an agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. The SBREFA amended the RFA to require that Federal agencies provide a statement of the factual basis for certifying that a rule will not have significant economic impact on a substantial number of small entities. To assist in this process, this appendix provides a screening level analysis of the potential for rockfish critical habitat to affect small entities.

To ensure broad consideration of impacts on small entities, NOAA Fisheries has prepared this small business analysis without first making the threshold determination in the proposed rule regarding whether the proposed critical habitat designation could be certified as not having a significant economic impact on a substantial number of small entities. This small business analysis will therefore inform NOAA Fisheries' threshold determination.

[25] 5 U.S.C. § 601 *et seq*.

A.1.1 OVERVIEW OF RFA APPLICABILITY

This analysis is intended to improve NOAA's understanding of the potential effects of the proposed rule on small entities and to identify opportunities to minimize these impacts in the final rulemaking. The Act requires NOAA to designate critical habitat for threatened and endangered species to the maximum extent prudent and determinable. Section 4(b)(2) of the Act requires that NOAA designate critical habitat "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 impacts, of specifying any particular area as critical habitat." This section grants NOAA Fisheries discretion to exclude any area from critical habitat if (s)he determines "the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat." However, the Secretary may not exclude an area if it "will result in the extinction of the species."

Three types of small entities are defined in the RFA:

- **Small Business -** Section 601(3) of the RFA defines a small business as having the same meaning as small business concern under section 3 of the Small Business Act. This includes any firm that is independently owned and operated and is not dominant in its field of operation. The SBA has developed size standards to carry out the purposes of the Small Business Act, and those size standards can be found in 13 CFR 121.201. The size standards are matched to NAICS industries. The SBA definition of a small business applies to a firm's parent company and all affiliates as a single entity.
- **Small Governmental Jurisdiction -** Section 601(5) defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with a population of less than 50,000. Special districts may include those servicing irrigation, ports, parks and recreation, sanitation, drainage, soil and water conservation, road assessment, etc. When counties have populations greater than 50,000, those municipalities of fewer than 50,000 can be identified using population reports. Other types of small government entities are not as easily identified under this standard, as they are not typically classified by population.
- **Small Organization -** Section 601(4) defines a small organization as any not-for-profit enterprise that is independently owned and operated and not dominant in its field. Small organizations may include private hospitals, educational institutions, irrigation districts, public utilities, agricultural co-ops, etc.

The courts have held that the RFA/SBREFA requires Federal agencies to perform a regulatory flexibility analysis of forecast impacts to small entities that are directly regulated. In the case of *Mid-Tex Electric Cooperative, Inc., v. Federal Energy Regulatory Commission (FERC)*, FERC proposed regulations affecting the manner in which generating utilities incorporated construction work in progress in their rates. The generating utilities that expected to be regulated were large businesses; however, their customers—transmitting utilities such as electric cooperatives—included numerous small entities. In this case, the court agreed that FERC simply authorized large electric

generators to pass these costs through to their transmitting and retail utility customers, and FERC could therefore certify that small entities were not directly impacted within the definition of the RFA.[26]

Similarly, *American Trucking Associations, Inc. v. Environmental Protection Agency* addressed a rulemaking in which EPA established a primary national ambient air quality standard for ozone and particulate matter.[27] The basis of EPA's RFA/SBREFA certification was that this standard did not directly regulate small entities; instead, small entities were indirectly regulated through the implementation of State plans that incorporated the standards. The court found that, while EPA imposed regulation on States, it did not have authority under this rule to impose regulations directly on small entities and therefore small entities were not directly impacted within the definition of the RFA.

The SBA in its guidance on how to comply with the RFA recognizes that consideration of indirectly affected small entities is not required by the RFA, but encourages agencies to perform a regulatory flexibility analysis even when the impacts of its regulation are indirect.[28] "If an agency can accomplish its statutory mission in a more cost-effective manner, the Office of Advocacy [of the SBA] believes that it is good public policy to do so. The only way an agency can determine this is if it does not certify regulations that it knows will have a significant impact on small entities even if the small entities are regulated by a delegation of authority from the Federal agency to some other governing body."[29]

The regulatory mechanism through which critical habitat protections are enforced is section 7 of the Act, which directly regulates only those activities carried out, funded, or permitted by a Federal agency. By definition, Federal agencies are not considered small entities, although the activities they may fund or permit may be proposed or carried out by small entities. Given the SBA guidance described above, this analysis considers the extent to which this designation could potentially affect small entities, regardless of whether these entities would be directly regulated by NOAA Fisheries through the proposed rule or by a delegation of impact from the directly regulated entity.

This screening analysis focuses on small entities that may bear the incremental impacts of this rulemaking quantified in Section 3 of this economic analysis. As discussed in greater detail in Sections 2 and 3, incremental impacts of the designation of critical habitat are likely to be limited to administrative costs of section 7 consultations. Small entities may participate in section 7 consultation as a third party (the primary consulting parties being NOAA and the Federal action agency). It is therefore possible that the small entities may spend additional time considering critical habitat during section 7 consultation for

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[26] 773 F. 2d 327 (D.C. Cir. 1985).

[27] 175 F. 3d 1027, 1044 (D.C. Cir. 1999).

[28] Small Business Administration, Office of Advocacy. May 2003. A Guide for Government Agencies: How to Comply with the Regulatory Flexibility Act, pg. 20.

[29] *Ibid.*, pg. 21.

rockfish. Additional incremental costs of consultation that would be borne by the Federal action agency and NOAA are not relevant to this screening analysis as these entities (Federal agencies) are not small.

A.1.2 ANALYSIS OF IMPACTS TO SMALL ENTITIES

As described in Section 3, activities that may be affected by the designation include: nearshore work, transportation, water quality, utilities, and other activities including projects related to research, restoration, aquaculture, fisheries, and military activity.

We do not expect critical habitat designation to result in impacts to small entities for the following activities:

- *Utilities:* Section 3 of this analysis discusses the potential administrative costs to utilities associated with critical habitat. We do not forecast any incremental impacts to small entities engaged in these activities, as the only consultations associated with utilities activities are pre-consultation/technical assistance and programmatic consultations, which do not include any cost to third parties; therefore, we do not expect any impacts to small entities related to utilities.

Estimated incremental costs that may be borne by small entities consist of administrative impacts of section 7 consultation related to nearshore work, transportation, utilities, and other activities. These potential impacts are described in greater detail below.

- **Nearshore Work.** As described in Section 3.5, excluding programmatic and pre-consultation/technical assistance consultations, 15.5 consultations are expected to occur annually related to nearshore work activities (e.g., coastal construction). It is uncertain whether small entities will be project proponents for these consultations. The analysis conservatively assumes that all consultation costs will be borne by small entities.[30] This assumption overstates the likely impact on small entities because it also includes Federal costs of consultation. Using this assumption, the costs to small entities to participate in nearshore work-related consultations would be approximately $32,400 annually, or $1,900 per entity. This cost would represent less than 0.1 percent of annual revenues for entities in this sector.[31]
- **Transportation.** As described in Section 3.5, excluding programmatic and pre-consultation/technical assistance consultations, 6.5 consultations are expected to occur annually related to transportation projects. It is uncertain whether small entities will be project proponents for these consultations. This analysis conservatively assumes that all consultation costs will be borne by small

[30] As shown in Exhibit A-1, the vast majority of entities are small in this industry within counties containing areas assessed for critical habitat.

[31] Annual revenues for small entities conducting nearshore work are estimated to be $5.8 million using Risk Management Association (RMA), *Annual Statement Studies: Financial Ratio Benchmarks 2011 to 2012,* 2011. This figure represents a weighted average across two NAICS codes (237120 and 713930) and is weighted based on the number of entities of varying size classes below the small entity threshold (e.g., $0 to $1 million, $1 million to $3 million, $3 to $5 million, etc.).

entities.[32] This assumption overstates the likely impact on small entities because it also includes Federal costs of consultation. Using this assumption, the costs to small entities to participate in transportation consultations would be approximately $46,000 annually, or $7,700 per entity. This cost would represent less than 0.1 percent of annual revenues for entities in the transportation sector.[33]

- **Water Quality.** As described in Section 3.5, excluding programmatic and pre-consultation/technical assistance consultations, 2.5 consultations are expected to occur annually related to water quality activities (e.g., for NPDES permits). It is uncertain whether small entities will be project proponents for these consultations. This analysis conservatively assumes that all consultation costs will be borne by small entities.[34] This assumption overstates the likely impact on small entities because it also includes Federal costs of consultation. Using this assumption, the costs to small entities to participate in consultations related to water quality issues would be approximately $23,000 annually, or $9,100 per entity. This cost would represent 1.3 percent of annual revenues for entities in this sector.[35]
- **Other Activities, including Fishing.** As described in Section 3.5, excluding programmatic and pre-consultation/technical assistance consultations, 8 consultations are expected to occur annually related to other activities, including fisheries activities. It is uncertain whether small entities will be project proponents for these consultations. This analysis conservatively assumes that all consultation costs will be borne by small entities. This assumption overstates the likely impact on small entities because it also includes Federal costs of consultation. Using this assumption, the costs to small entities to participate in consultations on other activities would be approximately $18,000 annually, or $2,600 per entity. This cost would represent 1.1 percent of annual revenues for entities in this sector.[36]

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[32] As shown in Exhibit A-1, the vast majority of entities are small in this industry within counties containing areas assessed for critical habitat.

[33] Annual revenues in the transportation sector are estimated to be $9.8 million using Risk Management Association (RMA), *Annual Statement Studies: Financial Ratio Benchmarks 2011 to 2012,* 2011. This figure represents a weighted average of entities included in NAICS codes 237310 and weighted based on the number of entities of varying size classes below the small entity threshold (e.g., $0 to $1 million, $1 million to $3 million, $3 to $5 million, etc.).

[34] As shown in Exhibit A-1, the vast majority of entities are small in this industry within counties containing areas assessed for critical habitat.

[35] Annual revenues for entities involved in water quality consultations are estimated to be $0.7 million using Risk Management Association (RMA), *Annual Statement Studies: Financial Ratio Benchmarks 2011 to 2012,* 2011. This figure represents a weighted average across two NAICS codes (221310 and 221320) and weighted based on the number of entities of varying size classes below the small entity threshold (e.g., $0 to $1 million, $1 million to $3 million, $3 to $5 million, etc.).

[36] Annual revenues for "other" consultations primarily include fishing activities and are estimated to be $0.2 million. Sources include LexisNexis, (2012), *0273 and 4952* [SIC codes], retrieved from LexisNexis® Dossier Suite database; NAICS code 114111 is estimated using *Risk Management Association (RMA), Annual Statement Studies: Financial Ratio Benchmarks 2010 to 2011,* 2010.

Exhibit A-1 presents the results of this analysis. It provides the relevant small entity thresholds by NAICS code, the total number of entities and small entities, and the estimated incremental impacts as a percentage of annual revenues.

EXHIBIT A-1. SUMMARY OF POTENTIAL IMPACTS ON SMALL ENTITIES

ACTIVITY	INDUSTRY (NAICS CODES)	SMALL ENTITY SIZE STANDARD	TOTAL NUMBER OF ENTITIES IN COUNTIES CONTAINING PROPOSED CRITICAL HABITAT	NUMBER OF SMALL ENTITIES IN COUNTIES CONTAINING PROPOSED CRITICAL HABITAT	NUMBER OF SMALL ENTITIES AFFECTED ANNUALLY[1]	ANNUALIZED INCREMENTAL ECONOMIC IMPACTS TO SMALL BUSINESSES[2]	ANNUALIZED INCREMENTAL ECONOMIC IMPACTS TO SMALL BUSINESSES PER AFFECTED ENTITY	AVERAGE ANNUAL REVENUES PER SMALL ENTITY[3]	IMPACTS AS PERCENTAGE OF ANNUAL SMALL ENTITY REVENUES
Water Quality	Water Supply and Irrigation (221310)	$7.0 million average annual receipts	258	237	2.5	$23,000	$9,100	$0.7 million	1.3%
	Sewage Treatment Facilities (221320)		32	14					
Transportation	Highway, Street, and Bridge Construction (237310)	$33.5 million average annual receipts	512	468	6	$46,000	$7,700	$9.8 million	0.08%
Utilities	Water and Sewer Line and Related Structures Construction (237110)	$33.5 million average annual receipts	293	245	0	$0	$0	$8.5 million	N/A
	Oil and Gas Pipeline and Related Structures Construction (237120)	$7.0 million average annual receipts	27	24					

ACTIVITY	INDUSTRY (NAICS CODES)	SMALL ENTITY SIZE STANDARD	TOTAL NUMBER OF ENTITIES IN COUNTIES CONTAINING PROPOSED CRITICAL HABITAT	NUMBER OF SMALL ENTITIES IN COUNTIES CONTAINING PROPOSED CRITICAL HABITAT	NUMBER OF SMALL ENTITIES AFFECTED ANNUALLY[1]	ANNUALIZED INCREMENTAL ECONOMIC IMPACTS TO SMALL BUSINESSES[2]	ANNUALIZED INCREMENTAL ECONOMIC IMPACTS TO SMALL BUSINESSES PER AFFECTED ENTITY	AVERAGE ANNUAL REVENUES PER SMALL ENTITY[3]	IMPACTS AS PERCENTAGE OF ANNUAL SMALL ENTITY REVENUES
	Power and Communication Line and Related Structures Construction (237130)	$33.5 million average annual receipts	58	45					
Nearshore Work	Other Heavy and Civil Engineering Construction (237990)	$33.5 million average annual receipts	230	217	14.5	$27,000	$1,900	$5.8 million	0.03%
	Marinas (713930)	$7.0 million average annual receipts	189	181					
Other	Finfish Fishing (114111)	$4.0 million average annual receipts	169	128	7	$18,000	$2,600	$0.2 million	1.28%
	Shellfish Fishing (114112)		891	872					
	Shellfish Farming (112512)	$750,000 average annual receipts	74	63					
	Other Aquaculture (112519)		8	5					

ACTIVITY	INDUSTRY (NAICS CODES)	SMALL ENTITY SIZE STANDARD	TOTAL NUMBER OF ENTITIES IN COUNTIES CONTAINING PROPOSED CRITICAL HABITAT	NUMBER OF SMALL ENTITIES IN COUNTIES CONTAINING PROPOSED CRITICAL HABITAT	NUMBER OF SMALL ENTITIES AFFECTED ANNUALLY[1]	ANNUALIZED INCREMENTAL ECONOMIC IMPACTS TO SMALL BUSINESSES[2]	ANNUALIZED INCREMENTAL ECONOMIC IMPACTS TO SMALL BUSINESSES PER AFFECTED ENTITY	AVERAGE ANNUAL REVENUES PER SMALL ENTITY[3]	IMPACTS AS PERCENTAGE OF ANNUAL SMALL ENTITY REVENUES
	Research and Development in the Physical, Engineering, and Life Sciences (541712)	500 employees	0	0					

Notes:
1. To estimate the number of affected small entities, this analysis assumes one small entity per forecast section 7 consultation, not including programmatic consultations or pre-consultation/technical assistance.
2. Assumes that all impacts are borne by small entities. This overstates impacts, as some consultation impacts will be borne by Federal entities.
3. Annual revenues are estimated using Risk Management Association (RMA), *Annual Statement Studies: Financial Ratio Benchmarks 2010 to 2011,* 2010. For each NAICS code, RMA provides the net sales and the number of entities falling within several sales categories: $0 to $500,000, $500,000 to $2 million, $2 to $10 million, or $10 to $50 million. Based on the number of entities and total net sales falling within each sales category, we developed an estimate of average net sales (revenues) per small entity. Specifically, the analysis averages data for the sales categories at or below the small business threshold for each industry.
Source: Dialog search of File 516, Dun and Bradstreet, "Duns Market Identifiers," on January 5, 2011.

A.2 POTENTIAL IMPACTS TO THE ENERGY INDUSTRY

Pursuant to Executive Order No. 13211, "Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use," issued May 18, 2001, Federal agencies must prepare and submit a "Statement of Energy Effects" for all "significant energy actions." The purpose of this requirement is to ensure that all Federal agencies "appropriately weigh and consider the effects of the Federal Government's regulations on the supply, distribution, and use of energy."[37]

The Office of Management and Budget provides guidance for implementing this Executive Order, outlining nine outcomes that may constitute "a significant adverse effect" when compared with the regulatory action under consideration:

- Reductions in crude oil supply in excess of 10,000 barrels per day (bbls);
- Reductions in fuel production in excess of 4,000 barrels per day;
- Reductions in coal production in excess of 5 million tons per year;
- Reductions in natural gas production in excess of 25 million Mcf (1,000 cubic feet) per year;
- Reductions in electricity production in excess of 1 billion kilowatts-hours per year or in excess of 500 megawatts of installed capacity;
- Increases in energy use required by the regulatory action that exceed the thresholds above;
- Increases in the cost of energy production in excess of one percent;
- Increases in the cost of energy distribution in excess of one percent; or
- Other similarly adverse outcomes.[38]

As presented in Exhibit 3-5, costs related to all economic activities for conservation of rockfish critical habitat are relatively small, at approximately $123,000 annually. As presented in Exhibit 3-4, there is a current proposal to construct a pier north of Bellingham, WA to enable the export of coal from the Interior West. Neither the specific future location of this port, which could also be slated for the Columbia River area, or several other potential locations in Washington or Oregon, nor the specific design of the project is known. However, to the extent that the project is constructed in rockfish critical habitat near Bellingham, WA, it would also affect designated critical habitat for the southern resident killer whale and Puget Sound Chinook salmon. Similarly, proposals for tidal and wave energy projects exist in Puget Sound. However, NMFS has not identified likely conservation efforts for rockfish critical habitat that would not already likely be requested under the species listing. As such, incremental impacts of rockfish

[37] Memorandum For Heads of Executive Department Agencies, and Independent Regulatory Agencies, Guidance For Implementing E.O. 13211, M-01-27, Office of Management and Budget, July 13, 2001, http://www.whitehouse.gov/omb/memoranda/m01-27.html.

[38] *Ibid*.

critical habitat are not anticipated on these projects. Thus, incremental impacts to energy production or storage are not anticipated as a result of rockfish critical habitat designation.

APPENDIX B | LAWS AND REGULATIONS THAT MAY PROVIDE BASELINE PROTECTION FOR ROCKFISH

CLEAN WATER ACT (33 U.S.C. 1251 ET SEQ. 1987)

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States. It gives the Environmental Protection Agency (EPA) the authority to implement pollution control programs such as setting wastewater standards for industry. The CWA also continued requirements to set water quality standards for all contaminants in surface waters.

Pursuant to Section 404 of the CWA, it is unlawful for any person to dredge, dispose of dredge material, or discharge a pollutant from a point source into navigable waters, unless a permit is obtained from the U.S. Army Corps of Engineers (USACE). As part of pollution prevention activities, the USACE may limit activities in waterways through the Section 404 permitting process, independent of rockfish concerns. These reductions in pollution may benefit rockfish critical habitat.

Pursuant to Section 402 of the CWA and under the National Pollutant Discharge Elimination System (NPDES) program, EPA sets pollutant-specific limits on the point source discharges for major industries and provides permits to individual point sources that apply to these limits. Under the water quality standards program, EPA, in collaboration with States, establishes water quality criteria to regulate ambient concentrations of pollutants in surface waters.

Under section 401 of the CWA, all applicants for a Federal license or permit to conduct activity that may result in discharge to navigable waters are required to submit a State certification to the licensing or permitting agency. Costs associated with preparing water control plans or permits are considered baseline protection in this analysis, though any additional requirements to protect rockfish critical habitat would be considered incremental to the current rule.

MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT REAUTHORIZATION ACT OF 2006

This law, signed by the President in January 2007, amends the older Magnuson-Stevens Fishery Conservation and Management Act (as amended through 1996) that included provision for the description of essential fish habitat in fishery management plans and consideration of actions to ensure the conservation and enhancement of habitat. The newer Magnuson-Stevens Reauthorization Act mandates the use of annual catch limits and accountability measures to end overfishing, provides for widespread market-based fishery management through limited access programs, and calls for increased international cooperation. While the Act has implications for rockfish in Pacific marine

waters, as well as federally managed fisheries, it is less applicable in Puget Sound, where fisheries are State-managed.

FEDERAL POWER ACT (16 U.S.C. § 800 1920, AS AMENDED)

The Federal Power Act (FPA) was promulgated to establish the Federal Energy Regulatory Commission (FERC) to oversee non-Federal hydropower generation. The FERC is an independent Federal agency governing approximately 2,500 licenses for non-Federal hydropower facilities and has responsibility for national energy regulatory issues.

To the extent that estuarine or marine waters are considered to be within the action area for hydropower facilities, the Act may provide protection to rockfish habitat from hydropower activities. Section 10(j) of the Federal Power Act (FPA) was promulgated to ensure that FERC considers both power and non-power resources during the licensing process. More specifically, section 18 of the FPA states that FERC shall require the construction, operation, and maintenance by a licensee at its own expense of a fishway if prescribed by the Secretaries of the Interior (delegated to the Fish and Wildlife Service) and Commerce (NOAA).

FISH AND WILDLIFE COORDINATION ACT (16 U.S.C.§§ 661-666 1934, AS AMENDED)

This law provides that, whenever the waters or channels of a body of water are modified by a department or agency of the U.S. government, the department or agency must first consult with the U.S. Fish and Wildlife Service and with the head of the agency exercising administration over the wildlife resources of the State where modification will occur with a view to the conservation of wildlife resources.

The purpose of this Act is to ensure that fish and wildlife resources are equally considered with other resources during the planning of water resources development projects by authorizing FWS to provide assistance to Federal and State agencies in protecting game species and studying the effects of pollution on wildlife. This Act may offer protection to rockfish habitat by requiring consultation concerning the species with FWS for all activities with a Federal nexus.

RIVERS AND HARBORS ACT (33 USC §§ 401 ET SEQ. 1938)

The Rivers and Harbors Act (RHA) places Federal improvements of rivers, harbors, and other waterways under the jurisdiction of the Department of the Army, USACE and requires that all improvements include due regard for wildlife conservation.

This Act may provide protection to the rockfish critical habitat related to nearshore construction activities. Under sections 9 and 10 of the RHA, the USACE is authorized to regulate the construction of any structure or work within navigable waterways. This includes, for example, bridges and docks.

NATIONAL ENVIRONMENTAL POLICY ACT (42 USC §§ 4321-4345 1969)

The National Environmental Policy Act (NEPA) requires that all Federal agencies conduct a detailed environmental impact statement on every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment.

The NEPA process may provide protection to rockfish critical habitat for activities that have Federal involvement, if alternatives are considered and selected that are less harmful to the rockfish critical habitat than other alternatives.

THE SIKES ACT IMPROVEMENTS ACT (16 USC §670 1997)

The Sikes Act Improvement Act (SAIA) requires military installations to prepare and implement an Integrated Natural Resources Management Plan (INRMP). The purpose of the INRMP is to provide for:

- the conservation and rehabilitation of natural resources on military installations;
- the sustainable multipurpose use of the resources, which shall include hunting, fishing, trapping, and nonconsumptive uses; and
- public access to military installations to facilitate the use of the resources, subject to safety requirements and military security.

INRMPs developed in accordance with SAIA may provide protection to rockfish critical habitat on military lands.

OTHER STATUTES AND REGULATIONS THAT APPLY TO LAND USE ACTIVITIES

While the following statutes and regulations may apply to lands and waters that fall within rockfish habitat areas, they are unlikely to provide significant baseline protections and are not considered in the analysis.

- *Fish and Wildlife Conservation Act (16 USC §§ 2901-2911 1980, as amended)* – The FWCA encourages States to develop, revise, and implement, in consultation with Federal, State, local, and regional agencies, a plan for the conservation of fish and wildlife, particularly species indigenous to the State.
- *Water Resources Development Act (33 USC §§ 2201-2330 1986, as amended)* - WRDA authorizes the construction or study of USACE projects and outlines environmental assessment and mitigation requirements.
- *Anadromous Fish Conservation Act (16 USC §§ 757 et seq. 1965)* - The AFCA authorizes the Secretary of the Interior to enter into agreements with States and other non-Federal interests to conserve, develop, and enhance the anadromous fish resources of the U.S.
- *Coastal Zone Management Act (16 USC §§ 1451 et seq. 1972)* - CZMA establishes an extensive Federal grant program to encourage coastal States to develop and implement coastal zone management programs to provide for

protection of natural resources, including wetlands, flood plains, estuaries, beaches, dunes, barrier islands, coral reefs, and fish and wildlife and their habitat.

APPENDIX C | SUPPLEMENTAL ADMINISTRATIVE COST INFORMATION

This appendix provides additional detail regarding the calculation of administrative costs by watershed and by activity. Specifically, it presents the number of consultation actions estimated annually (formal, informal, technical assistance, programmatic) by watershed and activity. Consultations classified as "implementation" and "conference" opinions are assumed to be formal for the purposes of this analysis.

EXHIBIT C-1. ANNUAL NUMBER OF FORECAST FORMAL SECTION 7 CONSULTATIONS BY BASIN AND ACTIVITY

BASIN	NEARSHORE WORK	TRANSPORTATION	UTILITIES	WATER SUPPLY	OTHER	TOTAL
Hood Canal	0.1	-	-	-	0.8	0.9
Main Basin	0.1	-	-	0.3	1.3	1.6
San Juan/Strait of Juan de Fuca Basin	0.1	-	-	0.3	0.7	1.0
South Puget Sound	0.1	0.5	-	-	0.7	1.25
Whidbey Basin	0.1	-	-	-	0.6	0.7
Total	**0.5**	**0.5**	**-**	**0.5**	**4**	**5.5**
Note: Totals may not sum due to rounding.						

EXHIBIT C-2. ANNUAL NUMBER OF FORECAST INFORMAL SECTION 7 CONSULTATIONS BY BASIN AND ACTIVITY

BASIN	NEARSHORE WORK	TRANSPORTATION	UTILITIES	WATER SUPPLY	OTHER	TOTAL
Hood Canal	2.05	0.1	-	0.2	0.3	2.65
Main Basin	3.55	0.85	-	0.7	0.8	5.9
San Juan/Strait of Juan de Fuca Basin	2.55	1.85	-	0.2	0.3	4.9
South Puget Sound	1.3	0.35	-	0.7	0.3	2.65
Whidbey Basin	2.55	1.85	-	0.2	1.3	5.9
Total	**12**	**5**	**-**	**2**	**3**	**22**
Note: Totals may not sum due to rounding.						

EXHIBIT C-3. ANNUAL NUMBER OF FORECAST TECHNICAL ASSISTANCE SECTION 7 CONSULTATIONS BY BASIN AND ACTIVITY

BASIN	NEARSHORE WORK	TRANSPORTATION	UTILITIES	WATER SUPPLY	OTHER	TOTAL
Hood Canal	-	-	-	-	0.1	0.1
Main Basin	-	-	0.75	-	0.1	0.85
San Juan/Strait of Juan de Fuca Basin	-	-	-	-	0.1	0.1
South Puget Sound	-	0.5	-	-	0.1	0.6
Whidbey Basin	-	-	0.25	-	0.1	0.35
Total	**-**	**0.5**	**1**	**-**	**0.5**	**2**

Note: Totals may not sum due to rounding.

EXHIBIT C-4. ANNUAL NUMBER OF FORECAST PROGRAMMATIC SECTION 7 CONSULTATIONS BY BASIN AND ACTIVITY

BASIN	NEARSHORE WORK	TRANSPORTATION	UTILITIES	WATER SUPPLY	OTHER	TOTAL
Hood Canal	0.1	-	-	-	0.1	0.2
Main Basin	0.1	-	-	-	0.1	0.2
San Juan/Strait of Juan de Fuca Basin	0.4	-	-	-	0.1	0.5
South Puget Sound	0.2	-	-	-	0.1	0.3
Whidbey Basin	0.1	-	-	-	0.1	0.2
Total	**1**	**-**	**-**	**-**	**0.5**	**1.5**

Note: Totals may not sum due to rounding.

EXHIBIT C-5. ANNUAL NUMBER OF FORECAST IMPLEMENTATION SECTION 7 CONSULTATIONS BY BASIN AND ACTIVITY

BASIN	NEARSHORE WORK	TRANSPORTATION	UTILITIES	WATER SUPPLY	OTHER	TOTAL
Hood Canal	0.1	-	-	-	-	0.1
Main Basin	0.1	-	-	-	-	0.1
San Juan/Strait of Juan de Fuca Basin	1.1	-	-	-	-	1.1
South Puget Sound	0.6	-	-	-	-	0.6
Whidbey Basin	0.1	0.5	-	-	-	0.6
Total	**2**	**0.5**	**-**	**-**	**-**	**2.5**

Note: Totals may not sum due to rounding.

EXHIBIT C-6. FORECAST ANNUAL SECTION 7 CONSULATIONS BY BASIN AND TYPE OF CONSULTATION –TABLE GOT TRANSPOSED

BASIN	FORMAL	INFORMAL	TECHNICAL ASSISTANCE	PROGRAMMATIC	IMPLEMEN-TATION	TOTAL	ANNUALIZED COSTS (DISCOUNTED AT SEVEN PERCENT)
Hood Canal	0.9	2.7	0.1	0.2	0.1	3.9	$10,200
Main Basin	1.6	5.9	0.9	0.2	0.1	8.7	$29,000
San Juan/Strait of Juan de Fuca Basin	1.0	4.9	0.1	0.5	1.1	7.7	$32,100
South Puget Sound	1.3	2.7	0.6	0.3	0.6	5.4	$21,200
Whidbey Basin	0.7	5.9	0.4	0.2	0.6	7.8	$30,100
Total	**5.5**	**22**	**2**	**1.5**	**2.5**	**33.5**	$123,000

Note: "Formal" consultations include consultations classified as "formal," "emergency," "conference" and "implementation".

EXHIBIT C-7. PAST ANNUAL SECTION 7 CONSULATIONS BY TYPE OF CONSULTATION, 2009-2011

	2009	2010	2011	TOTAL	ANNUAL AVERAGE (AVERAGED OVER 2009-2011)	ANNUAL AVERAGE (AVERAGED OVER 2010-2011)
Formal	-	7	4	11	3.7	5.5
Informal	-	-	5	5	1.7	2.5
Technical Assistance	1	19	24	44	14.7	22
Programmatic	3	-	1	4	1.3	2
Implementation	-	3	-	3	1	1.5
Total	**4**	**29**	**34**	**67**	**22.3**	**33.5**
Note: Totals may not sum due to rounding.						

EXHIBIT C-8. PAST ANNUAL SECTION 7 CONSULATIONS BY ACTIVITY, 2009-2011

	2009	2010	2011	TOTAL	ANNUAL AVERAGE (AVERAGED OVER 2009-2011)	ANNUAL AVERAGE (AVERAGED OVER 2010-2011)
Nearshore work	-	16	15	31	10.3	15.5
Other	2	7	7	16	5.3	8
Transportation	-	3	10	13	4.3	6.5
Utilities	2	-	-	2	0.7	1
Water Quality	-	3	2	5	1.7	2.5
Total	**4**	**29**	**34**	**67**	**22.3**	**33.5**
Note: Totals may not sum due to rounding.						

EXHIBIT C-9. FORECAST ANNUAL COSTS BY BASIN AND ACTIVITY (DISCOUNTED AT SEVEN PERCENT)

BASIN	NEARSHORE WORK	TRANSPORTATION	UTILITIES	WATER QUALITY	OTHER	TOTAL
San Juan/Strait of Juan de Fuca Basin	$9,590	$13,600	$0	$5,700	$3,170	$32,100
Whidbey Basin	$5,740	$18,300	$23	$1,410	$4,570	$30,100
Main Basin	$7,480	$6,260	$69	$9,230	$5,950	$29,000
Hood Canal	$4,600	$736	$0	$1,410	$3,450	$10,200
South Puget Sound	$4,990	$8,240	$0	$4,940	$3,030	$21,200
Total	**$32,400**	**$47,200**	**$91**	**$22,700**	**$20,200**	**$123,000**