

# HABITAT AREAS OF PARTICULAR CONCERN (HAPC) PROPOSAL

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Please check applicable box (es):
<input checked="" type="checkbox"/> GOA Groundfish FMP
<input type="checkbox"/> BSAI Groundfish FMP
<input checked="" type="checkbox"/> Scallop FMP
<input type="checkbox"/> BSAI Crab FMP
<input checked="" type="checkbox"/> Salmon FMP

**Title of Proposal.**

Prince William Sound (PWS) Deepwater Canyon

**HAPC Site Location.**

*(Specific latitude/longitude or geographic reference. Include NOAA Chart number, if known.)*

Prince William Sound Deepwater Canyon

General coordinate description is as follows:

Northern extent: 60°45.793', -146°55.54'

Southern extent: 60°30.1', -146°55.931'

Eastern extent: 60°37.004, -146°45.928'

Western extent: 60°38.467, -146°57.583'

**Summary Statement of the Proposal.**

*(Provide a brief paragraph concisely describing the HAPC.)*

The PWS deepwater canyon is critical to the entire PWS ecosystem. TOC proposes the designation of the canyon as a HAPC in order to highlight the ecological importance and rarity of the area, encourage further research of the deepwater canyon habitat and associated species, and to ensure adequate EFH consultation in order to protect the area from the potential effects of activities such as oil barging and cruise ship pollutant discharge.

**Statement of Purpose and Need.**

*(Provide a specific purpose as why the HAPC needs to be identified.)*

The PWS marine ecosystem supports commercial, recreational and subsistence fisheries for salmon, herring, rockfish, cod, sablefish, halibut, pollock and shellfish (NPFMC 2000).

Approximately 100 million pounds of fish are taken from these waters annually. The deepwater canyon is critical to the balance of the PWS food chain. The canyon provides deep-water habitat for a variety of species including overwintering Neocalanus copepods (Kline 1999) that are of critical important to juvenile salmon (Cooney 1993). Continued wild salmon production is paramount to the continued economic and ecological health of PWS.

Prince William Sound's waters and its roughly 3,000 miles of shoreline also support large numbers of sea birds, marine mammals, and, until recently, some of the world's richest herring

and salmon fisheries. Five major salmon hatcheries operate in the Sound. Other important fisheries include dungeness crab, shrimp, halibut and other groundfish. The Sound is home water to one of the world's densest populations of sea otters and killer whales. Seals, sea lions and other cetaceans are also residents and, when combined with the otters and orcas, may represent the world's most profuse population of marine mammals (PWSSC 2003).

Potential impacts to this area are currently little understood. The January 2000 Draft EFH EA states that "the area may be pretty hard to impact, [but] if the habitat was degraded, the consequences for the whole marine ecosystem of Prince William Sound could be catastrophic." The EA goes on to acknowledge the proximity of the canyon to oil shipping lanes and the potential for oil spills in the area as demonstrated by the Exxon-Valdez spill (NPFMC 2000). Today over 15 percent of the nation's oil is shipped through central PWS.

Cruise ships also frequent the Sound several months every year. Cruise ships are known to discharge toxic chemicals, thousands of gallons of waterwater, and tens of thousands of gallons of ballast water bearing pathogens and invasive species from foreign ports (GAO 2000; Eley 2000). A precautionary management approach including further research and a comprehensive EFH consultation process is needed to ensure adequate protection of this important and rare habitat.

#### **Habitat Type and Species Information.**

*(Identify of any habitat type(s) and FMP species of the HAPC.)*

The deep water canyon (60° 36.956', -146° -52.543') is designated as EFH for the following species: Pacific Cod -- Adults, Late Juveniles, Arrowtooth Flounder -- Adults, Late Juveniles, Walleye Pollock -- Adults, Late Juveniles, Sablefish -- Adults, Late Juveniles, Sculpin -- Adults, Late Juveniles, Flathead Sole -- Adults, Late Juveniles, Rex Sole -- Adults, Late Juveniles, Yellowfin Sole -- Adults, Late Juveniles (NOAA 2003). Halibut, golden king crab, Tanner crab, and juvenile salmon are also found in this area (NPFMC 2000).

#### **Describe How the Proposal Addresses the each of the 4 HAPC Considerations (50CFR 600.815):**

The **IMPORTANCE** of the ecological function provided by the habitat.

Prince William Sound (PWS) supports commercial, recreational, and subsistence fisheries for salmon, herring, rockfish, cod, sablefish, halibut, pollock and shellfish. Just east of Lone Island is a 200 to 2800 feet (> 600 m) deep trench. Recent research indicates that this place is vital to maintaining the balance of PWS food chain. The Black Hole area (defined as the area > 600 m) provides deep-water habitat for Neocalanus copepods to overwinter (Kline 1999). They are thus present inside the Sound during the early spring phytoplankton bloom, and they graze this bloom heavily to produce very high zooplankton densities early in the annual marine production cycle. These copepods are very important to juvenile salmon (Cooney 1993). Thus the black hole area permits the maintenance of a high-efficiency trophic transfer from phytoplankton to fish, mediated by the copepods. If the habitat was degraded, the consequence for the whole marine ecosystem of PWS could be catastrophic (Jeff Short, NMFS, pers. Comm.. 8/24/9).<sup>1</sup>

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<sup>1</sup> This paragraph was taken from the 1999 EFH EA/RIR (Draft for Council Review), prepared by the NMFS for the NPFMC.

Furthermore, scientists around the world have identified unique biological processes occurring within submarine canyons, including<sup>2</sup>:

1. Canyons appear to be important sites of enhanced secondary production and, due to the nature of the canyons' topography and dramatic profiles, these sites provide diverse habitats perhaps not seen anywhere else on continental slopes. (DeDecker 2003)
2. Organic enrichment macrophyte detritus from canyon heads down to depths >500 m – combined with strong currents also transporting sediments – contribute to a much higher biomass compared to areas adjacent to canyons. In addition, species diversity was also found to be higher in canyons. (Vetter and Dayton 1998).
3. Ecological processes in canyons can be quite different than surrounding waters as a result of the high level of physical disturbance in combination with organic enrichment. (Vetter and Dayton 1998).
4. Microfaunal biomass in canyons can be up to 50 times greater than in non-canyon regions. Values vary with depths, however, and again this may result from the availability of sediment, organic carbon, photodetritus, and oxygen concentration. (Vetter and Dayton 1998).
5. 3 million individuals with a biomass of >1kg. M<sup>-2</sup> have been identified in La Jolla Canyon offshore California (Vetter, 1994).

√ The extent to which the habitat is **SENSITIVE** to human-induced degradation.

The extent to which the canyon habitat is sensitive to human-induced degradation is not entirely understood. Research indicates that egg and larval forms of many species are especially sensitive to petroleum hydrocarbons, even in extremely small quantities and at low concentrations. Long-term exposure to low concentrations can sometimes be as harmful as acute, short-term exposure to higher concentration (TOC 2002).

Oil from tankers is not the only potential source of oil pollution. Oil leaks can spring from a variety of places on a cruise ship. Spills and leaks occur during the use and transfer of fuels and lubricants for vessel propulsion system as well as other on-board mechanical systems.

Cruise ships and tankers also use tremendous amounts of ballast water to stabilize the vessels. Ballast water is often taken on in the coastal waters of one region and discharged at the next port of call. It is estimated that ballast water transports at least 7,000 different marine species each day around the world, and that the ballast water is discharged at a rate of 2 million gallons per hour (Carlton 2001).

Ballast water is the leading source of invasive species in U.S. marine waters. Invasive species are the second leading cause, after habitat destruction of biological diversity loss. Competition with and predation by invasive species affects at least 49 percent of endangered or threatened species in the United States (TOC 2002).

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<sup>2</sup> The five points are adapted from DeDecker 2003.

√ Whether, and to what extent, the activity **STRESSES** the habitat type.

The Prince William Sound serves as a shipping route for significant amounts of oil. Cruise ships frequenting the PWS produce immense amounts of liquid waste each day, including as much as 37,000 gallons of oily bilge water; 30,000 gallons of sewage; 255,000 gallons of non-sewage wastewater; 15 gallons of toxic chemicals from photo processing, dry cleaning and paints; tens of thousands of gallons of ballast water, bearing pathogens and invasive species from foreign ports (TOC 2002). The adverse effects of oil on the PWS environment has been well documented. (Clark 1986). The release of bilge water introduces foreign species into the ecosystem, which threatens its continued production and health. The damaging effects of toxics in the marine environment have also been well documented (Beckmen 2003).

√ The **RARITY** of the habitat type. (*Mandatory requirement*).

The Council already ranked the Prince William Sound deepwater canyon as being of “high” rarity in the draft HAPC Environmental Assessment and stated that the canyon is “probably the only one of its kind” (NPFMC 2000).

### **Objectives of the Proposal.**

*(List objectives specific to the identification of the HAPC.)*

The objectives of this proposal are to: 1) Provide protection for this unique and rare area from incidental disturbance from oil shipping and cruise ship pollution; and 2) Encourage further research of the deepwater canyon habitat and associated species.

### **Describe any Proposed Solutions and Management Measures to Achieve These Objectives.**

*(How might the problem be solved? Include concepts of methods of measuring progress towards those objectives.)*

Proposed activities to achieve the above stated objectives include:

- Designate the proposed area as a HAPC;
- Require adequate EFH consultation from oil and cruise ship industries to ensure protection of the deepwater basin ecosystem;
- Create an inventory of the physical environments and biological communities that inhabit the PWS deepwater canyon;
- Improve our knowledge of the structure, function, and variability of the PWS deepwater canyon ecosystem;
- Further our understanding of the relationships and population dynamics between commercial and non-commercial species which inhabit the PWS deepwater canyon;
- Further our knowledge of the local effects of pollutants resulting from cruise ship and oil shipping industries; AND
- Further our knowledge of the value of HAPCs as a conservation and fisheries management tool.

### **Identify any Expected Benefits to Habitat or FMP species.**

*(Include specific information regarding a species life history stage, if known.)*

Protection of the deepwater canyon as a HAPC will highlight the ecological importance and rarity of the area and thereby encourage further research of the deepwater canyon and its

associated species. The research will result in a fuller understanding and therefore more informed management decision about the canyon habitat and the various managed species which inhabit it. Furthermore, protection of the area will ensure appropriate EFH consultation with the oil and cruise ship industry. Any resulting changes in management of the area will benefit both habitat and FMP species.

**Identify Fishery, Stakeholders, and/or Communities, which may Benefit from the Proposed HAPC.**

*(Who may or may not benefit from the proposal? Include any known or indirect socioeconomic costs.)*

Based on the data available from the NPFMC, there is currently no active bottom trawling or long-line fishing in this area and the proposal does not recommend any management changes affecting commercial or recreational fishing. Therefore, we do not anticipate any direct or indirect socioeconomic costs to the fisheries industry.

The oil and cruise ship industry will be potentially impacted by the need to redirect this shipping lanes or travel corridors in order to avoid pollution discharge or minimize threats to the area. Any resulting changes will be the result of EFH consultation which determines that their activities may negatively impact the deepwater canyon habitat and FMP species.

The proposal will benefit the fishing community, research community and general public through the development of a more thorough understanding of the importance of this area to the Prince William Sound ecosystem.

**Supporting Data or Information Sources**

*(List data sources, information resource, literature, and any traditional knowledge for the proposal.)*

Please refer to Appendix A-Literature Cited.

## APPENDIX A-LITERATURE CITED

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