



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration

National Marine Fisheries Service

P.O. Box 21668

Juneau, Alaska 99802-1668

March 18, 2005

Dale Gardner  
Regional Planner  
Alaska Department of Environmental Conservation  
555 Cordova Street  
Anchorage, AK 99501

Dear Mr. Gardner:

The National Marine Fisheries Service (NMFS) reviewed the draft Southeast Alaska Subarea Contingency Plan available at <http://akrrt.ene.com>. Overall the plan provides a comprehensive resource that will be useful in planning for an oil spill.

We appreciate the opportunity to work with you and the Subarea Committee during the draft stage of revision of the Subarea Contingency Plan. Our section specific comments are enclosed as well as an informational white paper titled *Factors Affecting Chronic Effects of Polycyclic Aromatic Hydrocarbons on Aquatic Organisms*.

Please contact Cindy Hartmann at (907)586-7585 if you have any questions or for further coordination.

Sincerely,

James W. Balsiger  
Administrator, Alaska Region

Enclosures (2)

cc: Environmental Protection Agency, Mary Goolie, [goolie.mary@epa.gov](mailto:goolie.mary@epa.gov)  
Department of Interior, Doug Mutter, [Douglas\\_Mutter@ios.doi.gov](mailto:Douglas_Mutter@ios.doi.gov)  
U.S. Coast Guard, Rob Nakama, [rnakama@cgalaska.uscg.mil](mailto:rnakama@cgalaska.uscg.mil)  
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Cindy Hartmann

March 16, 2005

G:\Oil & Gas\Contingency Plans\SE Subarea Contingency Plan March 17 2005  
Comment Letter cah

Comment Letter has 2 Enclosures:

G:\Oil & Gas\Contingency Plans\SE Subarea Contingency Plan Enclosure NMFS Section  
Specific Detailed Comments March 16 2005 cah

G:\Oil & Gas\Contingency Plans\PAH\_Issues 1 Attachment from Adam Moles ABL for  
March 2005 comment letter.doc

Southeast Subarea Contingency Plan  
National Marine Fisheries Service  
Section Specific Comments  
March 18, 2005

Response Section

Page A-1 Emergency Contact Numbers for Department of Commerce should be:  
Department of Commerce/NOAA (business hours) 907 271-5006 or 907 586-7235  
(fax) 907 271-3030 or 907 586-7012  
(emergency) 907 248-4211 or 907 586-1637

Page A-2 Federal Agency Contacts

National Marine Fisheries Service: Phone 907 271-3023 Fax 907 271-3030  
Alternate Phone 907 586-7638

Page A-13 Response: Part Three – Response Procedures

Consider adding additional specificity that would encourage contacting chemists as soon as possible to collect background samples on the beach before the oil spreads and reaches the beach. This would shift some of the focus to the long-range resource perspective.

Consider adding the following language under A. Response Objectives:

3. Deploy chemists to collect early samples of tissue and sediment on the beach.

Resources Section (February 7, 2005 Version)

Page B-22 – Juneau Community Profile: Please include information on the resources and expertise available at the NMFS Alaska Fisheries Science Center (AFSC) Auke Bay Laboratory (ABL) in Juneau. Resources include: chemistry laboratory, hydrocarbon chemists, intertidal and seaweed specialists, statisticians, and marine fish specialists. The chemistry laboratory is among the leading laboratories analyzing the toxic fractions of crude oil in water, sediment, and animal tissues. ABL has oil spill related expertise in quantifying the persistence of oil in water, sediments, and animal tissues; toxicology of oil to marine fish larvae and salmon embryos; toxicology of oiled sediment to subtidal benthic organisms; and dispersant research.

We suggest using the following summary:

The Auke Bay Laboratory of the National Marine Fisheries Service, located in Juneau Alaska, has been at the forefront of international oil pollution research since 1971. Following early research evaluating the effects and toxicity of various types of oil to Alaskan fish and invertebrates, lab personnel conducted biological studies related to the Exxon Valdez oil spill. Field and laboratory research on oil has resulted in nearly 200 papers on the short and long term effects of oil on southeast Alaska aquatic organisms. This research refocused scientific scrutiny of oil spills from the acute effects of short-term exposures to the long-term ramifications following exposure of sensitive life stages to very low doses of oil.

Page B-92 (L) Laboratories

List the NMFS, AFSC, ABL. The contact information is:

National Marine Fisheries Service, Alaska Fisheries Science Center, Auke Bay  
Laboratory, 11305 Glacier Highway, Juneau, AK 99801-8626 Phone: 907 789-6020

Fax: 907 789-6094 [Jeep.Rice@noaa.gov](mailto:Jeep.Rice@noaa.gov) <http://www.afsc.noaa.gov/abl/>

For oil spill related information: <http://www.afsc.noaa.gov/abl/OilSpill/oilspill.htm>

This section refers to Annex E, Appendix III, Tab K of the Unified Plan, which does not list ABL. The laboratory information listed above should be incorporated when the Unified Plan is updated.

Page B-100 Federal Trustee and Emergency Contacts

Delete Brad Smith and his contact information.

Page B-108 Useful Websites

Add NMFS Alaska Fisheries Science Center Auke Bay Laboratory

<http://www.afsc.noaa.gov/abl/>

#### Hazmat Section

NMFS has no comments at this time.

#### Sensitive Areas Section (February 2005 Version)

Page D-2

The first sentence on this page "Section G of the Subarea Contingency Plan contains site-specific Geographic Response Strategies (GRSs) for use by responders in protecting key sensitive areas" is repeated as the last line of the third paragraph.

Page D-3 Initial Contacts/Fish and Wildlife Habitat

NMFS requests two rows of information.

The first row should be:

Agency - US Department of Commerce (DOC), National Marine Fisheries Service (NMFS), Alaska Region (AKR)

Resources – sea lions, seals, whales, endangered marine species, anadromous fish in marine waters, essential fish habitat

Primary Contact - Brad Smith

Alternate Contact - Jon Kurland

The second row of information under Fish and Wildlife Resources should be:

Agency - US DOC, NMFS, Alaska Fisheries Science Center, Auke Bay Laboratory

Resources – effects of oil on fisheries resources, hydrocarbon chemistry, dispersants

Primary Contact – Jeep Rice

Alternate Contact – Jeff Short

Page D-4 Commercial Harvests

List Brad Smith as the primary contact. List Jon Kurland as the alternate contact.

Page D-5 Initial Contacts/Subsistence, Personal, and Sport Uses  
List Brad Smith as the primary contact. List Kaja Brix as the alternate contact.

Page D-8 Contact Information

Primary Contact for NMFS AKR:

Brad Smith  
work: 907 271-3023  
fax: 907 271-3030  
emergency: 907 248-4211  
email: [Brad.Smith@noaa.gov](mailto:Brad.Smith@noaa.gov)

Alternate Contact for NMFS AKR:

Jon Kurland  
work: 907 586-7638  
fax: 907 586-7358  
cell: 907 321-4377  
emergency: 907 364-2396  
email: [Jon.Kurland@noaa.gov](mailto:Jon.Kurland@noaa.gov)

Additional Alternate Contact for NMFS AKR:

Kaja Brix  
work: 907 586-7235  
fax: 907 586-7012  
emergency: 907 586-1637  
email: [Kaja.Brix@noaa.gov](mailto:Kaja.Brix@noaa.gov)

Primary Contact Information for NMFS, AFSC, ABL:

Jeep Rice  
work: 907 789-6020  
fax: 907 789-6094  
emergency: 907 789-0867  
email: [Jeep.Rice@noaa.gov](mailto:Jeep.Rice@noaa.gov)

Alternate Contact for NMFS, AFSC, ABL:

Jeff Short  
work: 907 789-6065  
fax: 907 789-6094  
emergency: 907 789-0579  
email: [Jeff.Short@noaa.gov](mailto:Jeff.Short@noaa.gov)

Page D-13 Areas of Major Concern

Use only the word haulouts to describe where harbor seals pull out of the water. The term rookeries is not used for seals. Not all seal haulouts are a "Major Concern". Major designation is used for haulouts with greater than 50 seals. For "Harbor Seal Haulouts" please specify (greater than 50 seals).

Page D-14 Areas of Moderate Concern  
Add Harbor Seal Haulouts with 10 to 50 seals.

Page D-14 Areas of Lesser Concern  
Add Harbor Seal Haulouts with less than 10 seals.

Page D-18 Whales and Porpoises  
Delete the human harvest portion of the table or indicate no harvest. Whales and porpoises are never highly sensitive to oiling or response. Delete the information in the Most Susceptible box. Do not show anything in this category. Delete the calving timing information for whales and porpoises under Critical Life Periods.

Page D-35 Benthic Habitats  
Benthic habitats have lower vulnerability to oil than the intertidal zone, but contamination by floating slicks (dissolved and particulate fractions) is likely at depths less than 100ft. if oil remains in the area for several days. Areas continually exposed to floating oil (harbors) show accumulation of hydrocarbon fractions (PAH's) in sediments and biota at 100 feet depth. Kelp beds are susceptible to floating oil because the fronds of bull kelp reach near or to the surface, depending on tide stage. Eelgrass beds are also subject to oil exposure because of their proximity to surface spilled oil at low tide (a few feet) and their extension into the intertidal zone. Benthic submerged aquatic vegetation in or near intertidal zones is at risk by oil slicks.

Page D-36  
ESI #10  
Define flatness and permeability quantitatively as for other habitat types.

Shore Zone Mapping  
Rewrite the first and second sentence to read: An on-going coastal habitat mapping effort is producing an on-line database, digital maps, and color aerial imagery and videos of the coastline in the subarea. This geo-referenced data set collected at low tide includes coastal geomorphology and biological habitat for some intertidal and shallow subtidal areas.

Background: Some shore zone mapping was done in SE Alaska in 2004 and more is planned for 2005. Currently the information is located at [www.CoastAlaska.net](http://www.CoastAlaska.net). Discussins are being held to find a permanent "home" for the SEAK mapping data. Therefore, the web site location for this information will likely change in the near future. K Koski (AFSC ABL, 907 789-6024) and Rob Bosworth (The Nature Conservancy, 907 586-8621) have been actively working on this project and should be contacted for more information.

Eelgrass beds  
Suggest rewriting the first and second sentence to read: Eelgrass beds are a habitat of special concern. Eelgrass beds provide important habitat for fish and are susceptible to disturbance.

Page D-40 Eelgrass Sites

Note that this list is not based on a comprehensive survey of eelgrass, but is a list of sites selected for scientific study.

Page D-41 Eelgrass Sites Map

Note that this list is not based on a comprehensive survey of eelgrass, but is a list of sites selected for scientific study.

Page D-42 Change the sentence that reads “All salmon species and Steller sea lions are under the jurisdiction of the National Marine Fisheries Service, Northwest Regional Office, Seattle, Washington.” to read “Under the ESA, all salmon species, Steller sea lions, and endangered whale species are under the jurisdiction of the National Marine Fisheries Service.”

Page D-43 Species Managed by the National Marine Fisheries Service

For humpback whale list that it is seasonally present instead of listing it as a resident. Only a few humpback whales remain in southeast Alaska over winter.

The correct genus and species for Northern right whale is: *Eubalaena japonica*.

Page D-44 Steller Sea Lion Rookery & Haulout Locations

Dray Bay should be Dry Bay.

Note that since Steller sea lion Critical Habitat was designated in 1993, two more rookeries were designated in Southeast Alaska, Graves Rock and Biali Rock as of 2002. Graves Rock and Biali Rock are rookeries and haulouts with >200 animals, therefore both need to have footnote 1 and 2. The table should also note that they were added as rookeries in 2002 to avoid confusion if someone compares the rookery list in the regulations for critical habitat and the list in the subarea plan.

Page D-46 Finfish

Extra emphasis should be placed on the importance of estuaries and river deltas during spring and fall. Estuarine areas and river deltas provide important habitat during the spring and fall migration periods. Estuaries also provide important summer habitat for juvenile anadromous fish, but are generally not used during the winter.

Page D-47 (b) Fish

Rename the section to reflect its contents, e.g., Finfish, Shellfish, and Essential Fish Habitat

Page D-47 Eulachon

The Antler and Lace Rivers in Berners Bay both have significant migrations of eulachon.



#### Page D-48 Grounfish

Juvenile pollock, greenlings, pricklebacks, and sculpins make up a significant portion of the diet of species such as salmon and marine mammals.

Yellowfin sole and starry flounder also spawn in shallow subtidal areas of bays and estuaries.

Grounfish managed by the North Pacific Fishery Management Council in the Gulf of Alaska include: walleye pollock, Pacific cod, sablefish, dover sole, Greenland turbot, deep-sea sole, rex sole, southern rock sole, yellowfin sole, starry flounder, butter sole, English sole, Alaska plaice, sand sole, flathead sole, arrowtooth flounder, 30 species of rockfish with emphasis on shortraker and roughey rockfish, and Pacific Ocean perch. Also listed as important are: pelagic shelf rockfish including: northern, dusky, widow, and yellowtail rockfish; demersal shelf rockfish including: canary, China, copper, quillback, rosethorn, tiger, and yelloweye rockfish; and a deepwater assemblage of shortspine thornyhead, and longspine thornyhead rockfish. Atka mackerel is a groundfish that is sometimes found in southeast Alaska.

A 1982 report by Carlson, Haight and Krieger titled "Species Composition and Relative Abundance of Demersal Marine Life in Waters of Southeastern Alaska" lists species caught while bottom trawling in southeast Alaska. Minor species such as sculpins, poachers, etc. are listed in addition to major FMP species.

The Johnson, Neff and Thedinga NOAA technical memo (now in draft and available soon) will list the 50 most abundant fish species captured in 538 beach seine hauls at 41 locations in southeastern Alaska from 1998 to 2004. This will be a good reference for detailed information on the species of fish utilizing nearshore habitats in southeast Alaska. Fish species most vulnerable to an oil spill would be those with life stages that utilize nearshore tidal habitat, such as:

Forage fish: Pacific herring, Pacific sand lance, Arctic shanny, crescent gunnel, snake prickleback, Pacific sandfish, and surf smelt.

Groundfish: Walleye pollock, Pacific cod, rock sole, yellowfin sole, starry flounder, English and butter sole, and copper, dusky, brown, black, and quillback rockfishes.

Salmon: pink, chum, and coho salmon.

#### Page D-48 Shellfish

Include a general reference to crustaceans (includes shrimp and crabs). They are referred to later in the text but their overall importance is unacknowledged. For example, larvae and adults of this subphylum predominate in the zooplankton and are important in the diet of species ranging from forage fish to baleen whales.

King crab do not have a "decreasing reliance on habitat." Their habitat uses simply change as they grow, from only areas with structural cover to areas where pod behavior protects them from predation.

Page D-49 Three species of king crab are located in Southeast Alaska: red, blue, and brown.

This section uses a mixture of meters and feet. Use consistent units to describe preferred habitat.

Page D-50 Tanner Crab

Mating aggregations occur at depths less than 100 feet.

Page D-50 Scallops

Bay scallops occur shallower than weathervane scallops (50- 200 ft.). They are easily collected by divers and are frequently harvested in this manner. They are more vulnerable to oil exposure than weathervane scallops as adults

Page D-54 Marine Mammals

Humpback Whales

Change the text that reads “More than 500 humpbacks may now be found in Southeast Alaska during summer according to recent studies (ADF&G 2003c). Some humpback whales are present year-round.” to read “The most recent abundance estimates indicate that nearly 1,000 humpback whales may be found in southeast Alaska north of Chatham Strait (Straley et al. 2002). Some humpback whales are present year-round, in areas such as Sitka Sound and Lynn Canal.”

Add: “In southeast Alaska, humpback whales show a high degree of site fidelity to feeding areas such as Frederick Sound, Chatham Strait, North Pass, Sitka Sound, Glacier Bay, and Icy Strait. Humpback whales in these regions feed primarily on herring, juvenile walleye pollock, capelin, sandlance, and krill.”

Harbor Seals

Remove reference to “rookeries” for harbor seals, as this term is not used for this species.

The Steller Sea Lion

Last sentence of Steller sea lion, 1st paragraph there is a typo...species.

Replace second paragraph with the following text:

Seasonal movements occur generally from exposed areas in summer to protected areas in winter. Steller sea lions can move over long distances. Please see map below for further Steller sea lion critical habitat delineations. Large concentrations of Steller sea lions haul out at Benjamin Island, Biali Rock, Biorka, Cape Addington, Cape Cross, Cape Ommaney, Coronation Island, Gran Point, Ledge Point, Lull Point, Sunset Island, and Timbered Island. Sea lion rookeries occur on Hazy Island, White Sisters, Biali Rock, Graves Rock, and Lowrie Island, Cape Horn Rocks, North Rock and Sea Lion Rock in the Forrester Island Complex. Rookeries can also be used as haulouts outside the breeding season.

Pages D-56 & D-57 Harbor Seal Maps

NMFS finds the included maps to be appropriate, which use ADF&G data to spatially portray harbor seal haulout locations. Less than 50 seals can be considered low to moderate risk, and greater than 50 seals can be considered high risk.

Page D-58 Sitka black-tailed deer

During heavy snow years, deer use the intertidal areas to feed on fucus and various macroalgae.

Pages D-59 & D-60 – References for biological resources

Add: Straley, J.M., T.J. Quinn, and C.M. Gabriele. 2002. *Estimate of the abundance of humpback whales in southeastern Alaska 1994-2000*. Rept. To NMFS, NMML, Grant No. G00000756, SFOS02-223, Seattle Washington, October 2001. 22pp.

Add: Carlson, H.R, R. E. Haight, R.E. and K.J. Krieger. 1982. *Species composition and relative abundance of demersal marine life in waters of Southeastern Alaska, 1969-81*. NWAFC Processed Report 82-16. 106 p.

NMFS AFSC ABL will soon have a technical memo available titled “An Atlas on the Distribution and Habitat of Common Fishes in Shallow Nearshore Waters of Southeast Alaska” by Scott W. Johnson, A. Darcie Neff and John F. Thedinga. For further information on this atlas contact Scott Johnson at [scott.johnson@noaa.gov](mailto:scott.johnson@noaa.gov) or 907 789-6063. This reference should be listed. Until this document is published it can be referenced as: Johnson, S.W., A. Darcie Neff and John F. Thedinga. *An atlas of the distribution and habitat of common fishes in shallow nearshore waters of southeastern Alaska*. Unpublished.

Pages D 66-68 Biological Hotspots/Most Environmentally Sensitive Areas

NMFS recommends adding the following areas as environmentally sensitive in SEAK:

Berners Bay for its high seasonal concentrations of eulachon, herring, salmon, capelin, Steller sea lions, and harbor seals. Berners Bay appears to be some of the only, if not the only, spawning habitat used by the severely depressed stock of Lynn Canal herring. In addition, Berners Bay is the only region in SEAK where Steller sea lions have been observed engaging in coordinated foraging activity in groups ranging from 75-300 animals (close to 1,000 have been observed in the Bay at one time during April and May.)

Frederick Sound and Point Adolphus (mouth of Glacier Bay) are important foraging areas for concentrations of humpback whales.

Tracy Arm and Endicott Arm are important areas of concentration for harbor seals that rely on ice flows for pupping and hauling out, and for seabird nesting colonies (pigeon guillemots, kittiwakes).

Brothers Islands in Frederick Sound are important areas of concentration for Steller sea lions (haulout with 1,500 animals), salmon, forage fish (herring, sandlance, sandfish), and seabirds and is a humpback whale feeding area.

Benjamin Island in Lynn Canal is an important Steller sea lion haulout (major one in northern inside waters of SE Alaska with 800 animals) and an area of concentration for sponges and rockfish.

Steller sea lion haulouts and rookeries that are not already listed include: Benjamin Island, Biali Rock, Biorka, Cape Addington, Cape Cross, Cape Ommaney, Gran Point, Legde Point, Lull Point, Sunset Island, Timbered Island, White Sisters and Graves Rock.

Page D 101 – subsistence and personal use harvest

NMFS recommends adding the following:

NMFS and the Alaska Native Harbor Seal Commission (ANHSC) entered into a co-management agreement in 1999 to cooperatively manage harbor seal populations in Alaska. The purpose of the agreement was to set forth an operational structure for the conservation and management of harbor seals to maintain population levels that allow for sustainable subsistence use by Alaska Natives while carrying out the goals of the Marine Mammal Protection Act to maintain harbor seals as significant functioning elements of the ecosystems upon which they depend. This partnership and management structure relies on shared decision-making based on consensus to promote the sustained health of harbor seals, to promote scientific research, to identify and resolve conflicts, and to provide information to harvesters and the public on the management and conservation of harbor seals.

Subsistence takes of harbor seals and Steller sea lions in Alaska have been documented by ADF&G's Division of Subsistence since 1992. Harvest information has been derived from interviews with hunters and marine mammal users in coastal communities as a collaborative project between ADF&G and Alaska Native hunters and organizations. During 1995-97, 3,750 harbor seals (with reported sex) were harvested in southeast Alaska; in 2000, 1,361 harbor seals were taken through subsistence harvest in this region. The number of seals taken by Alaska Natives in southeast Alaska consistently remains higher than the number taken in the Gulf of Alaska and the Bering Sea; in 2000, this take was about 61% of the statewide total. In 2000, harbor seals were harvested during every month of the year with seasonal hunting peaks in February-March and September through December.

The most significant Steller sea lion subsistence harvest occurs in the Pribilof Islands and Aleutian Islands. In 2000, kills were reported in every month, peaking in May and October. Harvest tends to be very low in southeast Alaska; in 2000, 2 sea lions were taken by harvest in this region, representing 1.1% of the state total.

#### Background Section

Page E-8 Subarea Committee Members

Keep the National Marine Fisheries Service listed as an agency that provides advice and expertise to the Southeast Subarea Committee.

### Scenarios Section

This material was written in 1997 and has not yet been updated to incorporate knowledge gained from the Exxon Valdez oil spill. The bulk of the informational material may not have changed substantially since 1997, such as where booms are stored or even where they should be deployed. The information on fisheries and damage prevention technology needs to be updated.

Enclosed for reference is a white paper titled "Factors Affecting the Chronic Effects of Polycyclic Aromatic Hydrocarbons on Aquatic Organisms." The paper was written by AFSC ABL scientists as a resource for NMFS staff and may be useful to Rob Nakama who is responsible for updating this section. The paper is a recent overview of experience since the Exxon Valdez spill in 1989. Questions on this paper should be addressed to Adam Moles at [adam.moles@noaa.gov](mailto:adam.moles@noaa.gov) or 907 789-6023.

Specific examples of changes needed to the Scenarios Section:

On F-2 the authors state: "the first objective of this response should be to bring the spill ashore as soon as possible." Long-term ecological damage to fisheries resources resulted from Exxon Valdez oil reaching the shore where it became incorporated in subsurface sediments for over a decade. Animals that have not recovered from the spill are those that are associated with the intertidal sediments of heavily oiled beaches in Prince William Sound. The best strategy would be to prevent the oil from reaching the shore. For example, seabirds forage on intertidal invertebrates and may feed on beaches that would be classified as non-critical because they contain only oil-tolerant invertebrates. Such beaches may serve as reservoirs for bioaccumulated oil that is in turn passed up the food chain for generations.

On F-3, washing the beaches is listed as a viable recovery method. Many of these methods resolubilize the oil, returning it in toxic concentrations to the water column. In many cases during the Exxon Valdez response, washing the beaches made the problem worse by damaging the beach animals and altering the oil. This section should mention the potential damage to the resource, the health concerns for the cleaners, and the probability of increasing the amount of oil that gets resolubilized or driven into beach sediments. NMFS suggests making it clearer that the type of habitat, life stage, and oil will have major impacts on response strategies.

On F-12, in the disposal section, the authors imply that natural vaporization will eliminate some of the oil product. This gives the impression that natural weathering will make the beached oil less of a problem. Weathered oil is actually far more persistent and toxic than unweathered oil. Note should be made that the rest of the beached product can remain trapped in subsurface sediments. In the long run, the PAH fraction is the most toxic portion of the oil, not the BTEX.

On F-13, under resources at risk, the author says there is only scattered information about resources at risk. This has changed since 1997. The Sensitive Areas Section covers this question and prioritizes habitats very well. Although there is still much to be learned, this section of Scenarios should reference the Sensitive Areas Section and then discuss what makes intertidal habitat so vulnerable to oil. In addition, the resources at risk focus on fish. What about seabirds or mammals that are far more likely to be coated?

Dispersant use should be added to this section with a table showing how long it would take to get dispersants to different locations in Southeast Alaska.

The text should discuss the relative feasibility for each scenario.

#### Geographic Response Strategies

NMFS has no comments at this time.

## References

Johnson, S.W., A. Darcie Neff and John F. Thedinga. *An atlas of the distribution and habitat of common fishes in shallow nearshore waters of southeastern Alaska.* Unpublished.