

Report Series J: Marine Nearshore Fish and Benthic Invertebrates

This release, Marine Nearshore Fish and Benthic Invertebrates, is the tenth in the Pebble Partnership's Pre-Permitting Environmental and Socio-Economic Data Report series. Nearshore fish include those found from the high tide line through the shallower waters of the study area, and includes both demersal (on or near bottom) and pelagic (water column) species. Benthic invertebrates are those living near, on, or within bottom sediments.

Since 2004, the Pebble Partnership has retained independent environmental consultants and laboratories to conduct marine studies in Iliamna Bay and Iniskin Bay. Data were gathered by Pentec Environmental/Hart-Crowser Inc., Bristol Environmental and Engineering Services Corporation, University of Alaska Fairbanks (UAF), and RWJ Consulting.

This release includes data pertaining to the benthic and nearshore communities of Iliamna Bay and Iniskin Bay. Similar to the Marine Nearshore Habitat release, the study area includes nearshore marine waters and shorelines from the east entrance of Iniskin Bay and Scott Island to the south entrance of Iliamna Bay at South Head and encompasses areas under consideration for a new port site and access road. The objectives of the Marine Nearshore Fish and Benthic Studies are:

- to build upon the considerable knowledge available from past studies to document baseline conditions, including seasonal, annual and tidal variations, as well as elevation;
- to document the food web and ecological relationships among key species in the areas studied;
- to investigate Pacific herring spawning;
- to identify and map specific habitats and/or resources (e.g., kelp and eelgrass beds, marshes at stream mouths, shellfish resource areas, etc.)

The information presented here was gathered between 2004-2007 and builds upon studies that began in the 1970s by the same lead investigators. Field work completed for the Pebble marine studies included:

- aerial reconnaissance (including mapping and remote sensing)
- intertidal reconnaissance;
- intertidal sampling;
- beach seining;
- subtidal reconnaissance (diving);
- subtidal sampling; and
- trawl sampling.

Study Summary

Generally, the intertidal areas sampled represent a wide range of habitat types from bedrock to mudflat. Each habitat type supports a distinct mix of resident organisms that have adapted to the physically rigorous environment in Iliamna Bay and Iniskin Bay. The intertidal zones' plant and animal diversity tends to decrease in areas that are protected from wave action and have relatively high suspended sediments. Ice damage and low light levels combine to greatly reduce intertidal organisms each winter, with the effects of moving ice exacerbated by ocean swells. Organisms may overwinter as ice-resistant holdfasts,



Sea anemone (Urticina crassicornis) and typical cobble/boulder habitat near North Head.

in crevices or under boulders, or by migrating to subtidal areas; these species recolonize the intertidal zone each spring as light levels increase and ice dissipates.

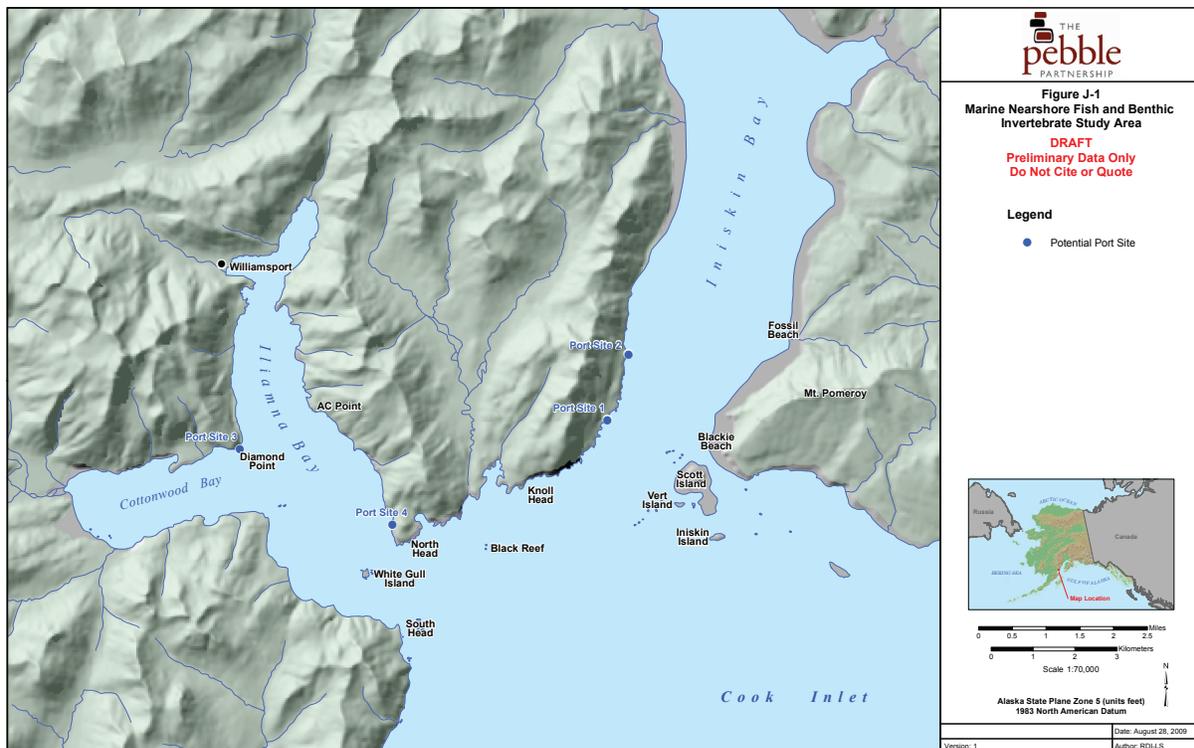
In general, the studies indicate that subtidal plant and animal assemblages are more abundant and more diverse than are those in the intertidal zone. These differences reflect the greater stability and lower stress of subtidal environments, compared to intertidal environments where wave action, large temperature and salinity shifts, and seasonal ice gouging exert stronger influence.

Benthic organisms at the shallowest depths tended to be relatively sparse. Soft substrates in the subtidal zones are dominated by burrowing organisms, mainly tube-dwelling suspension feeding worms while rocky or coarse substrates are dominated by attached or mobile organisms. Common attached invertebrates include sponges, hydroids, sea anemones, and bryozoans. Common mobile invertebrates include species of snails, chitons, nudibranchs, crabs and sea-stars. Few bottom-dwelling (demersal) fish were observed on dive transects, while bottom-oriented fish such as the whitespotted greenling, starry flounder, and juvenile flatfishes are relatively common in the trawl catches.

The nearshore zones of Iliamna and Iniskin bays are used seasonally by numerous species of fish and macroinvertebrates as rearing areas, migration corridors, and places of refuge from deepwater predators. The number of species and total numbers of fish in the nearshore community expands from late-April through July, declining somewhat in August, increasing somewhat in September, and declining again by October. Abundance data clearly indicate that the most prevalent fish use of the shoreline areas is as a nursery for juvenile salmon and, on occasional years, juvenile Pacific herring.

Offshore sampling by bottom trawl revealed a substantially different fish community than that found in the nearshore. More than 30 species of fish were observed but, like the nearshore community, this assemblage was dominated by just a few species, Yellowfin sole and snake prickleback combined to make up more than 60% of all fish captured in the trawl.

Generally, there are relatively few invertebrates in beach seines, with the exception of occasional high catches of mysids (a type of shrimp) in inner Iliamna Bay. In contrast, trawl sampling captured numerous macroinvertebrates. In 2005, 2006 and 2007, more than 80 species were captured, with pandalid, cragonid and hippolytid shrimp species making up approximately 80% (by number) of all invertebrates caught in these sampling events.



***Preliminary data only. Do not cite or quote.**

The Marine Nearshore Fish and Benthic Invertebrate data report, released as part of the Pebble Partnership's Pre-Permitting Environmental & Socio- Economic Data Report Series, are available online at www.pebblepartnership.com.