

Fig. 1 - Location map of study.

MARINE LIFE ABUNDANT NEAR SITE OF PROPOSED ALASKAN MILL

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Numerous marine organisms--many of commercial importance--were observed by biologists of the National Marine Fisheries Service Auke Bay Fisheries Laboratory on a recent survey near Juneau at Echo Cove, the site of a proposed large pulp-and-lumber mill (Fig. 1). The biologists worked from the research vessel 'Murre II' and used three techniques to sample marine life: underwater time-lapse photography, observations by divers, and fishing with a bottom grab sampler. Scientists from the State of Alaska Department of Environmental Conservation also participated in the survey. They collected geological information on bottom sediments.

A series of photographs was taken over an 18-hour period with a stationary underwater camera-strobe system in 210 ft. of water at the site of the proposed location of the mill effluent outfall. The camera system was mounted on a quadrupod (described in Commercial Fisheries Review, Vol. 29, No. 1). The photographic target area was a sheet of plywood baited at the center with herring. Yellowfin sole; king, Dungeness, and tanner crabs; and pink shrimp were attracted to the bait. In addition to documenting the presence of these species, the serial photos, taken at half-hour intervals, disclosed differential behavior among the species attracted to the bait in the camera's view.

Yellowfin sole appeared first, shortly after the camera was in position at 1:30 p.m. (Fig. 2A). Dungeness crabs appeared between 3:30 and 4 p.m. (Fig. 2B). By 8 p.m., most of the sole had left the area (possibly displaced by the Dungeness crabs) and a

few pink shrimp began to appear (Fig. 2C). Tanner crabs were abundant at 10 p.m. (Fig. 2D), and shrimp became more abundant during the night--from 10:30 p.m. until 7:30 a.m. (Fig. 2E), when the experiment was completed. King crabs such as the one photographed at 2:30 a.m. (Fig. 2F) appeared occasionally.

Behavioral Differences

The sequence of photographs demonstrated behavioral differences between species of larger mobile benthic animals. The shrimp may have been inhibited from approaching the bait while the sole were present because of the threat of predation by the fish--or because of effects of daylight and darkness on general activity. The sole were displaced by the crabs, but the shrimp were not inhibited by the presence of crabs. Perhaps the shrimp temporarily benefited from the presence of the crabs by receiving protection from the fish and, thereby, access to the food.

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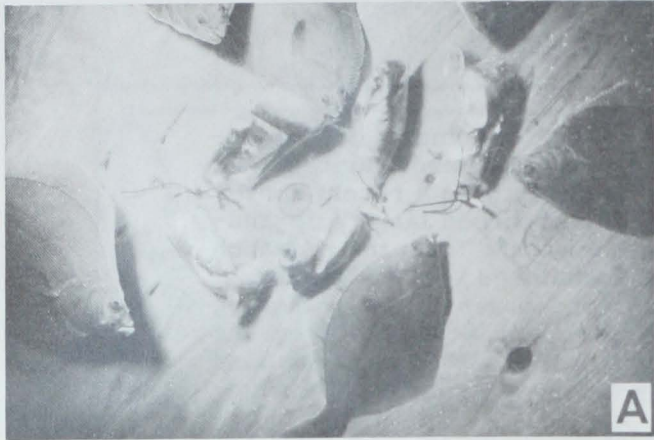


Fig. 2 - Selected photographs from series taken over an 18-hour period with a camera-strobe system.

Biologists-Divers

A four-man team of biologists-divers also made 13 dives in the Echo Cove vicinity (shaded areas of Fig. 1) in depths to 100 ft. They found abundant populations of invertebrates. Molting and mating tanner crabs were common throughout the area. Several hundred maturing female king crabs were concentrated just outside Echo Cove--an indication that the area may serve as a mating area for this species later in the season as adult males migrate shoreward from deep water. Adult male Dungeness crabs were found just inside the narrows at the entrance to Echo Cove. Juvenile pink and humpy shrimps were very abundant in several areas. Sea urchins, anemones, clams, and many other invertebrates were especially abundant at the entrance to Echo Cove. The strong currents through the narrows probably contribute to the high biological productivity of this area.

Bottom Samples Collected

Bottom samples were collected by a grab sampler at several locations in 90 to 630 ft. of water. Burrowing animals were abundant, particularly in Echo Cove and the adjacent areas of Berners Bay. Surprising and significant was the capture of several adult sand lances in two of the bottom samples near the sandspit where Echo Cove joins Berner Bay. The grab sampler is not designed to capture fish and only a few square inches of bottom surface area are collected in each sample; therefore, the sand lances may be very abundant. A high abundance of these small forage fish would help explain why large numbers of salmon, trout, halibut, seals, sea lions, whales, eagles, gulls, and diving birds are often observed in the Echo Cove area.

Periodic surveys of the marine environment at Echo Cove will be continued to predict the environmental impact of the mill on the marine environment, especially the commercial species of fish and shellfish, and to provide baseline data for comparisons after the mill is built.

