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CHIGNIK SMALL BOAT HARBOR

Planning Aid Report

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Submitted to:
Alaska District
U.S. Army Corps of Engineers
Anchorage, Alaska

Prepared by: Marian Zimmerman, Fishery Biologist
Approved by: Robert Bowker, Field Supervisor

U.S. Fish and Wildlife Service
Western Alaska Ecological Services
Anchorage, Alaska

September, 1984

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INTRODUCTION: Study of a small boat harbor at Chignik, Alaska, under Section 107 authority has been on-going for several years. In May, 1983, reconnaissance level studies of intertidal benthos and near shore fisheries were conducted. Cursory inspections of two potential quarry sites were also made. Based on these investigations, data gaps were identified regarding benthic composition in the lower intertidal zone, near shore salmon use, raptor and kittiwake nesting, and wetland utilization by fish and wildlife.

In an effort to obtain information addressing these data gaps, field investigations were undertaken by Corps of Engineers and Fish and Wildlife Service biologists from 13 May to 18 May 1984. Data were collected from two harbor sites, a stream between these sites, Indian Creek Slough, and a new quarry site located near the cemetery at the head of Anchorage Bay (Figure 1).

PROJECT DESCRIPTION: Two alternatives for a small boat harbor site with associated staging and parking areas, sites 2 and 3 identified in the 1981 Reconnaissance Report, are currently being studied. Site 3, the Corps of Engineers' preferred alternative, is located just north of the Peter Pan cannery and immediately adjacent to the airport road. This site would have a 4.8-acre mooring basin and a 3.7-acre entrance and maneuvering channel. The entrance channel would be dredged to -17 ft mean lower low water (MLLW). The north end of the harbor would have a deep draft mooring area and maneuvering channel dredged to -16 ft MLLW while the southern portion would have a medium draft mooring area and maneuvering channel dredged to -10 ft MLLW. Breakwater dimensions have not yet been calculated, but several acres of subtidal habitat will be filled. The staging and parking area would cover 2 acres of the intertidal zone. All together, 15-20 acres of inter- and subtidal habitat would be directly impacted by a boat harbor at this site.

Plans for site 2 are less detailed at the time of this writing. This alternative, which is located closer toward the airport, would have a mooring basin, entrance and maneuvering channel, and breakwater together occupying roughly 15 acres of inter- and subtidal habitat. A 4-acre staging and parking area would be developed in the freshwater wetlands adjacent to the harbor site.

Dredge spoil volumes resulting from developing the mooring basin and entrance and maneuvering channels have not been calculated for either harbor site alternative. Crude estimates made before hydrographic data were available indicate 21,000 yd^3 of bottom sediments would need to be spoiled. Present plans call for these materials to be used to create staging and parking areas in either intertidal or wetlands habitats adjacent to the harbor sites.

The preferred quarry site is located at the head of Anchorage Bay near the cemetery. If the rock proves suitable for breakwater construction, the site would be accessed by barge. This would necessitate the construction of a staging area that would probably intrude into the intertidal zone. The possibility of dredging to access the site has not yet been examined.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Western Alaska Ecological Services
605 W. 4th, Room G-81
Anchorage, Alaska 99501

IN REPLY REFER TO:
WAES

Colonel Neil E. Saling
District Engineer - Alaska
Corps of Engineers
Pouch 898
Anchorage, Alaska 99506

Dear Colonel Saling:

Enclosed is our Planning Aid Report which pertains to the environmental assessment of the proposed Chignik Small Boat Harbor. The report was prepared in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), but does not constitute the report of the Secretary of the Interior within the meaning of Section 2(b) of the Act, nor does it constitute consultation required under Section 7 of the Endangered Species Act (87 Stat. 884, as amended). The purpose of the report is to provide planning information to assist in small boat harbor development at Chignik, Alaska.

We appreciate the opportunity to contribute to this planning effort and look forward to continued close coordination. Please review this report and provide written comments within 30 days.

Sincerely,

Robert Bowker

Field Supervisor

Enclosure

cc: ADFG, Anchorage
NMFS, Anchorage

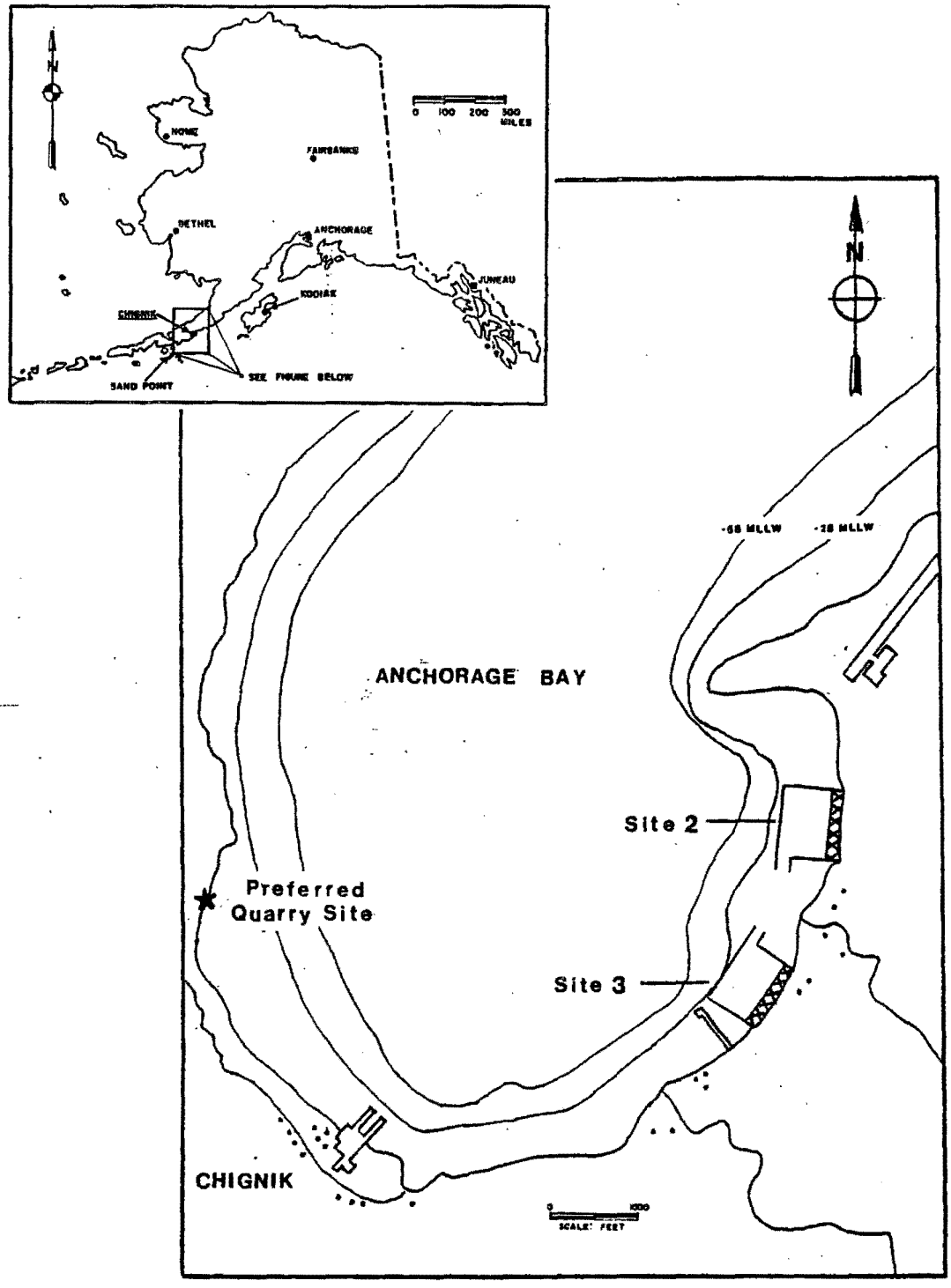

Figure 1. Chignik Small Boat Harbor alternatives and preferred quarry site.

METHODS: Two transects across the intertidal zone at each harbor site and one transect at the new quarry site were sampled from the approximate mean high water mark to the water's edge at low tide. Predominant epifauna and substrate conditions were recorded along the transects. Epifauna and infauna were identified and, when possible, quantified within 0.25 m^2 quadrats which were dug to an approximate depth of 0.3 m and located at 75 ft intervals.

Fish using near shore habitat within the two boat harbor sites were sampled with a beach seine (80 ft x 6 ft x 1/4 in mesh) and a lampara seine (250 ft x 20 ft x variable mesh). Beach seining was conducted at midday and early evening in an effort to observe any diurnal differences in fish use. In all cases, however, seine hauls were made during low tide, as boulders in the mid- and upper intertidal zone at harbor site 3 precluded use of this gear at higher tides. Lampara seining was conducted during mid-afternoon and early evening; flood, ebb, and high tides were sampled with this equipment.

The wetlands area adjacent to harbor site 2, the stream between harbor sites 2 and 3, and Indian Creek Slough were sampled for fish using baited minnow traps set overnight. A fyke net was also set overnight in the creek between the harbor alternatives. Bird and wildlife sitings were made throughout the project area, with special efforts made in the vicinity of the wetlands adjacent to harbor site 2 and the preferred quarry site.

FISH AND WILDLIFE RESOURCES: Biota along all the intertidal transects show patterns of zonation that correspond to substrate and elevation (Figures 2 and 3). The upper intertidal zone of harbor site 3 has a boulder/cobble substrate which supports more diverse biological assemblages than the sand/gravel substrate of harbor site 2. The lower intertidal and subtidal areas of both harbor sites have predominately sand bottoms and support, what appear to be, similar biological communities; differences between the two sites seem to be more a matter of relative abundance of organisms than of species composition.

At harbor site 2, the upper intertidal zone is largely devoid of flora and fauna. Somewhat lower, below the sharp break in slope of the beach, low densities of polychaetes (*Nereis* and *Nephtys*) occur. They become more abundant toward the lower intertidal zone and are represented by additional genera (*Glycera*, *Owenia*, and *Pectinaria*). Balthica macomas (*Macoma balthica*), common in the same quadrat in which polychaetes were first noted, are widely distributed throughout the mid-intertidal zone. Other bivalves, including Nuttall's cockles (*Clinocardium nuttallii*), bent-nose macomas (*Macoma nasuta*), Pacific littleneck clams (*Protothaca staminea*), soft-shell clams (*Mya truncata*), and butter clams (*Saxidomus gigantea*) occur in low to moderate densities in this zone and seem to increase in abundance toward the lower intertidal zone. Barnacles (*Balanus glandula* and *B. cariosus*) and blue mussels (*Mytilus edulis*) live on widely scattered boulders in the mid-intertidal zone; the lack of rocky substrates limits their abundance at this site.

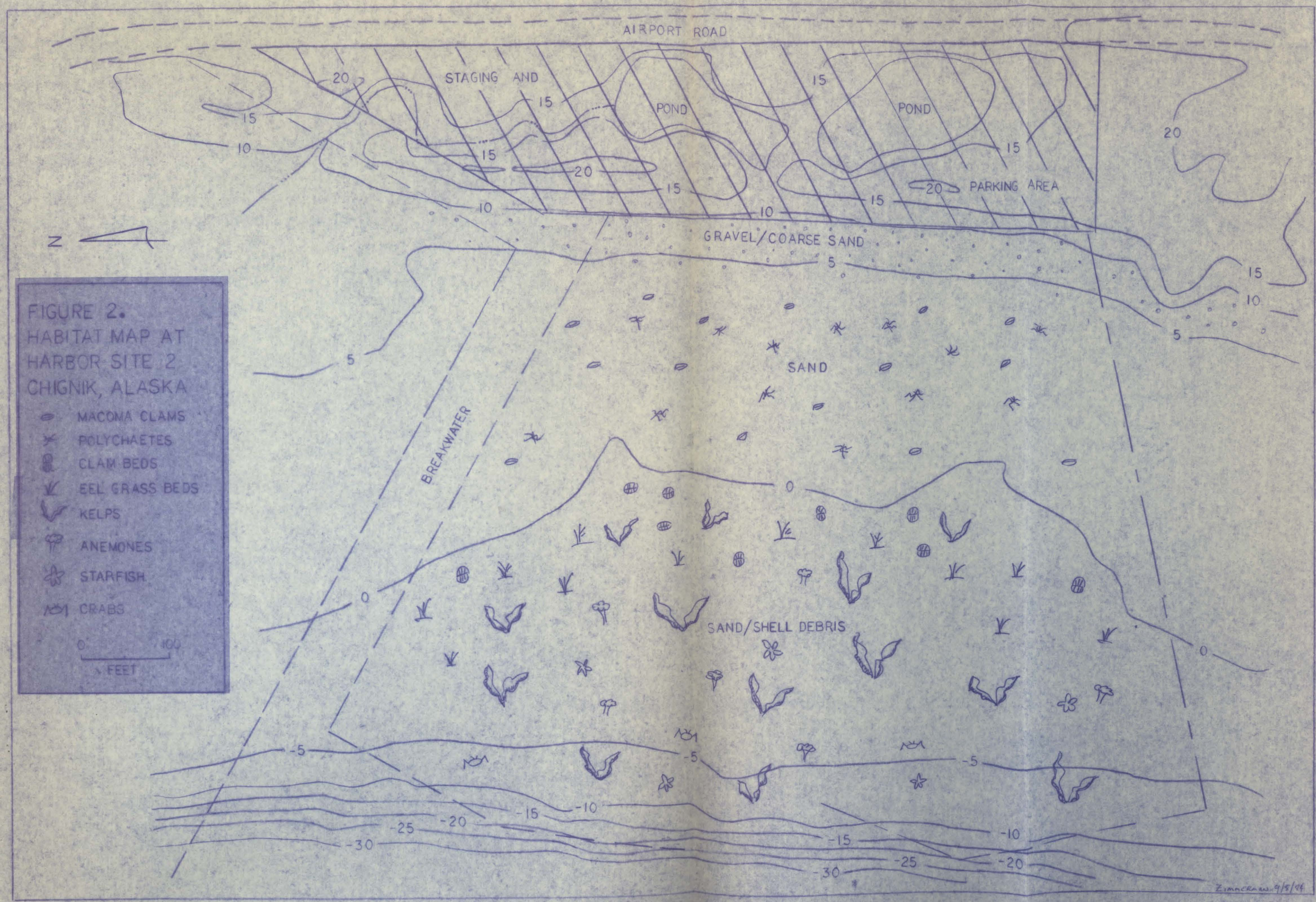

FIGURE 2. HABITAT MAP AT HARBOR SITE 2 CHIGNIK, ALASKA

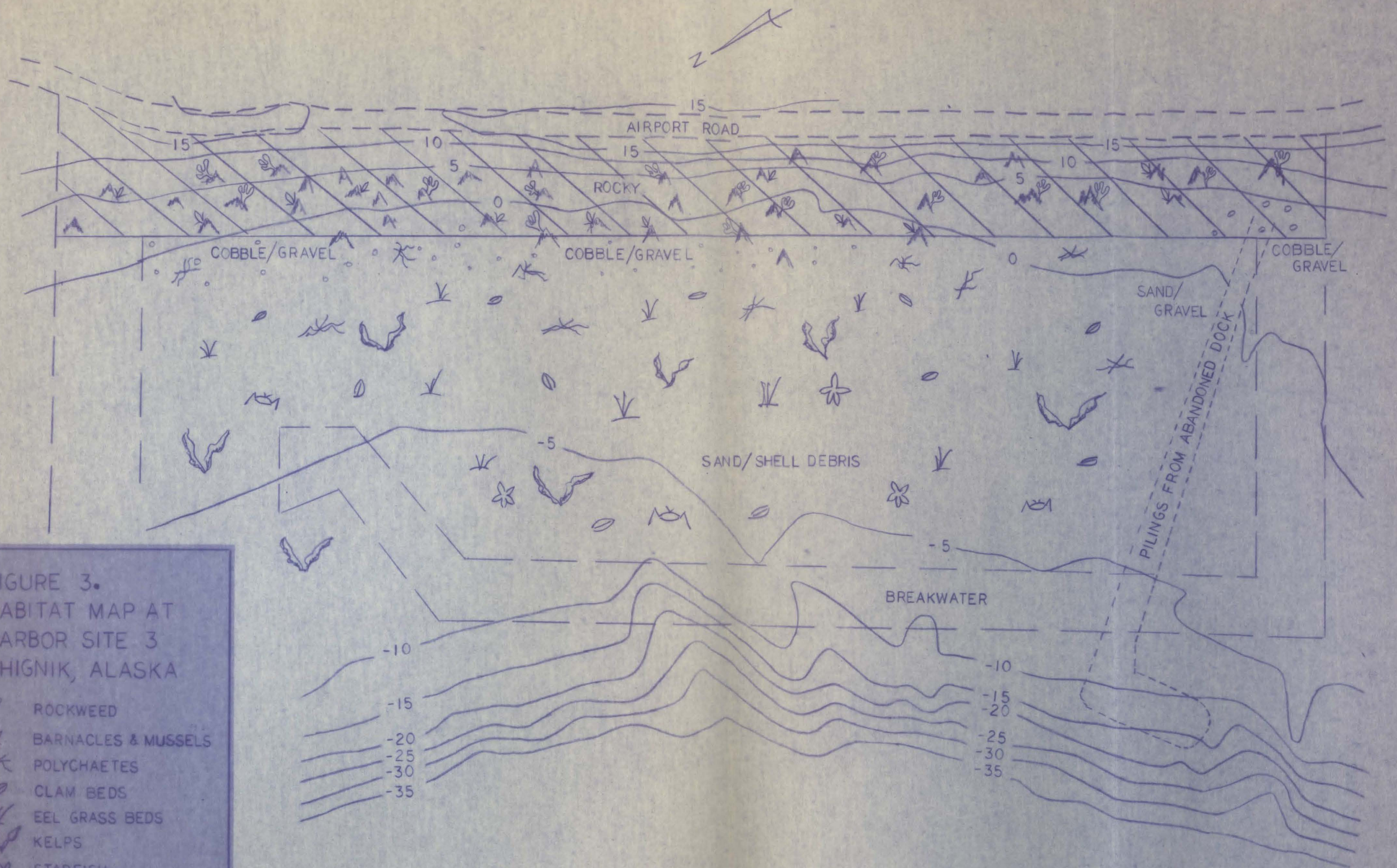

FIGURE 3.
HABITAT MAP AT
HARBOR SITE 3
CHIGNIK, ALASKA

Zimmerman 9/8/94

Toward the mean lower low water line, patches of eel grass (Zostera marina) and several species of marine algae including Cladophora, Monostroma, beauty bush (Callithamnion pikeanum), and red rock crust (Lithothamnium) become increasingly abundant and form moderately dense stands in some subtidal areas. Hermit crabs (Pagurus), juvenile dungeness crabs (Cancer magister), and sea anemones (Anthopleura artemisia) were noted in the lower intertidal zone and, undoubtedly, occur subtidally (Figure 4).

The boulder and cobble reaches of the upper intertidal zone at harbor site 3 are inhabitated by periwinkles (Littorina sitkana), limpets (Acmaea), blue mussels, and barnacles. Moving towards the water, a mixture of marine algaes occur and together form a very prominent band. The most common include Cladophora, Monostroma, wing kelp (Alaria), rockweed (Fucus), whip tube (Scytosiphon lomentaria), red rock crust, black pine (Rhodomela larix), sugar wrack (Laminaria saccharina), and several unidentified species. Eel grass beds were interspersed with the algaes.

Polychaete holes were first noted in the vicinity of these algaes and quadrat samples indicated that these were occupied by Nereis, Nephtys, Glycera, Owenia, and cone worms Pectinaria. They extended to the water's edge where sampling was stopped. The benthic community within the mid- and lower intertidal zones also had chitons (Tonicella lineata and Mopalia), puppet margarites (Margarite pupillus), channeled dogwinkles (Nucella canaliculata), periwinkles, and bivalves including bent-nose macomas, Pacific littleneck clams, soft-shelled clams, and butter clams. Hermit crabs, juvenile dungeness crabs, and crescent gunnels (Pholis laeta) live on and among the rocks (Figure 5).

Situated at the base of shear cliffs, the intertidal zone adjacent to the preferred quarry site consists of a steep, narrow band of rocky intertidal habitat. The biological community here is similar to that at harbor site 3, although more compressed due to the steeper slope (Figure 4). Fewer species of algae were observed, but some additional invertebrates were recorded, all of which are known to occur in the vicinity of the harbor sites. These included gammarid amphipods, isopods (Idothea), and an encrusting sponge (Figure 6). No data were collected subtidally at this site since adverse weather conditions precluded observations from the surface.

Nine species of fish were sampled at harbor sites 2 and 3 combined using a beach seine (Table 1). Of these, only rock sole (Lepidosetta bilineata) and buffalo scuplin (Enophrys bison) were common to the two sites. Five species including juvenile sockeye (Oncorhynchus nerka) and chum salmon (O. keta) were collected only at site 2 while two species were netted only at site 3. These differences could be due to limited sampling effort at site 3, since the gear could be used effectively only at low tide, and the fact that all sampling there was conducted prior to the appearance of salmon in the catch for either the beach or lampara seines.

Lampara seining yielded 12 species of fish including seven species which were not collected by beach seine (Table 2). All seven species sampled only with the lampara were netted at site 3, while two of these species were also taken at site 2. Pink salmon (O. gorbuscha) were sampled only

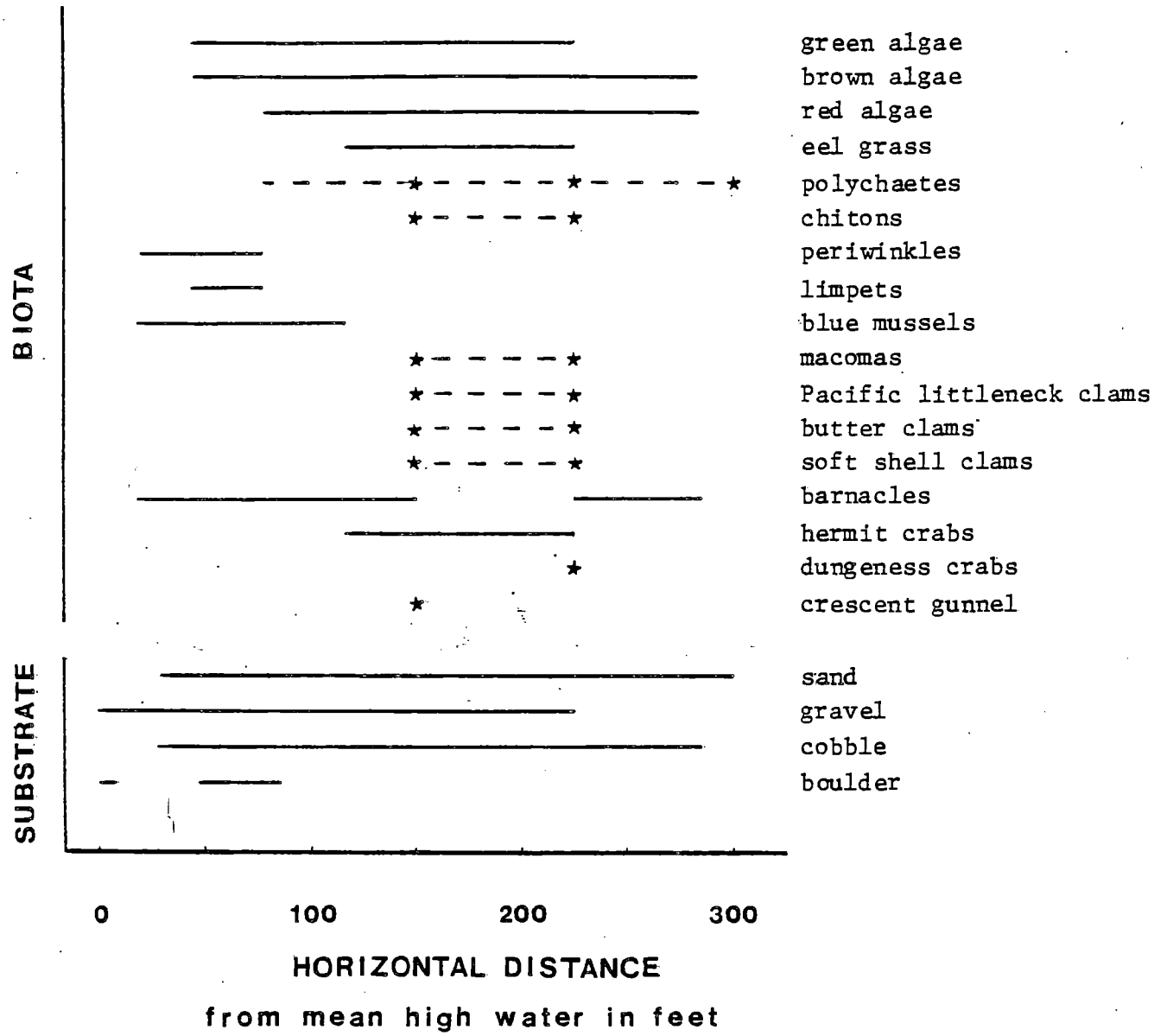

Figure 4. Substrate and predominant biota at harbor site 2 for a composite of two intertidal transects at Chignik, Alaska, 15 May 1984. Symbols: ★ - organism observed in quadrat; --- probable occurrence of infaunal or small epifaunal organism between quadrats.

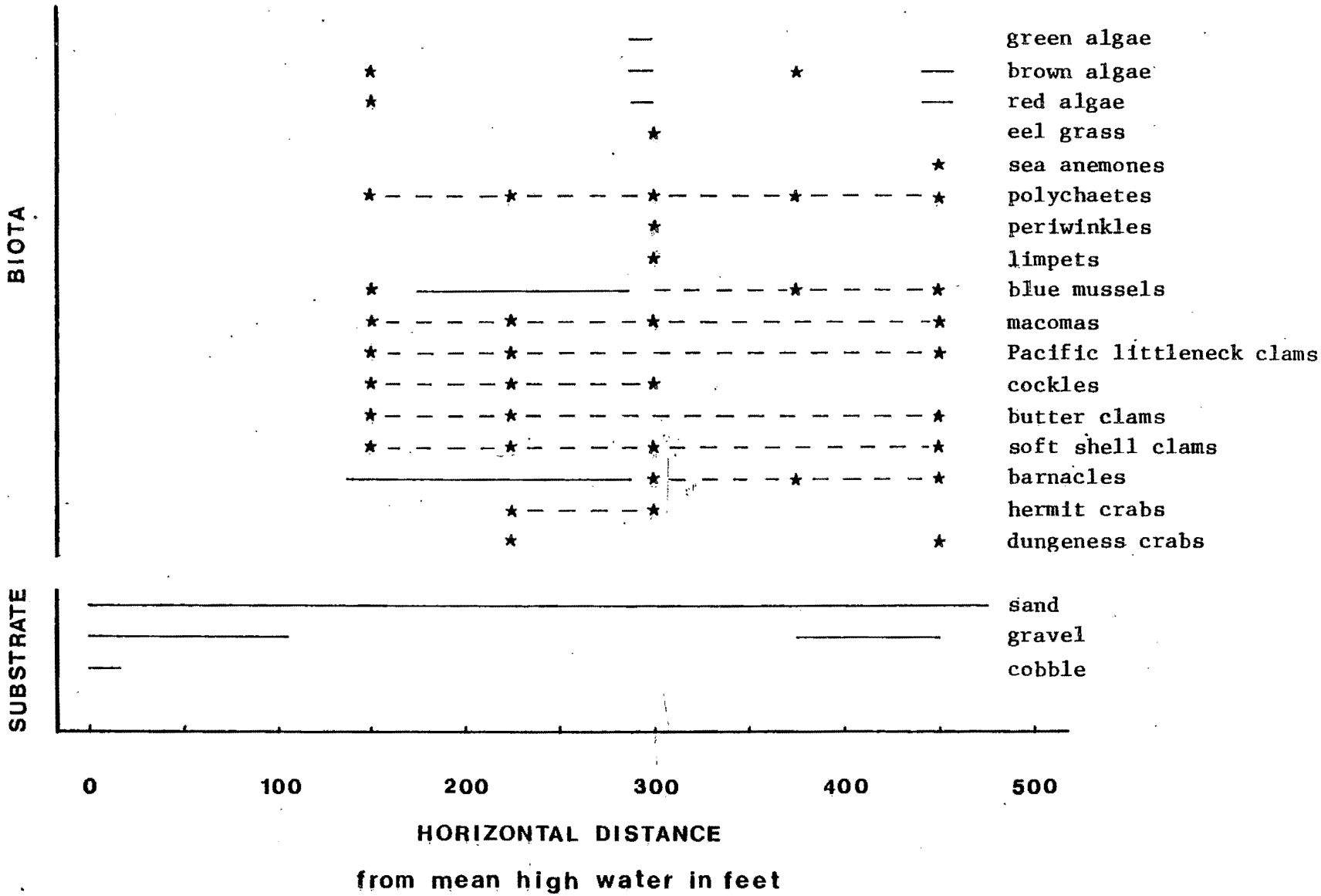

Figure 5. Substrate and predominant biota at harbor site 3 for a composite of two intertidal transects at Chignik, Alaska, 16 May 1984. Symbols: ★ organism observed in quadrat; --- probable occurrence of infaunal or epifaunal organism between quadrats.

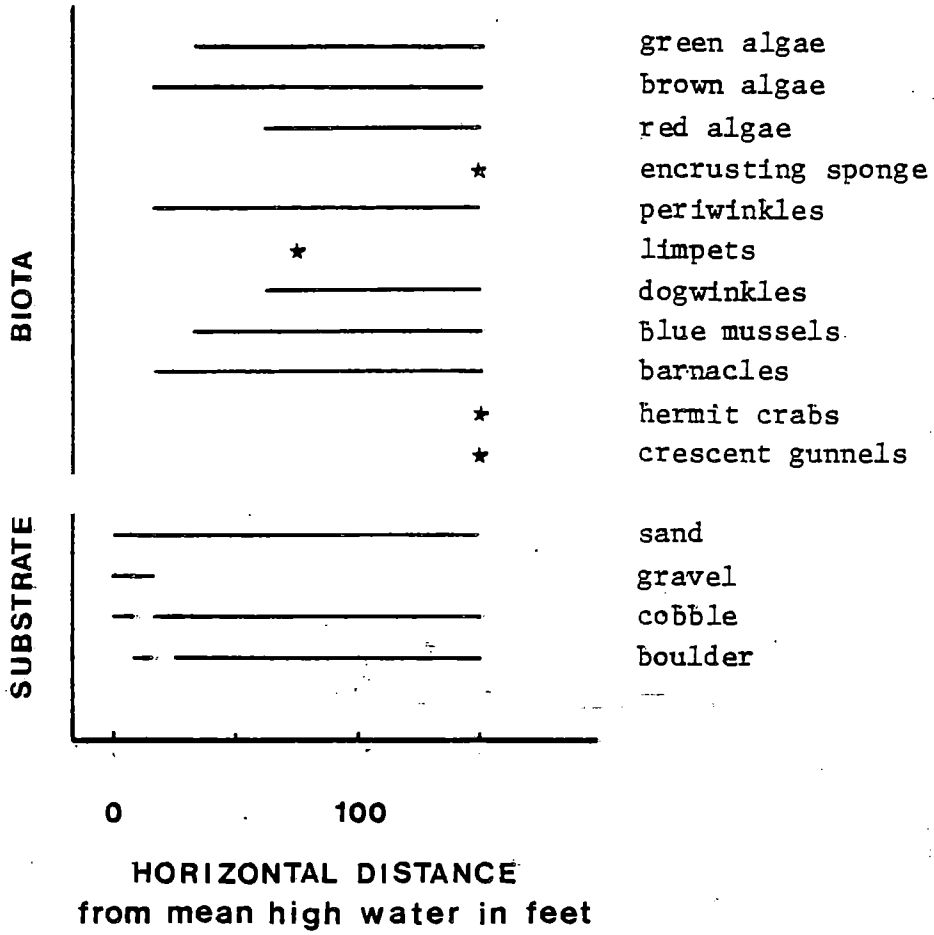

Figure 6. Substrate and predominant biota at the preferred quarry site along one intertidal transect at Chignik, Alaska, 18 May 1984. Symbols: ★ = organism observed in quadrat.

Table 1. Beach seining at harbor sites 2 and 3 at Chignik, Alaska, 14-18 May 1984.

Site 2				Site 3			
Date	Time	Length	Fish Collected	Date	Time	Length	Fish Collected
5/14	2030		6 rock sole				
			6 Pacific staghorn sculpin				
			many horse crabs				
			2 dungeness crabs				
				5/16	1115	300 ft	32 rock sole
							6 buffalo sculpin
							1 crescent gunnel
							1 masked greenling
							1 juvenile greenling
							1 Pacific herring (dead)
							1 caridae shrimp
							1 macoma
							1 margarite shell
							1 *Nucella* egg case
							1 *Urechis*
5/18	1330	670 ft	20 rock sole				
			7 buffalo sculpin				
			2 starry flounder				
			1 rock greenling				
			5 sockeye salmon				
			4 chum salmon				
			4 dungeness crabs				
			1 *Nephtys*				

Table 2. Lampara seining at harbor sites 2 and 3 Chignik, Alaska, 15-18 May 1984.

Site 2			Site 3		
Date	Time	Fish Collected	Date	Time	Fish Collected
5/15	1600	1 greatsculpin 2 rock sole 1 starry flounder	5/15	1400	9 rock greenling 6 masked greenling 1 lingcod 4 silver spotted sculpin 1 rock sole
5/18	2000	4 great sculpin 7 rock sole 4 starry flounder 1 juvenile gunnel	5/18	1915	5 pink salmon 7 rock greenling 8 masked greenling 3 silver spotted gunnel 1 red Irish lord 1 brown Irish lord 1 great sculpin
5/18	2045	7 rock greenling 23 masked greenling 1 silver spotted sculpin 2 great sculpin 28 rock sole 3 starry flounder 1 caridae shrimp 3 margarite shells	5/18	2145	10 rock greenling 11 masked greenling 7 silver spotted sculpin 2 great sculpin 2 tubenose poacher 3 rock sole 1 caridae shrimp 3 margarite shells

at harbor site 3. Six of the seven species collected only with the lampara are either bottom dwelling fish that remain deeper in the subtidal zone than the beach seine fished or are larger fish that avoided collection in the shorter gear. Some of the differences between fish collections in the two gears may also be attributable to sampling different tidal stages and different times of the day.

Minnow traps in the creek between the two harbor sites caught one Dolly Varden (Salvelinus malma) about 125 mm in length while the fyke net collected one Dolly Varden approximately 40 mm long. The wetlands adjacent to harbor site 2 yielded five Dolly Varden measuring up to about 175 mm in length. A Dolly Varden about 150 mm long was seen in Indian Creek Slough, but no fish were actually trapped there. No salmon were collected in either the creek or the wetlands.

Pintails (Anas acuta), green-winged teal (A. carolinensis), and golden-crowned sparrows (Zonotrichia atricapilla) were also observed using the wetlands adjacent to harbor site 2. Of the 18 species of birds observed throughout the project area, ten that use the bay or shoreline habitat, including an unidentified loon (Gavoa), harlequin ducks (Histrionicus histrionicus), semipalmated plovers (Charadrius semipalmatus), and common murres (Uria aalge) were noted. Observations of bird use at the preferred quarry site were hampered by adverse weather conditions and little data were collected at the site. No mammals were observed during these field investigations.

A species list of all biota observed and identified is presented in Appendix A.

DISCUSSION: The biological communities supported by the two harbor sites appear to be very similar in terms of species composition and overall community structure, although site 3 seems to support a greater abundance of organisms than does site 2. Stands of marine algaes and kelps are more dense and occur higher in the intertidal zone at site 3 due to boulder/cobble substrate there. These algaes provide the basic community structure which the epibenthic invertebrates, fishes, and higher trophic level organisms utilize. Only limited data were collected on infaunal organisms such as clams and polychaetes because of adverse weather conditions. However, sampling in 1983 indicates that these organisms may be more abundant at site 2, at least in mid- and lower intertidal zones. Densities subtidally are unknown.

Although only about half of the fish species sampled were collected at both harbor sites, fishes at the two sites occupy similar ecological niches. Juveniles fishes and small adult species use near shore areas while bottom dwelling species use deeper waters of the littoral zone. There may be diurnal movements of fish in which they move towards shore during darkness and away from shore during daylight. Such movements are common and correspond to feeding opportunities in near shore areas which are utilized at night when the risk of predation is reduced.

The collection of juvenile pink, chum, and sockeye salmon indicate that the proposed boat harbor sites are used as rearing habitat for these species. The absence of juvenile salmon in sampling efforts at the creek between the boat harbor sites and Indian Creek Slough, combined with other investigations of Indian Creek, suggests that most salmon collected in Anchorage Bay are produced in other areas such as Mud Bay and Chignik Lagoon.

Juvenile salmon appeared in fish collections 18 May, the last day of field sampling. This observation suggests that mid-May is probably the beginning of a seasonal use period of the boat harbor sites. The duration and magnitude of use has not been defined, but on the basis of salmon production in the Chignik area, use of the project area by juvenile salmon could be considerable.

Loss of salmon rearing habitat may be an important impact of a boat harbor project at either of the sites being studied. The existing benthic community providing this habitat will largely be destroyed by dredging. Although recolonization of the breakwater is possible, different biological assemblages would become established, and, based upon FWS observations at Sand Point and Port Lions, both diversity and abundance are likely to be lacking for several years after installation. Altered water circulation and degraded water quality may limit reestablishment of benthos within the mooring basin itself.

Perhaps as important as the direct loss of habitat is the problem of entrapment in the harbor, whereby migrating fish that enter have difficulty locating the entrance channel to leave the enclosure. Retention within the harbor area for even a few days can cause increased mortality of juvenile salmon either by predators such as Pacific cod and sculpins which congregate there or by stavation due to lack of feeding opportunities.

Dredging and spoil disposal pose other sources of impacts to the biological resources of the project area. Spoil disposal in the freshwater wetlands adjacent to the site is proposed as part of the development of harbor site 2. This would result in the loss of the only relatively undisturbed site of this habitat type in the immediate Anchorage Bay area. This area supports resident Dolly Varden and some waterfowl resting and feeding by species such as green-winged teal and pintails. No nesting of the latter was noted, but field investigations may have been conducted too early in the season to observe it. Perching birds like golden-crowned sparrows also use this wetlands habitat.

If harbor site 3 were developed, dredge spoils would be disposed of in the intertidal zone between the boat basin and the existing road to create a parking and staging area. This disposal plan would result in the loss of rocky intertidal habitat that is moderately productive and supports higher trophic level organisms, including salmon and other fish, marine birds, and sea otters. The latter were observed in field investigations conducted in 1983 along with evidence of their utilization of clam beds in the project area.

The preferred quarry site represents the least known feature of the project, as little data are available and no design specifications have been developed. The FWS Catalog of Alaskan Seabird Colonies indicates that no major colonies are know to occur in the quarry site vicinity. However, bald eagles were observed near the cliffs during our 1983 investigations and may use them for nesting as well as feeding and roosting. The intertidal zone appears to be moderately productive while no data have been collected subtidally.

Because of the preliminary nature of plans for the quarry site and the limited amount of biological data collected there, it is difficult to accurately anticipate the impacts that may be encountered if this site is developed. One observation that can be made at this time is that use of this site would avoid the necessity of extensive road building which would accompany the development of the other sites initially considered. More detailed impact assessment will be provided when the data base has been supplemented and specific plans for designing and siting this project feature have been outlined.

Mitigation of marine inter- and subtidal impacts associated with the construction of a small boat harbor project are limited to site selection, project design, and out-of-kind replacement. Site selection of one of the two harbor alternatives appears to be a judgment between different resource values, wetlands habitat versus somewhat more productive inter- and subtidal habitat. The data base is insufficient to be of much assistance in formulating a recommendation concerning selection of a harbor site on the basis of habitat value to rearing salmon, which is perhaps the most important use of the project area. However, if it is assumed that direct losses of salmon habitat would be similar at either site, then wetlands within the Anchorage Bay area become a key factor. The occurrence of relatively undisturbed wetlands habitat within the boundary of harbor site 2 leads to the conclusion that development of harbor site 3 would be the best harbor alternative, environmentally.

In the absence of siting criteria, design of project features will provide the best opportunity to mitigate salmon losses. Near shore breachs in breakwaters have successfully minimized entrapment of fish in similar situations and could be used in this project. They could also be designed to facilitate water circulation and result in improved water quality, both of which could facilitate the establishment of marine algaes and benthic invertebrates. Compensation for losses of rearing habitat could be accomplished only by developing out-of-kind mitigation.

As the nature and extent of impacts associated with constructing a small boat harbor project at Chignik become clarified during the planning process, additional needs and opportunities for mitigation will be identified.

RECOMMENDATIONS: The following recommendations are made on the basis of field investigations and design information made available to date. As other data are developed and engineering analyses completed additional recommendations will be provided to assist project planning.

1. Unless additional salmon use data would indicate otherwise, harbor site 3 is considered the environmentally preferred alternative for construction of a small boat harbor. Should new data result in changing the Corps of Engineers' preferred alternative to harbor site 2, design changes should be made so that the wetlands adjacent to the site are not used for disposal of dredge spoils. Rather, the parking and staging area should be located in the upper intertidal zone because impacts to this impoverished benthic community would be substantially less than those to the wetlands.

2. Breakwaters at either harbor site should be designed to include breaches adequately sized to provide for unobstructed near shore movement of fishes and to permit water circulation that will maintain water quality within the mooring basin.

3. An additional site visit to the preferred quarry may be necessary depending upon the location and design of this project feature. Similarly, further field work could become necessary if dredge spoil quantities are too large to be utilized in the construction of staging and parking facilities and off-site disposal becomes necessary. Timing these field efforts to coincide with the occurrence of salmon smolts in Anchorage Bay would also permit data collection to better address that information gap.

4. Fish and Wildlife Service personnel should be actively engaged in project planning in regards to both design and siting of project features.

APPENDIX A Species list of biota collected and observed during biological sampling at Chignik, Alaska, 13-18 May 1984.

CLASSIFICATION	COMMON NAME
Division Chlorophycophyta (Green algae)	
Class Chlorophyceae	
Cladophora sp.	
Monostroma sp.	
Division Phaeophycophyta (Brown algae)	
Class Phaeophyceae	
Alaria sp.	wing kelp
Fucus sp.	rockweed
Scytosiphon lomentaria	whip tube
2 unidentified species	
Division Rhodophycophyta (Red algae)	
Class Rhodophyceae	
Antithamnion sp.	
Callithamnion pikeanum	beauty bush
Callophyllis flabullulata	
Halosaccion glandiforme	sea sac
Laminaria saccharina	sugar wrack
Lithothamnium sp.	red rock crust
Rhodomela larix	black pine
1 unidentified species	
Division Anthophyta (Flowering plants)	
Zostera marina	eel grass
Phylum Poriphera (Sponges)	
Unidentified species	yellow encrusting sponge
Phylum Cnidaria	
Class Anthozoa (Sea Anemones)	
Anthopleura artemisia	
Metridium senile	white plumed anemone
Phylum Nemertinea (Proboscis worms)	
Unidentified species	

CLASSIFICATION	COMMON NAME
Phylum Annelida (Segmented worms)	
Glycera sp.	
Nephtys sp.	
Nereis sp.	
Owenia sp.	
Pectaneria sp.	cone worm
Spirorbis sp.	tubeworm
Terrebellidae	
Phylum Mollusca	
Class Amphineura (Chitons)	
Mopalia sp.	
Tonicella lineata	redlined chiton
Class Gastropoda (Univalve mollusks)	
Acmaea sp.	limpet
Fusitriton oregonensis 1/	
Littorina sitkana	Sitka periwinkle
Margarite pupillus	puppet margarite
Nucella canaliculata	channeled dogwinkle
Polinices draconis 1/	Drake's moon snail
Class Pelecypoda (Bivalve mollusks)	
Clinocardium nuttallii	Nuttall's cockle
Hiatella arctica	arctic saxicave
Macoma baltica	bathica macoma
Macoma calcarea	chalky macoma
Macoma inconspicua	
Macoma nasuta	bent-nose macoma
Mya truncata	soft-shell clam
Mytilus edulis	blue mussel
Protothaca staminea	Pacific littleneck clam
Saxidomus gigantea	butter clam
Phylum Arthropoda (Joint-footed animals)	
Class Crustacea	
Balanus cariosus	acorn barnacle
Balanus glandula	barnacle
Cancer magister	dungeness crab
Pagurus sp.	hermit crab
Telmessus cheiragonus 1/	horse crab
Idothea wosnesenskii	green sea louse
Idothea sp.	isopod
Pasiphaea pacifica	glass shrimp
unidentified shrimp	
Gammaridae	gammarid amphipod
Phylum Echiurida (Marine worms)	
Urechis sp.	

CLASSIFICATION	COMMON NAME
Phylum Chordata	
Class Osteichthyes (Bony fish)	
Oncorhynchus gorbuscha	pink salmon
Oncorhynchus keta	chum salmon
Oncorhynchus nerka	sockeye salmon
Salvelinus malma	Dolly Varden
Clupea harengus pallasi 2/	Pacific herring
Pholis laeta	crescent gunnel
Pholis sp.	gunnel
Hexagrammos lagocephalus	rock greenling
Hexagrammos octogrammus	masked greenling
Ophiodon elongatus	lingcod
Belpsias cirrhosus	silverspotted sculpin
Enophrys bison	buffalo sculpin
Hemilepidotus hemilepidotus	red Irish lord
Hemilepidotus spinosus	brown Irish lord
Leptocottus armatus	Pacific staghorn sculpin
Myoxocephalus polyacanthocephalus	great sculpin
Pallasina barbata aix	tubenose poacher
Lepidopsetta bilineata	rock sole
Platichthys stellatus	starry flounder
Class Aves (Birds)	
Gavoa sp.	loon
Phalacrocrax sp.	cormorant
Anas acuta	pintail
Anas carolinensis	green-winged teal
Histrionicus histrionicus	harlequin duck
Haliaeetus leucocephalus	bald eagle
Charadrius semipalmatus	semipalmated plover
Tringa sp.	yellowlegs
Larus glaucescens	glaucous-winged gull
Rissa tridactyla	black-legged kittiwake
Uria aalge	common murre
Cepphus columba	pigeon guillemot
Pica pica	black-billed magpie
Corvus corax	common raven
Hylocichla guttata	hermit thrush
Zonotrichia atricapilla	golden-crowned sparrow
Passerella iliaca	fox sparrow
Plectrophenax nivalis	snow bunting

1/ Shell or exoskeleton only
2/ Dead specimen

APPENDIX B Chignik Small Boat Harbor Preliminary Mitigation Statement

Under the Fish and Wildlife Coordination Act (FWCA) and the National Environmental Policy Act (NEPA) regulations, the Fish and Wildlife Service (FWS) has responsibilities to insure that project-related losses to fish and wildlife resources are identified and mitigated. As part of our participation in the planning and evaluation of the Chignik Small Boat Harbor project, a mitigation plan should be developed in accordance with the FWS Mitigation Policy (FR Vol. 46, No. 15, January 23, 1982) and in consultation with the National Marine Fisheries Service (NMFS), the Environmental Protection Agency (EPA), and the Alaska Department of Fish and Game (ADF&G). The plan would provide guidance for evaluating and mitigating impacts of the proposed project to fish and wildlife.

A mitigation plan is developed by first selecting important fish and wildlife habitats from among the full range of habitats occurring within the area to be impacted by both direct as well as indirect impacts. These are chosen either because they represent resources which are most characteristic of the area or because the Fish and Wildlife Service has mandated responsibilities for them. By narrowing the scope in this way, the analyses can focus on areas where significant changes are most likely to occur and not be unduly burdened by inclusion of areas with low wildlife value.

After identifying important habitats, evaluation species, which function as indicators of habitat quality and quantity, are chosen. Selection of evaluation species has an important role in determining the extent and type of mitigation achieved. A combination of two sets of criteria is typically used to choose species for this purpose. The first is to pick species with high public interest, subsistence, or economic values while the second is to select species which utilize habitats having significant ecological values.

Fish and wildlife habitats are then assigned to one of the four Resource Categories delineated in the FWS Mitigation Policy (Table 1). Designation of habitat into Resource Categories ensures that the level of mitigation recommended is consistent with the value of that habitat and its relative abundance on an ecoregion or national basis.

Thus far, field studies have identified three species, sockeye, pink, and chum salmon, which have been selected as the basis for evaluating impacts and formulating mitigation requirements for the Chignik Small Boat Harbor project. Information concerning the habitat value of the project area for these species is limited. However, based on availability of habitat nation-wide, the habitat for each species would be assigned to either Resource Category 2 or 3. Additional evaluation species will be identified as data indicate necessary.

Table 1. Resource Categories and Mitigation Planning Goals.[1]

Resource Category	Designation Criteria	Mitigation Planning Goal
1	Habitat to be impacted is of high value for evaluation species and is unique and irreplaceable on a national basis or in the ecoregion section.	No loss of existing habitat value.
2	Habitat to be impacted is of high value for evaluation species and is relatively scarce or becoming scarce on a national basis or in the ecoregion section.	No net loss of in-kind habitat value.
3	Habitat to be impacted is of high to medium value for evaluation species and is relatively abundant on a national basis.	No net loss of habitat value while minimizing loss of in-kind habitat value.
4	Habitat to be impacted is of medium to low value for evaluation species.	Minimize loss of habitat value.

[1]Taken from FWS Mitigation Policy (FR Vol. 46, No. 15, 23 January 1981).

The determination of the relative scarcity or abundance of evaluation species habitat from the national perspective is based upon (1) the historical range and habitat quality and (2) the current status of that habitat. A significant reduction in either the extent or quality of habitat for an evaluation species indicates that it is scarce or becoming scarce, while maintenance of historical quantity and quality is the basis for considering it abundant.

Specific ways to achieve the mitigation goal for Resource Category 2 when loss of habitat value is unavoidable include, "(1) physical modification of replacement habitat to convert it to the same type lost; (2) restoration or rehabilitation of previously altered habitat; (3) increased management of similar replacement habitat so that the in-kind value of lost habitat is replaced; or (4) a combination of these measures. By replacing habitat value losses with similar habitat values, populations of species associated with that habitat may remain relatively stable in the area over time."1/

The mitigation goal of in-kind replacement of lost habitat, however, cannot always be achieved. When opposition to a project on that basis alone is not warranted, deviation from this goal may be appropriate. Two such instances occur when either different habitats and species available for replacement are determined to be of greater value than those lost, or when in-kind replacement is not physically or biologically attainable in the ecoregion. In either case, replacement involving different habitat kinds may be recommended, provided that the total value of the lost habitat is compensated.

For Resource Category 3, in-kind replacement of lost habitat is preferred though not always possible. Substituting different habitats or increasing management of different habitats so that the value of the lost habitat is replaced may be ways of achieving the planning goal of no net loss of habitat value.

Identification of evaluation species and designation of Resource Categories represent the first step to be taken toward the completion of a mitigation plan. Upon completion of project design and impact analysis, a mitigation plan can be fully developed.

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