

State of California - The Resources Agency
Department of Fish and Game
Marine Resources Region
Long Beach, California

CRUISE REPORT 73-KB-29

ABALONE - LOBSTER INVESTIGATIONS

Prepared by Richard Burge, Steve Schultz and Mel Odemar

Vessel: KELP BASS

Dates: October 29 to November 4, 1973

Locality: China Point and White Rock, San Clemente Island, and Johnson Rock, Catalina Island.

- Purposes:
1. To assess abalone populations by stratified random sampling at China Point.
 2. To determine abalone abundance by size class, depth, and area.
 3. To investigate the ecological relationship of abalone, i.e., substrate, forage, competitors, and predators.
 4. To tag green abalone, *Haliotis fulgens*, time and weather permitting.
 5. Collect spiny lobster, *Panulirus interruptus*, for life history studies.

Procedure: Scuba divers occupied 23 stations selected at random within blocked strata. Three strata were first established by depth (Stratum I, 0-4 fm.; Stratum II, 4-12 fm.; Stratum III, 12-24 fm.) to insure that all depths and all abalone species would be sampled. Strata were further divided into four blocks to prevent clumping of randomly selected stations (Figure 1).

A 30 m transect was set from a skiff at each station except in dense kelp beds where an underwater transect reel was employed. Each transect consisted of 5 sampling units: 4 band transects 10 x 2 m and a quadrat 5 x 4 m. The quadrat served as both a 5th sample unit and as a specialized juvenile sampling area.

All visible abalone were picked within the sampling units and were brought to the surface for measurements. Counts were made of competitors and predators and relative abundance estimates were made of major brown algae present. Substrate characteristics were noted and water depth, temperature, movement, and visibility were recorded.

Quadrats were sampled only in the two shallowest strata (Strata I and II) as divers were greatly limited by bottom time in Strata III. All boulders were turned and crevices opened whenever physically possible to enumerate and measure cryptic juvenile abalone.

Three overnight lobster trap sets were made at China Point. The traps constructed of 1 inch x 1 inch mesh were set at 50 and 75 ft depths. Additionally, 2 dives were made in the vicinity of White Rock to collect lobster. All lobster were measured (carapace length) sexed, and reproductive and shell condition noted.

Results:

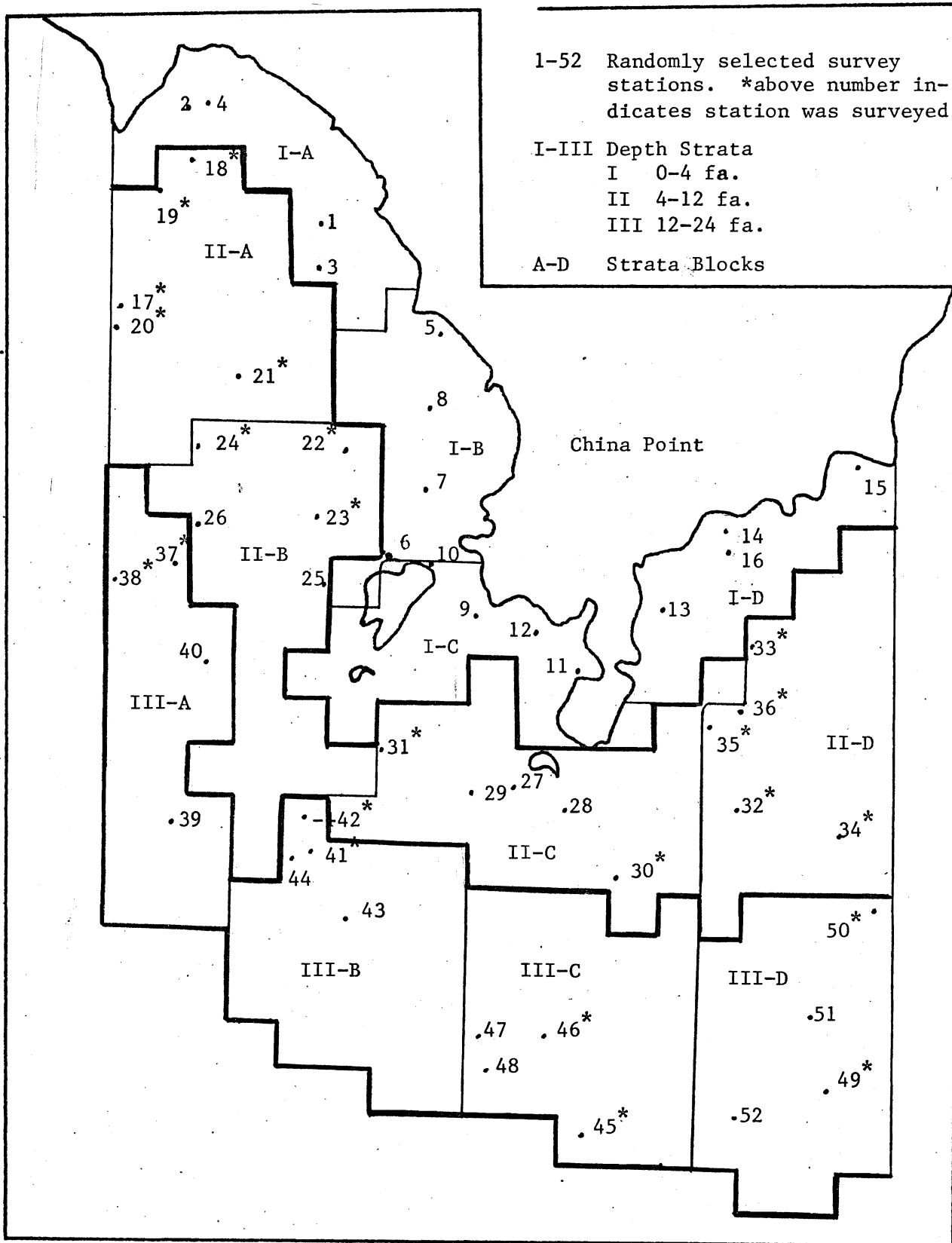
Abalone - Twenty-three stations, including 92 band transects and 15 quadrats, were surveyed on October 30 and 31 (Figure 1). Forty-five abalone were recovered from the 107 sampling units including 36 pink abalone, *Haliotis corrugata*, 4 green abalone, *H. fulgens*, and 5 white abalone, *H. sorenseni*. Pink abalone ranged in length from 100 to 184 mm with 3 of commercial legal size (158.7 mm, 6¼ inches) and 6 of sport legal size (152.4 mm, 6 inches). The four green abalone ranged from 162 to 198 mm, all over the 6 inch sport size and one over the commercial size (177.8 mm, 7 inches). The five white abalone were 118 to 192 mm in length, 3 of which were both sport (6 inches) and commercial (6¼ inches) legal. Eight additional pink abalone were collected within quadrats by turning rocks. These ranged in length from 21 to 133 mm.

Only 2 abalone, 1 pink and 1 white, were observed in Stratum 3 which included 8 stations and 32 sampling units in 78 to 135 ft depths. Most stations were on sand and generally we observed a transition from rocky to sandy substrate at about the 90 ft contour. Moderate to strong bottom surge prevented the occupation of stations in Stratum I (0-4 fm).

Major abalone forage items observed in the survey area included large surface beds of giant kelp, *Macrocystis*, many benthic beds of elkhorn kelp, *Eisenia arborea*, feather boa kelp, *Egregia laevigata*, basal segments of *Halidrys dioica* or *Cystoseira osmundacea*, *Laminaria farlowii*, and several lower growing brown algae such as *Dictyopteris* sp. and *Dictyota flabellata*. Articulated and crustose corallines were common throughout the area while *Gelidium* and *Phyllospadix* were common at most shallow stations.

The survey was not completed due to rough seas and no population size or size class structure can be computed until all stations have been surveyed within their respective strata. The survey will be completed during our November 15-20, 1973 cruise, weather permitting.

FIGURE 1. San Clemente Island - China Point Survey area showing location on depth strata, strata blocks, and stations surveyed on Oct. 30, 31, 1973



Rough seas prevented safe skiff operations on November 1-3 and military operations precluded the tagging of green abalone at Northwest Harbor. Thus operations were moved to White Rock on the leese of San Clemente Island on November 1-2. Reconnaissance observations and photographs were made of abalone populations and deep water (60 to 80 ft) beds of elkhorn kelp, *Pelagophycus porra*.

Operations were moved to our green abalone tagging site near the west end of Catalina Island on November 3. No tagged abalone mortalities were found and approximately 150 juvenile pink and green abalone (20-100 mm) were collected and taken to our Morro Bay laboratory.

Results: Lobster - A total of 157 lobster was trapped in 3 overnight trap soaks on October 31 and November 2 and 3 off China Point, of these 157, 4 (2.5%) were of legal size (≤ 83 mm). The percent of legal lobster is somewhat lower than what would normally be encountered due to the small size of our mesh (1 inch x 1 inch). The composition of the catch was as follows:

	Depth: 50 ft - 4 sets	
	<u>Male</u>	<u>Female</u>
n	12	58
%	17.1	82.9
size range (mm)	49-82	48-78
\bar{x}	67.5	66.2
number/trap (both sexes)	17.5	

	Depth: 75 ft - 8 sets	
	<u>Male</u>	<u>Female</u>
n	24	63
%	27.6	72.4
size range (mm)	55-104	55-83
\bar{x} (mm)	72.0	67.1
number/trap (both sexes)	10.9	

Eighty-six lobster were taken by hand at a depth of 15-25 ft on November 1 and 2 near White Rock. Carapace lengths were slightly smaller than those encountered off China Point with only one of legal size (1.2%). Sex composition was 1 : 1 as contrasted to the high proportion of female observed off China Point. The catch composition was as follows:

	<u>Male</u>	<u>Female</u>
n	43	43
%	50	50
size range (mm)	50-87	50-82
\bar{x} (mm)	62	66

No berried females were noted at either location, and 2 lobster had recently molted.

Personnel:	Marco Mazarovich, Vessel Captain	Steve Schultz, Biologist
	Richard Burge, Biologist-in-charge	Robert Hardy, Biologist
	Mel Odemar, Biologist	Robert McAllister, Biologist