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

CRUISE REPORT 74-KB-18 and 74-M-4 - ABALONE-LOBSTER INVESTIGATIONS

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Vessels: R/V KELP BASS and R/V MOLLUSK

Dates: July 10-19, 1974

Locality: San Clemente Island

Purpose:

1. To retrieve pink abalones, *Haliotis corrugata*, tagged July 1973 at China Cove and Pyramid Head.
2. To tag additional pink abalones as time allows.
3. To collect pink abalones for length-weight and gonad analysis.
4. To conduct escape-port studies for commercial lobster traps.

Procedure: Divers carefully retrieved tagged abalones, measured length and width, tag-coded each with colored wire, and returned them to an abalone scar. Additional untagged pink abalones were picked, tagged with stainless steel tags, measured, and returned. Divers photographed underwater procedure including predation. A sample of pink abalones was collected on the last day for transportation to Long Beach for work-up.

Lobster traps were set to evaluate escapement of sublegals through escape ports of various design.

Results: A total of 739 pink abalones was retrieved and remeasured including 375 at Pyramid Head and 364 at China Point. We were able to further divide the original China Point tagging area into two distinct areas based on depth and substrate: a 3-5 m (9.9 - 16.5 ft) depth, mixed boulder and reef habitat that we named "inside reef" and a 6-8 m (19.8 - 26.4 ft) depth, broken reef and channel habitat named "outside reef".

Of the original 848 pink abalones tagged and replaced at Pyramid Head in July 1973, 44.2% (375) were retrieved and remeasured during this cruise, 49.3% (418) were not accounted for, 0.2% (2) were lost as a result of natural mortality, 0.2% (2) were rejected for growth determination, and 6.1% (51) were mortalities attributed to the original tagging. An additional 8.0% (68) were deeply cut or lost to predators during remeasuring operations.

Of the original 990 pink abalones tagged at China Point, 36.8% (364) were remeasured, 53.4% (529) are not accounted for, 0.5% (5) were lost as a result of natural mortality, 0.3% (3) were rejected, and 9.0% (89) were tagging mortalities. An additional 7.5% (74) loss occurred during remeasuring operations.

Growth rates of pink abalones declined significantly in all study areas before reaching either sport (152 mm - 6 inches) or commercial (158 mm - 6¼ inches) size. Commercial size pink abalones at 158 mm averaged only 2.28 mm (0.09 inches) growth per year. Study area averages ranged from 1.67 to 3.07 mm (0.05 - 0.12 inches). Sport size pink abalones at 152 mm averaged just 2.85 mm (0.11 inches) growth per year with a range of 2.63 to 3.17 mm (0.10 to 0.12 inches). Four inch (102 mm) pink abalones averaged about 17 mm (0.05 inches) per year while 5-inch (127 mm) pink abalones averaged about 9 mm (0.35 inches) growth.

An additional 311 pink abalone were picked at "outside reef" of which 36 were badly cut and 275 were tagged, measured and returned. Of the 275 returned, 27 were known to be lost to predators, 17 to sheephead, *Pimelometopon pulchrum*, and 10 to bat rays, *Myliobatis californica*. A number of fresh shell piles were seen after planting, suggesting the loss to bat rays was considerably higher than that recorded. The known pink abalone loss of this group, including those deeply cut and not returned, and those lost to predators, was 20.3%

A sample of 255 pinks ranging in length from 91-180 mm (3.6 - 7.2 inches) was collected at China Point on July 18 and transported to Long Beach for processing. Measurements recorded included length, width, total weight, foot weight, visceral mass weight, shell weight and notes on sex and sexual maturity (Table 1). Additionally, approximately 10 female gonads from each 10 mm (0.4 inch) size class were excised from the visceral mass and preserved in 10% formalin for fecundity measurements.

A second sample of juveniles was taken by turning boulders, examining crevices, and collecting all small abalones seen. These were measured and weighed in Long Beach to obtain length-weight data on juveniles, population size class structure, and to see if year-class modes were discernable on histogram plots.

Lobster: We tested lobster trap escape ports seven days at Pyramid Cove. The port size currently considered is 2-3/8" x 8" I.D. We fished ten matched pairs of traps, sice by side; one of the pair had ports, the other did not. The results were as follows:

Trap	Legals	Shorts	Ratio
With ports	25	20	1:0.8
Without ports	15	145	1:9.67

Escape ports had two configurations, a "2 holer" (two ports, side by side) and a "4 holer" (two above, two below). The results were as follows:

Trap	Legals	Shorts	Ratio
2 ports	16	18	1:1.13
4 ports	9	2	1:0.22

Personnel:

Donald Carvalho, Vessel Captain
Richard Burge, Biologist-in-charge (abalone)
Robert Bell, Biologist-in-charge (lobster)
Robert Hardy, Biologist
Steve Schultz, Biologist
Mel Odemar, Biologist
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TABLE 1. Size Class Frequency, Total Weight, Foot Weight, Sex Ratio, and Gonad Condition of 255 Pink Abalones Collected at China Point, San Clemente Island during 74-KB-18 and 74-M-4

Size class (mm)	Frequency	Percent frequency	Average total weight (g)	Average foot weight (g)	Sex ratio f/m	General gonad condition
91-100	17	6.67	145	61	5/10	Developing
101-110	28	10.98	190	74	8/16	Developing
111-120	18	7.06	275	109	6/11	Developing or mature
121-130	18	7.06	363	147	8/10	Most mature and ripe
131-140	35	13.72	516	195	14/20	All mature and ripe
141-150	78	30.59	627	241	36/42	Ripe
151-160	47	18.43	771	281	25/22	Ripe
161-170	11	4.31	938	351	5/6	Ripe
171-180	3	1.18	1137	373	1/2	Ripe
	255	100.00			108/139*	

* Sex determination was not possible on all specimens.