This Internet resource is a modified version of A Guide to the Artificial Reefs of Southern California (1989), by Robin D. Lewis and Kimberly K. McKee, with the Nearshore Sportfish Habitat Enhancement Program. The guide was updated by Dennis Bedford in 2001.

This booklet was a group effort of the Nearshore Sportfish Habitat Enhancement Program (NSHEP) staff. Kenneth C.Wilson perceived the need for the original booklet in 1989. Some relocating and mapping operations were conducted by Ecosystems Management Associates, Inc., under contract with CDFW. Norma C. Smallbone produced the graphics and cover design under an impossible deadline. John J.Grant wrote the original 1989 text, which accompanies these figures and diagrams, most of which remains intact in the 2001 update. Relocation of reefs and recording with differentially corrected GPS was done with the assistance of Greg Walls, Juan Hernandez and Jerry Kashiwada, all members ofthe NSHEP staff. Herb Frey contributed guidance and editorial assistance. Credit is also due to our secretarial staff who responded to our last-minute requests.

Cover design, maps and layout by Norma C. Smallbone.

A GUIDE TO THE ARTIFICIAL REEFS OF SOUTHERN CALIFORNIA

SPORT FISH RESTORATION

CALIFORNIA FISH AND GAME

INTRODUCTION

This booklet is offered as a convenient guide to illustrate and describe the location, topography and some living resources of artificial reefs along the southern California coast. It is also intended to increase public awareness, knowledge, and use of these artificial reefs built by the California Department of Fish and Game (DFG).

Artificial reef construction is one aspect of the DFG's Nearshore Sport fish Habitat Enhancement Program for restoring or enhancing sport fish habitat along the southern California coastline. The program has also made significant contributions to the improvement of sport fish habitat through kelp forest restoration on Palos Verdes Peninsula, in Los Angeles County, and along the Santa Barbara and Orange County coast. The program's objective is to maintain sportfishing success in the face of the cumulative effects of increasing fishing pressure as well as negative impacts on the nearshore ecosystem. Coastal sport fishing in California is important in providing food and recreation to a large and increasing human population. Good fishing for many of the most popular sport fish species usually exists where natural reefs, rocky headlands, and shoals are located. However, most southern California coastal subtidal areas are characterized by sand, silt, or muddy bottom, with only occasional small rocky patches. Such areas provide little support for reef associated sport fishes or for development of the marine life these fishes require for food and habitat. With this in mind, in 1958 the DFG began a program of artificial reef research and development. This booklet is one result of that program.

HOW TO USE THIS BOOKLET

The reefs are described by Latitude-Longitude coordinates, bearings from nearby access ports, and materials of construction. While maps and bearings are included, THIS PUBLICATION IS NOT INTENDED FOR NAVIGATION PURPOSES. Users are reminded that some of the coordinates listed for the reefs were generated from older shipboard LORAN-C units. Readings of LORAN receivers vary considerably. More recent reefs were charted utilizing differential GPS. Consequently, we recommend that when reefs vary from actual chart coordinates, users make their own GPS readings once a reef has been located. This will make the reef easier to located on subsequent trips.

While some minor physical changes may occur over time, the maps should present a reasonably accurate long-term view of the reef configurations. Several of the reefs described are marked by buoys; nevertheless, these are often lost or destroyed and, when replaced, are usually in somewhat different location on the reef complex. Consequently, bearings taken from buoys on one trip may not be reliable on subsequent trips. The reefs are discussed in the order they occur along the coast from north to south. Each reef location is indicated on its map together with Latitude - Longitude coordinates. Each location also indicates, where possible, distance and bearings from nearest port, boat launching facility, and /or landmark. Finally, each reef is diagramed from a vertical perspective, essentially providing a "footprint" of the reef.

SPORT FISH HABITAT ENHANCEMENT

During the early days of the program, DFG marine biologists investigated the effectiveness of various reef materials for increasing sportfishing success. The first two reefs in California were constructed of donated materials, since the DFG's artificial reef project had not yet been funded. The operators of Paradise Cove Landing in northern Santa Monica Bay contributed 20 old automobile bodies to DFG. These old cars were placed in 50 feet of water at Paradise Cove in May 1958. In September 1958, six old wooden streetcars were placed in 60 feet of water near Redondo Beach. The donated streetcars were sunk at the site by the U.S. Navy, which towed them from Los Angeles Harbor.

These early artificial reefs were designed to test the effectiveness of such structures in attracting fish. They proved very successful. DFG marine biologist, using scuba, carried out extensive observations of the reefs for several years. Fishes began to aggregate around the Paradise Cove car body reef within hours of construction. Surfperches, sargos, kelp bass, and small California halibut were among the first fishes attracted to the reef, followed closely by sheephead and opaleye. Later, rockfish and sand bass appeared. The fish population on the reef increased, until a high of 24,000 semi-resident fishes was counted in September 1960. During a 30 month survey period, 49 species of fish were noted on Paradise Cove Reef.

Similar results were observed at Redondo Beach Reef. The streetcars attracted 3,000 fishes, of 47 species, within 25 months. The success of the reefs was attributed to three main factors: the schooling behavior of fish, the availability of food and shelter, and a phenomenon known as thigmotropism (the tendency of fish to orient close to a solid object).

The success of artificial reefs in attracting and concentrating fishes caused the DFG to initiate a program to investigate the cost-effectiveness and practicality of various reef building materials. An experiment was designed to determine the enhancement characteristics

resulting from the construction of reefs of similar materials in four separate locations in Santa Monica Bay. Funded by the Wildlife Conservation Board, these replication reefs were placed in 60 feet of water off Malibu, Santa Monica, and Hermosa Beach. Each reef had one streetcar, several old car bodies, quarry rock, and concrete boxes placed in equal volumes and similar configuration. These reefs were built on relatively barren sand areas remote from productive, natural rocky substrate. Observations over several years indicated that concrete boxes were the most effective in attracting fishes, with quarry rock a very close second. Quarry rock, at half the cost of the fabricated concrete boxes proved to be the most cost-effective material. While subsequent studies have further substantiated the value of quarry rock, due to its potential for colonization by, and production of, food organisms, the availability of surplus concrete from port side demolition projects has proven to provide both a cost effective and productive material as well.

Since the early days of DFG's artificial reef construction program, several other materials have been tried with varied success. In the 1970's and 80's used automobile tires were constantly being offered for use, but have not proven workable in California, as in other coastal states, because of problems in keeping tire reefs in place and because they seem to offer a poor surface area for attachment of marine organisms. There is also a potential for release of harmful chemicals from the tires over time. Several ships have been sunk as reefs. The first, retired Liberty ship, the PALAWAN, was placed off Redondo Beach in about 120 feet of water. In 1987 a retired kelp harvesting vessel, the EL REY, formed the nucleus of a three ship submerged "fleet" off Mission Beach in San Diego. Observations of the Mission Beach vessels through the early 1990's showed that vessels did not provide enough small hiding places as do quarry rock of broken concrete rubble, and so further use of ships as reefs was abandoned.

After the early investigative work from 1958 to 1964, the Department continued to augment existing reef sites with quarry rock, and donated concrete piping and rubble. Fishing reefs were also constructed around seven of southern California's fishing piers.

The reefs were occasionally observed by DFG biologists during the course of other work. However, in 1980 DFG began a major program of artificial reef construction and research.

Recent Reef Development

Southern California Edison (SCE), a major utility company, operates a number of coastal power plants. SCE biologists were aware of the potential that such power plants could negatively impact nearby kelp forests, through distribution of nearshore sediments by cooling waters. To address this concern and to develop more effective

reefs for enhancing sport fish populations, DFG and SCE began a cooperative project leading to construction of Pendleton Artificial Reef (PAR). Studies were conducted by DFG biologists to evaluate the PAR's potential for enhancing marine resources. In fall 1980, PAR, a "state-of-the-art" quarry rock reef, was constructed in northern San Diego County. Intensive studies were conducted at PAR from 1980-1986, by DFG biologists and others, to learn how to more effectively enhance stocks of marine fishes, shell fishes, and plants using artificial reefs. The information developed during these studies has been used to design new and more effective artificial reefs built since 1984. Studies on this new generation of reefs are being used to further improve designs of future reefs in the continuing search for the most effective reefs for enhancing marine resources.

Since the publication of the original booklet in 1989 two new reefs have been built, and existing reefs have been extensively augmented. In 1990 Carlsbad Artificial Reef was constructed from quarry rock, in anticipation of the re-opening of the mouth of Batiquitos Lagoon. In 1991 International Artificial Reef was constructed from quarry rock in deep water (165 ft. depth) near the international border.

Bolsa Chica Artificial Reef off Orange Co. has increased from 10,000 tons to 120,000 tons of material. During the summer of 2001 it will grow to 160,000 tons.

During 1992, 9000 tons of broken concrete rubble was scattered over 11 acres at the Mission Beach Artificial Reef. In less than one year this reef supported a large kelp bed. The kelp remains ten years later. This represents the first time a kelp bed has been sustained on a long term basis on an artificial reef in southern California.

During the fall of 1999 Southern California Edison built an experimental mitigation reef off San Clemente, covering 22 acres of bottom. Similar in construction to the Mission Beach Kelp Artificial Reef, the SCE reef is designed to support a kelp bed and associated community. While it is too soon to render a judgement on the long term success of this experiment, as of the spring of 2001 it appears to be well on its way to succeeding, as it supports kelp canopy over most of its 22 acres.

How Reefs Work (Aggregation and Production)

Artificial reefs have been used for over 200 years to enhance fishing catches. Early Japanese fishermen used mounds of stone, laboriously carried to selected locations in boats, to attract fish. Construction of rock reefs continues in Japan. Currently, Japan spends approximately $60 million per year for fisheries enhancement projects, including artificial reef construction. Japanese reef designers have concentrated on creating reefs which attract fishes, primarily to increase harvest rather than increase production.

Early in California's reef development efforts, DFG marine biologists noted the immediate attraction of large numbers of fishes to artificial reefs, and thus considered reefs successful. Later, we began to look at the overall impact of such reefs on fish populations. If the reefs simply attracted fishes and made them easier to catch, we were doing little to maintain or increase fish populations. Although increased sport fishing success initially makes anglers happy, the long-term effects of increased local fishing pressure could result in decreased fish stocks and lower catches. Consequently, reef design and studies were directed toward developing reefs that increase fish production by augmenting shelter and forage for target species.

Japanese scientists found that fish attraction was generally greatest in those reefs with the highest profile to water depth ratio. They built tall, open, prefabricated reef structures that provided little surface area, but considerable high relief. By altering these designs and-choosing specific sites, they found they could attract certain species in predictable fashion. But these structures, by nature of their openness and relative lack of surface area, provide little space for colonization by encrusting plants and animals that provide food and shelter. Furthermore, many of the fishes attracted to the Japanese high relief, low surface area-to-volume reefs are pelagic, offshore species that migrate through and aggregate around these reefs but generally feed elsewhere in the open ocean. The Japanese reefs designs are generally fish attracting devices (FADS) which allow Japanese commercial fisheries to better exploit these fishes.

The sport fishes inhabiting California's reefs are primarily rock and kelp habitat dwellers, such as kelp bass, sand bass, sheephead, surfperches, and rockfishes. Like the Japanese fishes, California species are also attracted to high volume, low surface area reefs. To overcome this potential problem, DFG biologists design reefs which will not only attract fishes, but will provide them with adequate habitat for shelter, forage, growth, and reproduction, thereby, increasing fish production. Cattlemen and ecologists use the term "carrying capacity". It is used to describe the numbers and condition of individuals of a species that can live on a specific quantity of habitat. For example, ranches with irrigated pastures have a larger carrying capacity per acre for cattle than do dry land pastures. Generally, shallow ocean areas with rock reefs have higher carrying capacities for most sport fishes than nearby sandy areas.

Our goal is to increase the fish carrying capacity of selected areas. To increase carrying capacity, we attempt to mimic those areas that naturally produce and maintain greater numbers of fish and good fishing success. DFG reefs generally consist of numerous low relief rock piles placed at various water depths. Growth of giant kelp on shallow, man-made rock reefs, like Mission Beach Artificial Reef, San Diego County, increases the abundance of food and the availability of shelter. Deeper reefs, beyond depths in which kelp will grow, also provide critical and important substrate for fish production. Various rock and crevice sizes allow fishes of diverse size to find shelter and reproduce.

Since 1980, beginning with Pendleton Artificial Reef, ten large quarry rock reefs have been built from San Luis Obispo County to San Diego at an average of cost of $275,000. An additional five reefs have been constructed or augmented with concrete rubble.

Reef Construction

Artificial reef construction can be divided in four phases: site selection, permit process, contract bidding, and construction operations.

Site selection is crucial to the success of the reef. The location must meet a number of biological, physical, and social criteria, with the primary concern being minimal negative environmental impacts. No existing shellfish beds or other productive areas can be covered or damaged. However, the proposed site must have the potential for providing and supporting the plants and animals that eventually colonize the reef surface. Growth of giant kelp (*Macrocystis sp.)* on man-made reefs can benefit many of the more desirable sport fish species in the Southern California Bight. Consequently, sites that favor giant kelp growth are selected where possible. However, in order to provide a full range of habitats and forage for the widest diversity of nearshore species, reefs are also constructed in areas and at depths in which giant kelp cannot grow.

Physical conditions at the proposed site are equally important. The bottom must be hard enough to support the reef material. Sites with flat pavement bed rock or hard-packed, fine sand have proven very successful. The reefs cannot be placed in areas where they could impact shorelines or interfere with normal sand and water movement.

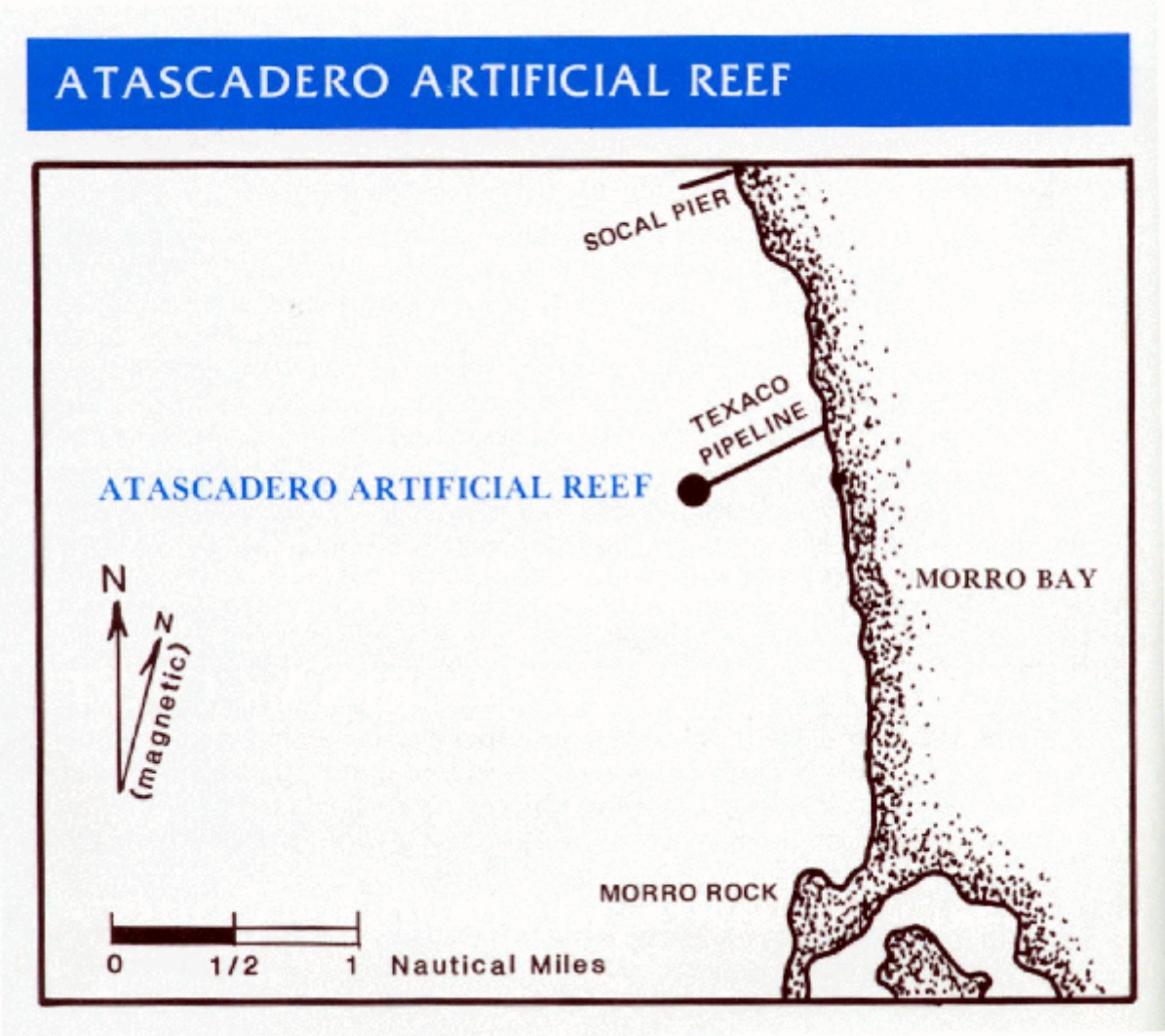
Social issues require similar consideration. The reefs must be accessible to the sportfishing public; consequently, they have to be located reasonably near boating access. At the same time, they cannot be located in navigation channels, where they might create an obstruction to vessel traffic, or where they may impact oil and gas lines, telephone cables, or other subtidal constructions. Finally, they should be placed in areas where sportfishing and commercial fishing interactions are minimized. While it is true that the increased production on and around artificial reefs is beneficial to both sport and commercial fish species, reefs may create hazards to nets and trawling gear. Site selection criteria seek to minimize negative interactions between sport and commercial fishing groups.

The artificial reef research, development, and building process is ongoing. However, new reefs can only continue to be constructed subject to the availability of funds and also can only be sited in appropriate areas. The California Department of Fish and Game is committed to supporting sport fish populations by habitat restoration and enhancement.

We hope you enjoy your visit to the reefs and that you find this publication useful in increasing your fishing success. We solicit your comments about any aspects of the reef program. The address is:

Department of Fish and Game
Nearshore Sport Fish Habitat Enhancement Program
4665 Lampson Ave., Suite C
Los Alamitos, CA 90720

The work and research described in this booklet were supported in part by Dingell-Johnson/Wallop-Breaux Federal Aid in Sport Fish Restoration Act Funds (Project F-27-D, Nearshore Sport fish Habitat Enhancement).



Center Coordinates	35'23'36" N x 120'52'32" W	**Depth**	55 ft. (MLLW)
Compass Bearing	334' (mag), 1.9 N miles from Morro Bay entrance		
Year Constructed	1985	**Area**	0.4 acres
Materials Used	3,500 tons quarry rock		
Comments	Divers have observed good concentrations of adult brown, gopher, and blue rockfish, and pile and striped surfperch around the rock piles.		

ATASCADERO ARTIFICIAL REEF

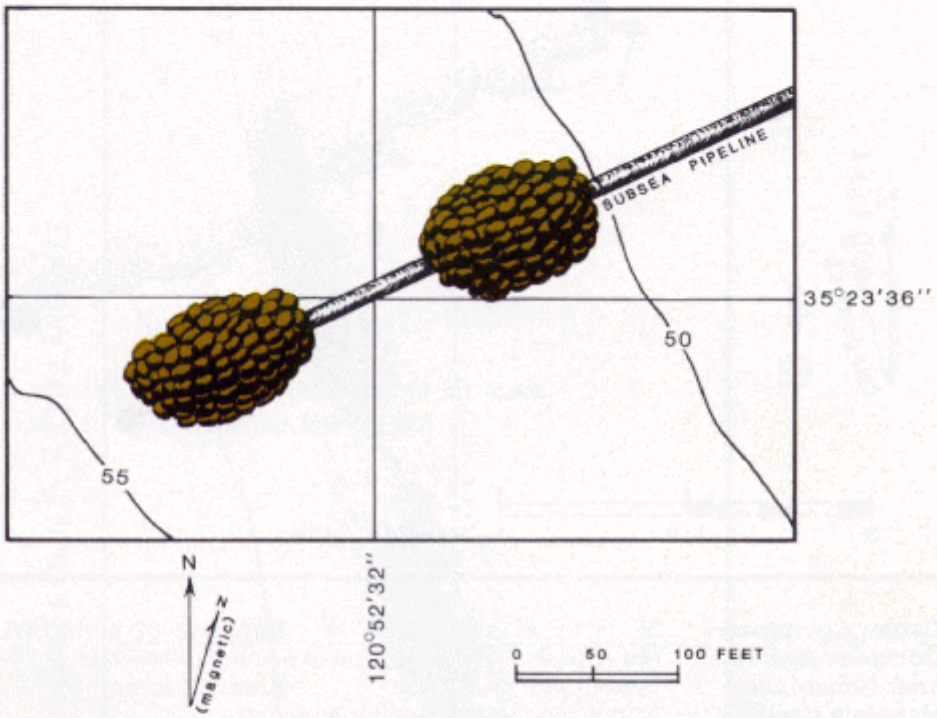
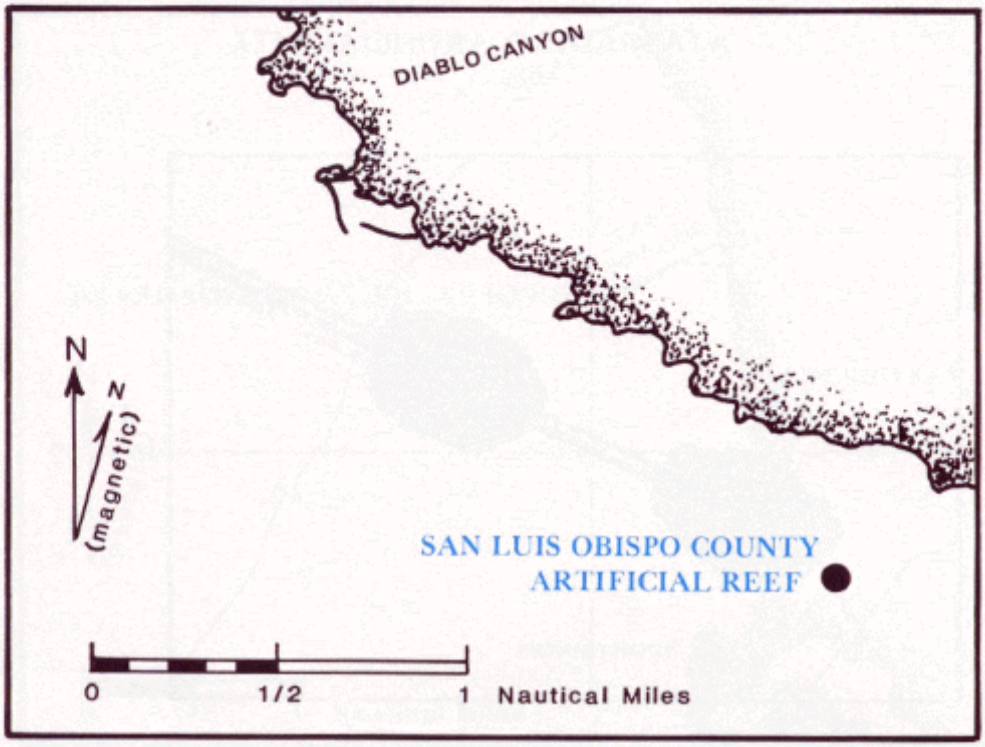


PHOTO: Peter L. Haaker

Blue rockfish are common at Atascadero Artificial Reef.

SAN LUIS OBISPO COUNTY ARTIFICIAL REEF



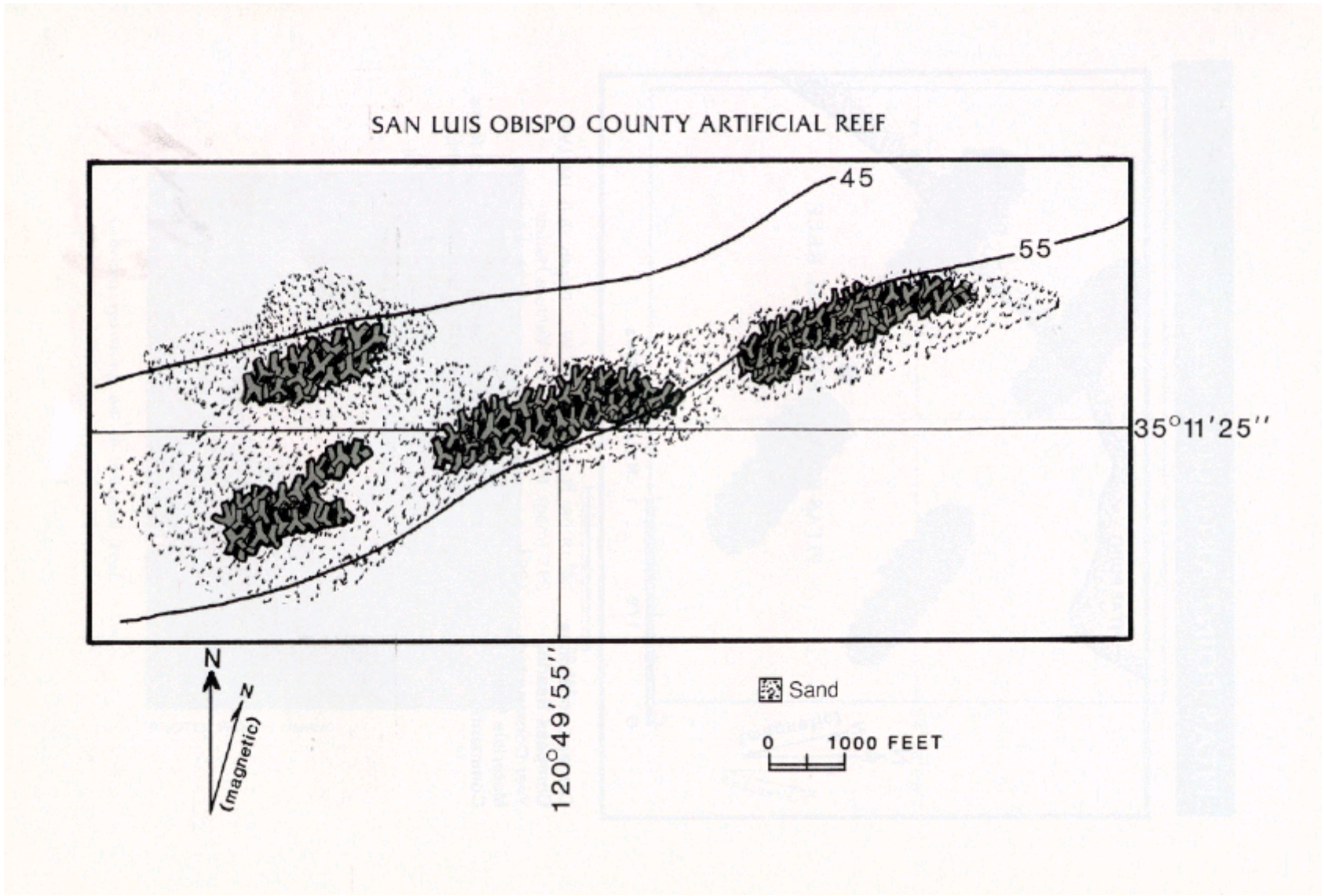
Center Coordinates 35° 11' 25" N x 120° 49' 55" W **Depth** 42–52 ft. (MLLW)
Compass Bearing Not available — no reasonable point of reference.
Year Constructed 1984–1985 **Area** 13 acres
Materials Used 27,000 tons concrete tribar and rubble
Comments Nursery ground for rockfish. Large numbers of adult blue rockfish. Very lush algae growth. Good photo opportunities for divers on days with clear water.

PHOTO: Robert de Haas

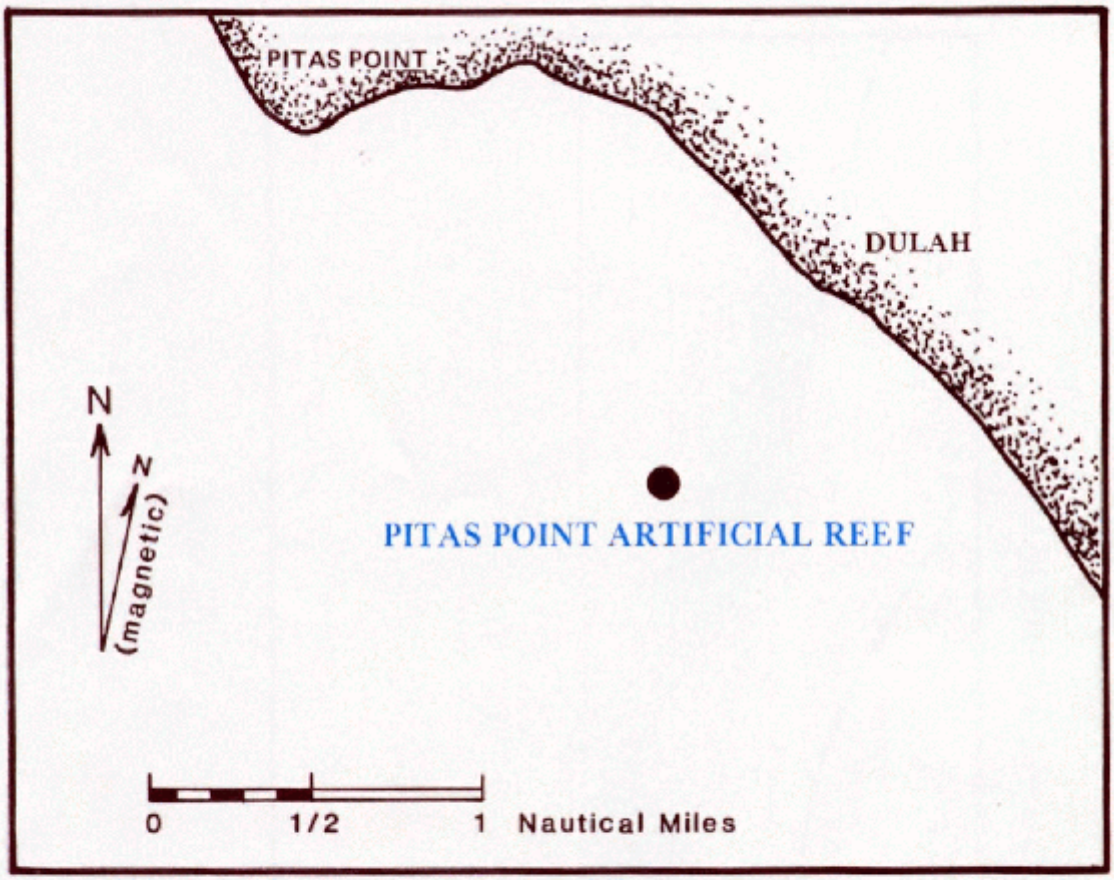
PHOTO: Robert de Haas

Diver conducting biological surveys in forest of bull kelp.

Bull kelp growing on piece of cement tribar.

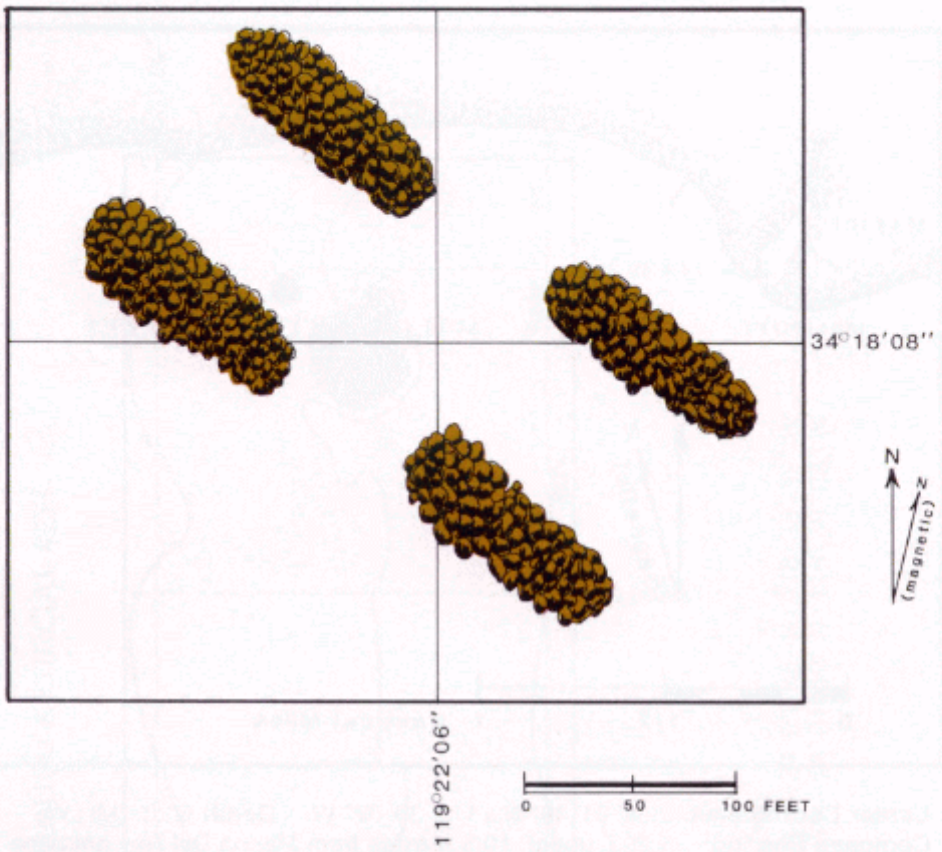

SAN LUIS OBISPO COUNTY ARTIFICIAL REEF
45
55
35°11'25''
120°49'55''
N
N
(magnetic)
Sand
0
1000 FEET

PITAS POINT ARTIFICIAL REEF



Center Coordinates	34° 18' 08" N x 119° 22' 06" W **Depth** 28 ft. (MLLW)
Compass Bearing	291° (mag), 6 N miles from Ventura Harbor
Year Constructed	1984 **Area** 1.1 acres
Materials Used	7,200 tons quarry rock
Comments	Reef supports a healthy stand of giant kelp which forms a surface canopy. Feather-boa kelp is also present, forming a lower-story canopy. Kelp bass, barred sandbass, olive and brown rockfishes and several species of surfperches are common.

PITAS POINT ARTIFICIAL REEF



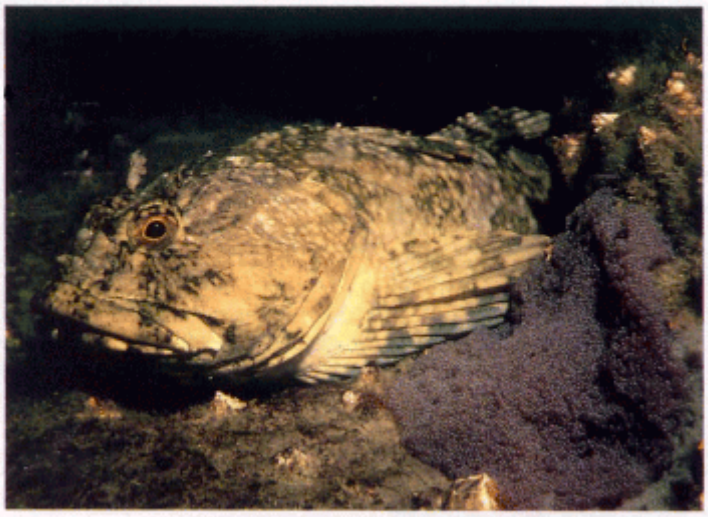
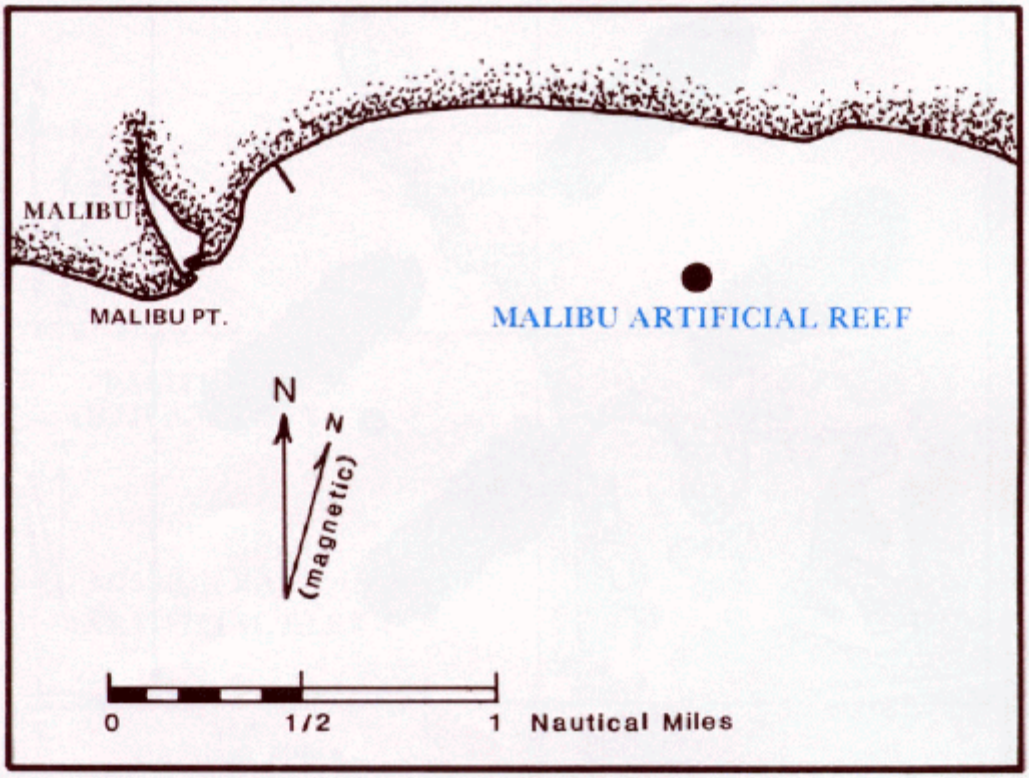


PHOTO: Peter L. Haaker

Cabezon spawning on an artificial reef.

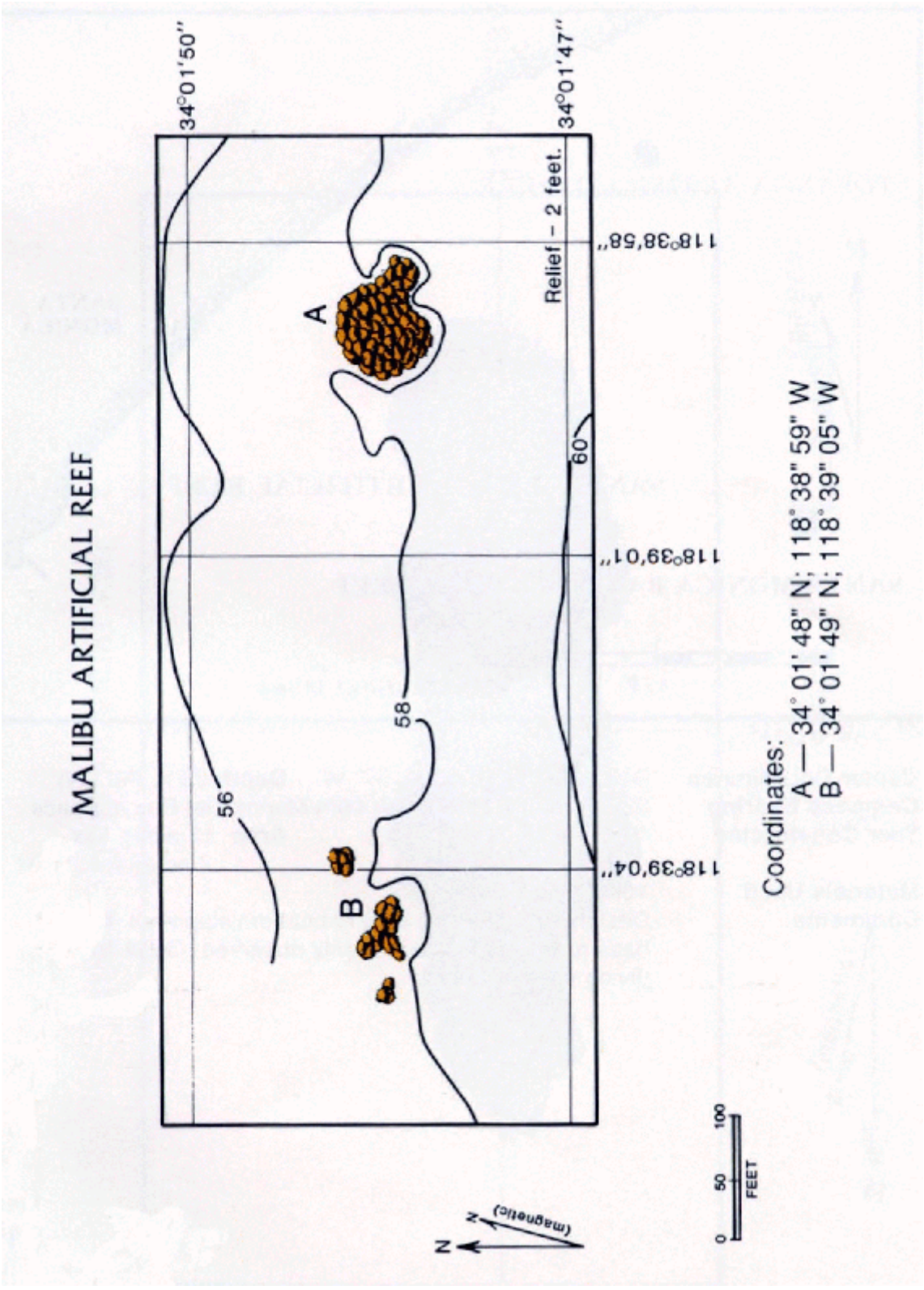
MALIBU ARTIFICIAL REEF



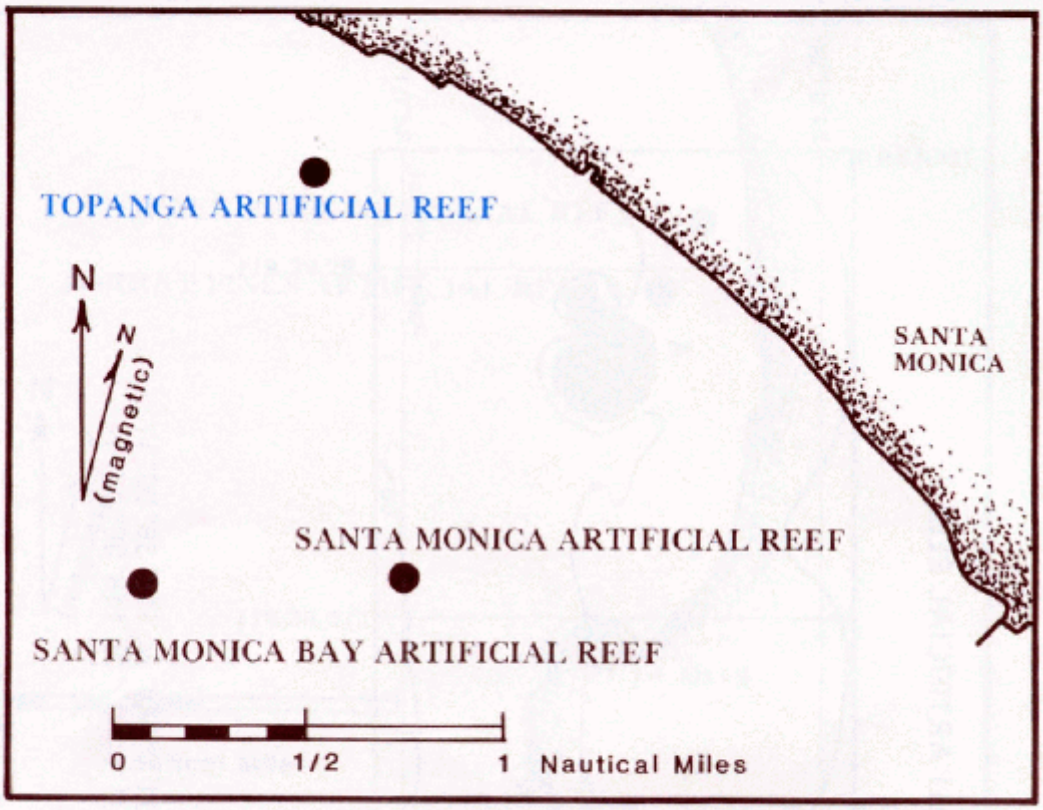
Center Coordinates	34° 01' 49" N x 118° 39' 02" W **Depth** 60 ft. (MLLW)
Compass Bearing	293° (mag), 10.5 N miles from Marina Del Rey entrance
Year Constructed	1961 **Area** 0.5 acres
Materials Used	333 tons quarry rock, 44 concrete shelter, 14 car bodies, 1 streetcar.
Comments	One of the original "replication reefs". Automobile bodies and streetcar have disintegrated. Still some good sculpin fishing in March and April.

Early DFG reef researchers examining one of the four components of Malibu Artificial Reef.

PHOTO: DFG Staff

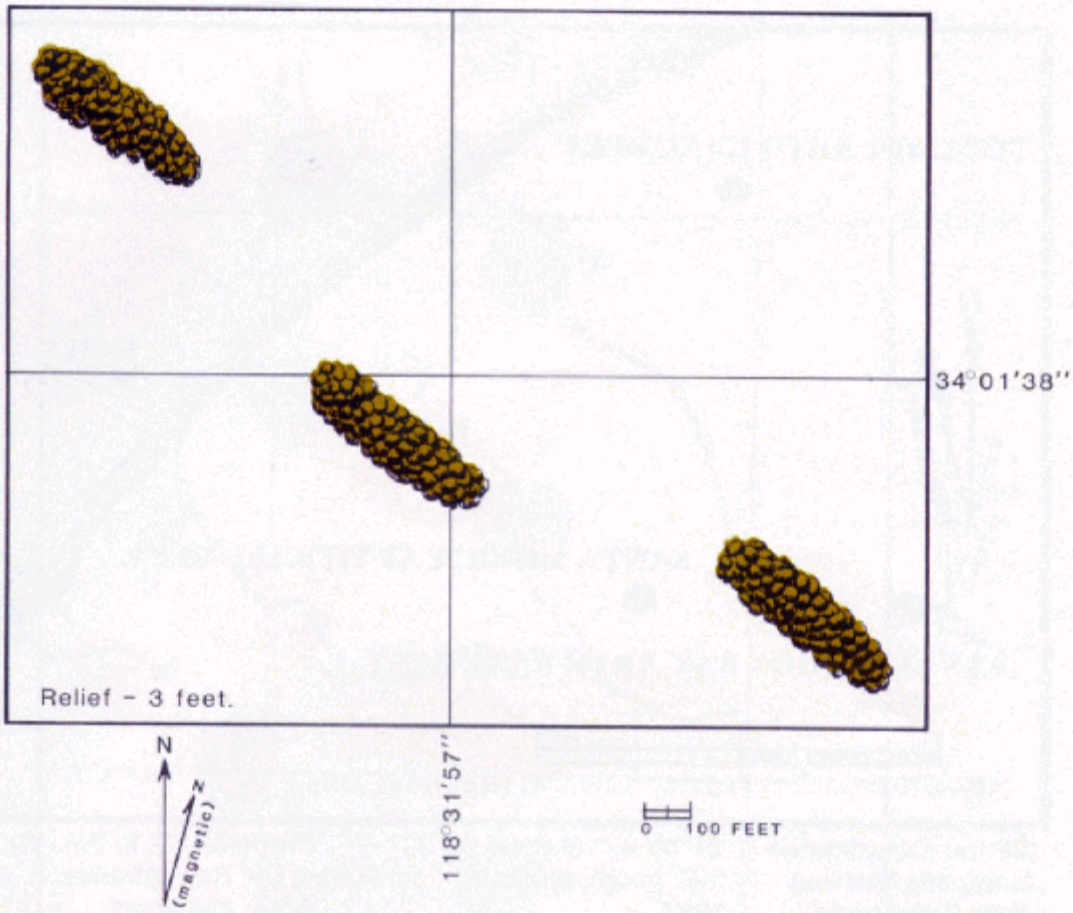

MALIBU ARTIFICIAL REEF
34°01'50"
34°01'47"
118°38'58"
118°39'01"
118°39'04"
Relief – 2 feet.
A
B
56
58
60
Coordinates:
A — 34° 01' 48" N; 118° 38" 59" W
B — 34° 01' 49" N; 118° 39" 05" W
N
(magnetic)
0
50
100
FEET

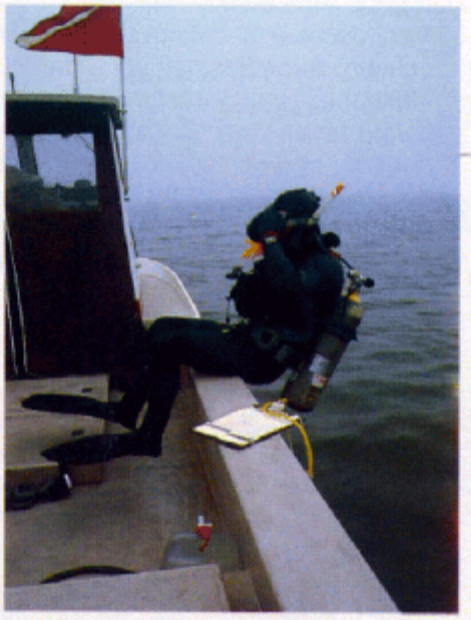
TOPANGA ARTIFICIAL REEF



Center Coordinates	34° 01' 38" N x 118° 31' 57" W	**Depth**	28 ft. (MLLW)
Compass Bearing	302° (mag), 5.25 N miles from Marina Del Rey entrance		
Year Constructed	1987	**Area**	13 acres site 2 acres rock piles
Materials Used	10,000 tons quarry rock		
Comments	Designed to promote kelp habitat development. Kelp bass and sandbass commonly observed. Good lobster diving early in season.		

TOPANGA ARTIFICIAL REEF

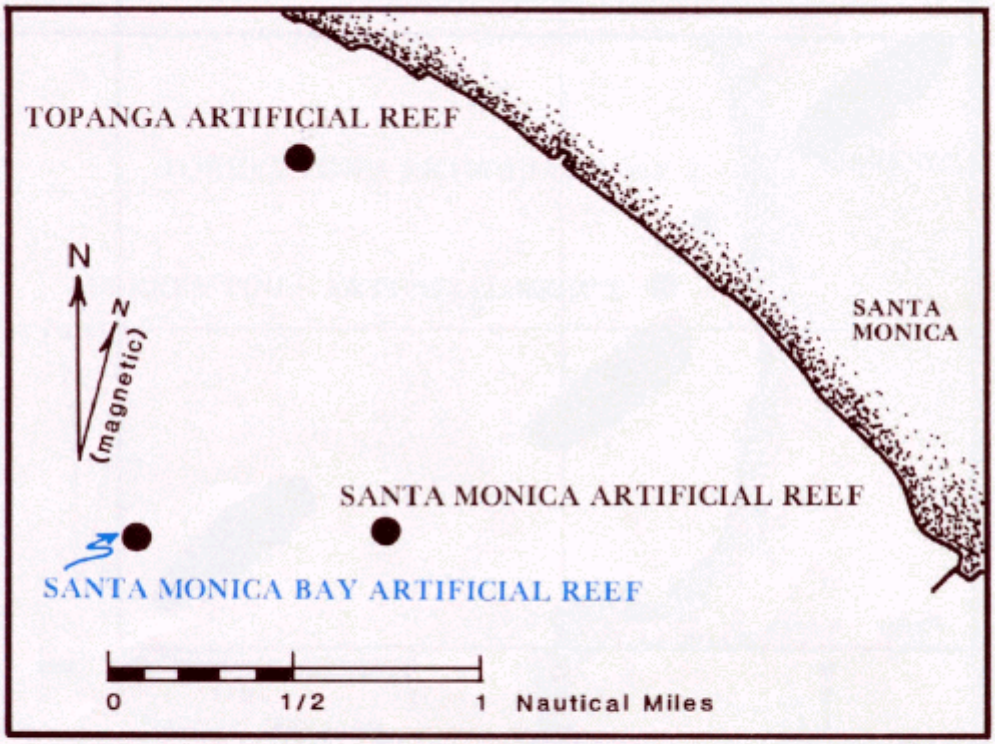




DFG biologist preparing to survey an artificial reef.

PHOTO: Kimberly K. McKee

SANTA MONICA BAY ARTIFICIAL REEF



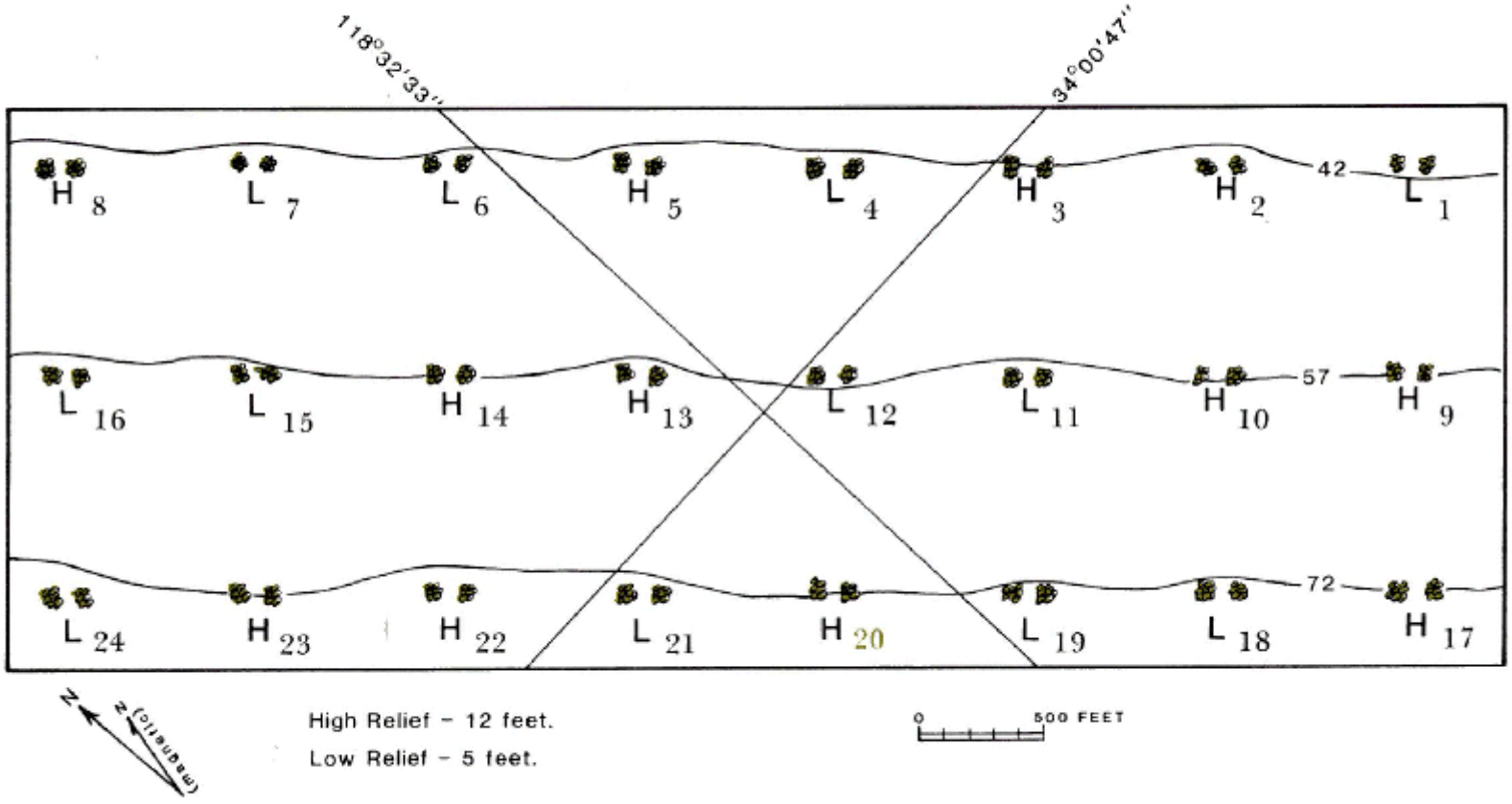
Center Coordinates	34° 00' 47" N x 118° 32' 33" W **Depth** 42–72 ft. (MLLW)
Compass Bearing	290° (mag), 5 N miles from Marina Del Rey entrance
Year Constructed	1987 **Area** 256 acres
	7 acres rock piles
Materials Used	20,000 tons quarry rock
Comments	Very successful fishing reef. March and April good for sculpin. Sand bass all year, particularly early-late fall. Halibut on sand near rockpiles early summer. Lobster diving on shallow rockpiles can be productive early in season, deeper rockpiles in January and February.

Santa Monica Bay Artificial Reef Coordinates

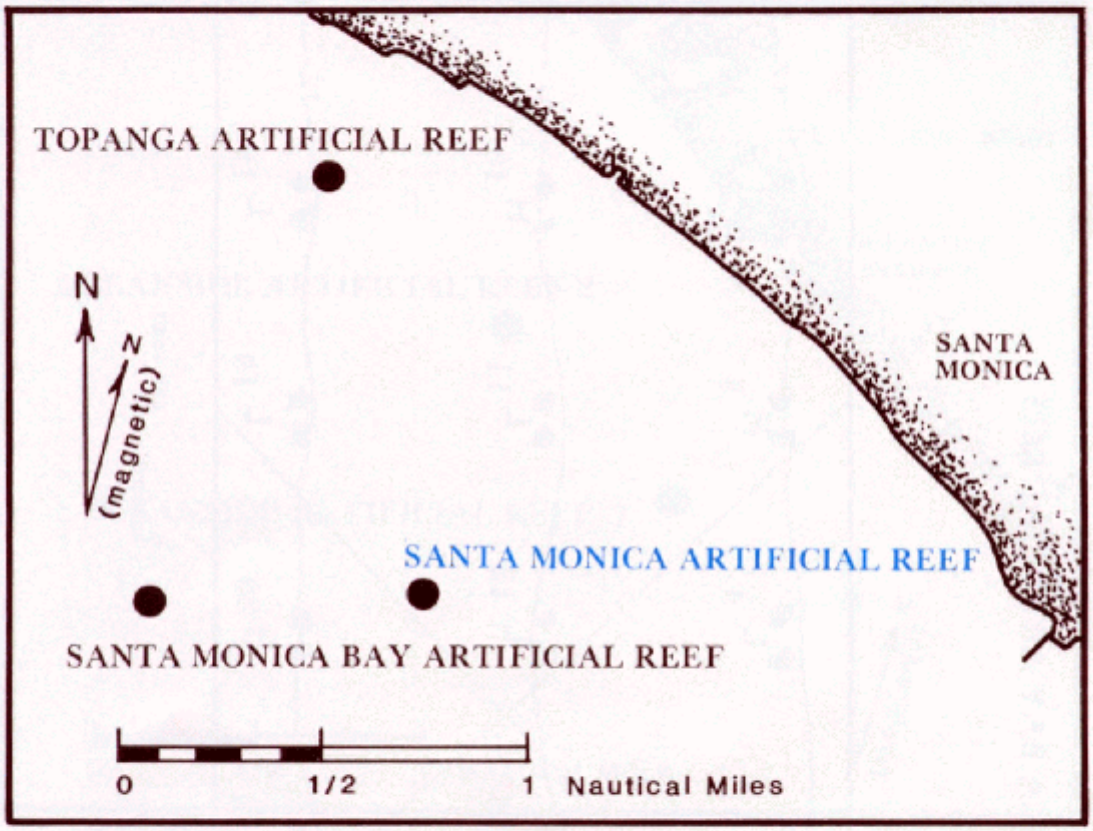
1 .not found

2. 34° 00' 51.0" N; 118° 32' 03.0" W
3. 34° 01' 02.1" N; 118° 32' 09.8" W
4. 34° 01' 05.8" N; 118° 32' 17.7" W
5. 34° 01' 10.6" N; 118° 32' 25.6" W
6. 34° 01' 19.4" N; 118° 32' 41.0" W
7. 34° 01' 22.6" N; 118° 32' 48.9" W
8. 34° 01' 16.0" N; 118° 32' 52.0" W
9. 34° 00' 29.0" N; 118° 32' 04.0" W
10. 34° 00' 36.1" N; 118° 32' 02.2" W
11. 34° 00' 41.5" N; 118° 32' 10.1" W
12. 34° 00' 42.8" N; 118° 32' 18.0" W
13. 34° 00' 47.1" N; 118° 32' 26.3" W
14. 34° 00' 50.5" N; 118° 32' 37.8" W
15. 34° 00' 50.0" N; 118° 32' 54.0" W
16. 34° 00' 57.0" N; 118° 33' 03.0" W
17. 34° 00' 09.0" N; 118° 32' 14.0" W
18. 34° 00' 17,8" N; 118° 32' 13.3" W
19. 34° 00' 17.0" N; 118° 32' 26.0" W
20.34° 00' 21.0" N: 118° 32' 37.0" W
21.34° 00' 27.0" N; 118° 32' 48.0" W
22. 34° 00' 32.0" N; 118° 32' 59.0" W
23. 34° 00' 38.0" N; 118° 33' 05.0" W
24. 34° 00' 39.0" N; 118° 33' 15.0" W

SANTA MONICA BAY ARTIFICIAL REEF



SANTA MONICA ARTIFICIAL REEF

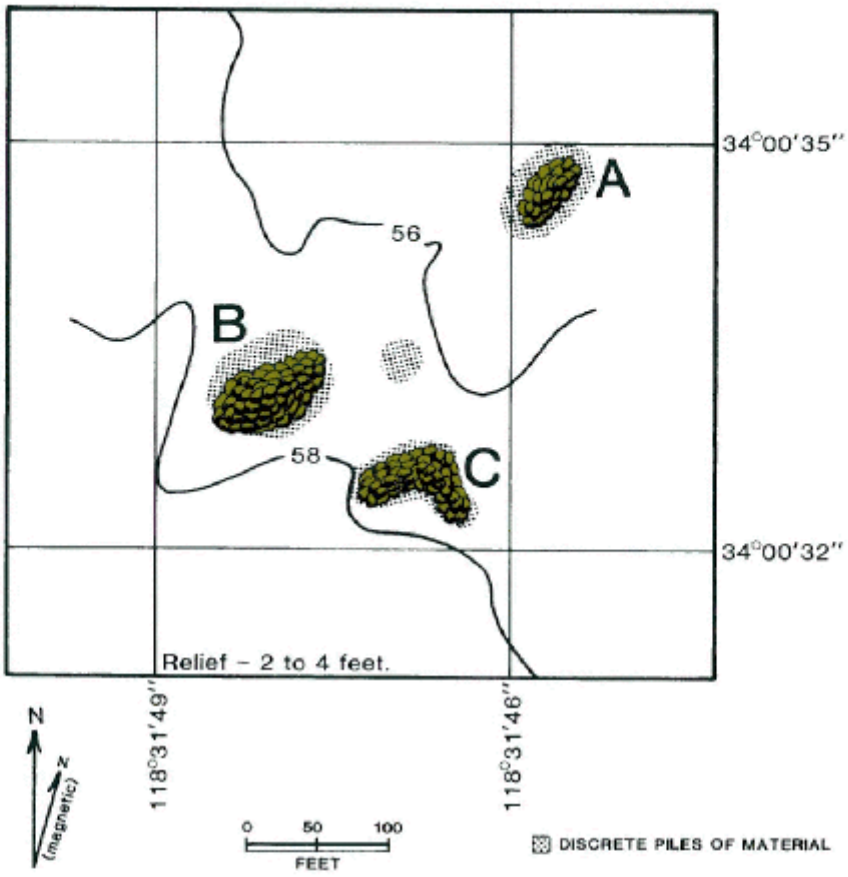


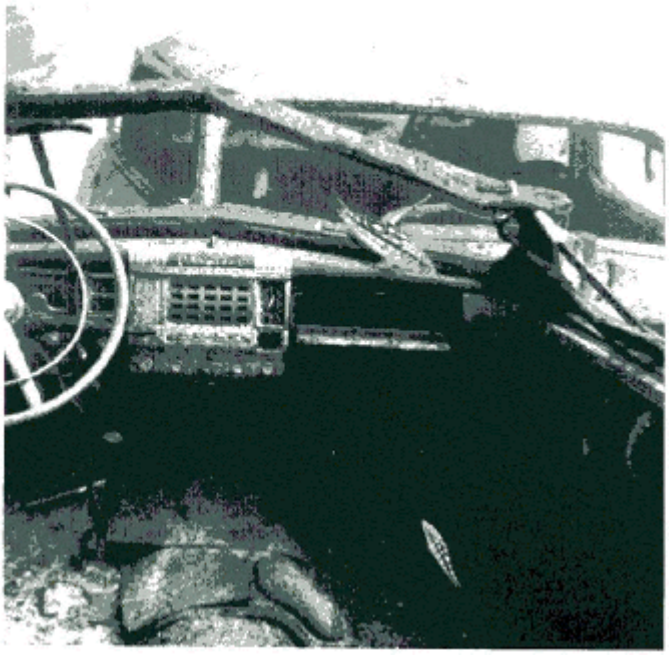
Center Coordinates	34° 00' 34" N x 118° 31' 47" W **Depth** 60 ft. (MLLW)
Compass Bearing	295° (mag), 4.5 N miles from Marina Del Rey entrance
Year Constructed	1961 (Augumented 1971) **Area** 0.5 acres
Materials Used	330 tons quarry rock, 44 concrete shelters, 4 car bodies, 1 streetcar.
Comments	An original "replication reef". Automobiles and streetcar have disintegrated. Augmented with 100 tons of pier pilings in 1971. Some sandbass in fall. Occasional good sculpin bites in spring.

Coordinates:

A - 34° 00' 34.0" N; 118° 3 l' 49.2" W
B - 34° 00' 33.0" N; 118° 3 l' 48.0" W
C - 34° 00' 33.0" N; 118° 31' 50.4" W

SANTA MONICA ARTIFICIAL REEF

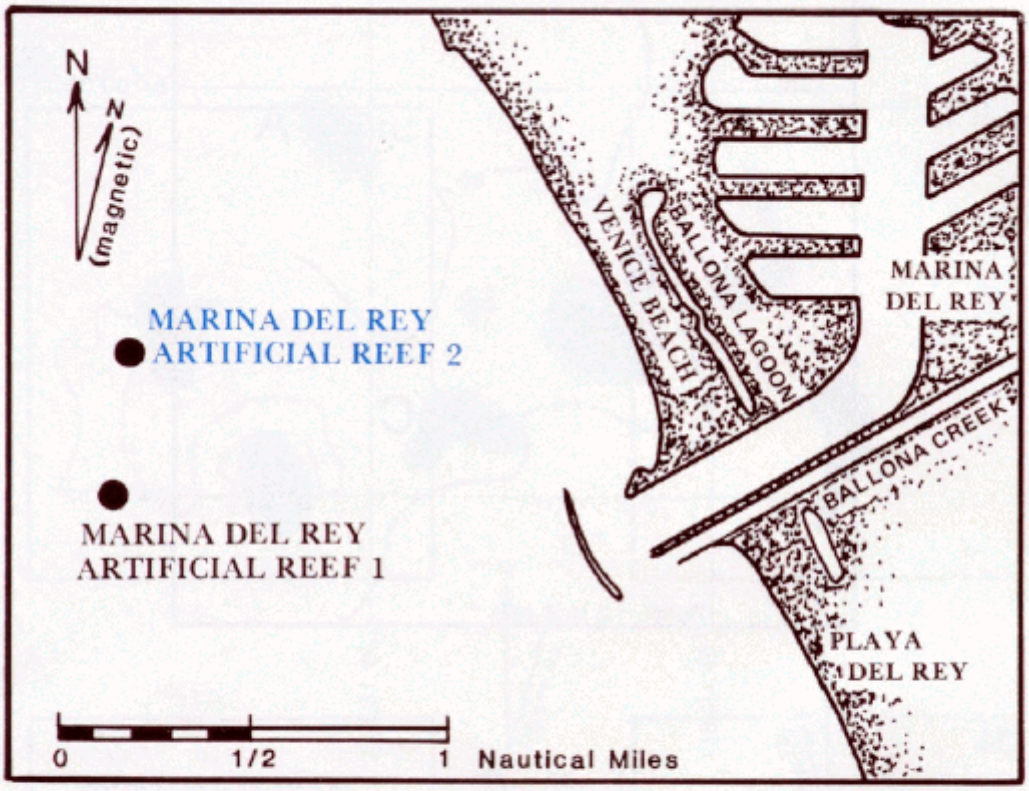




Although car bodies were inexpensive, their usefulness was limited to only a few years.

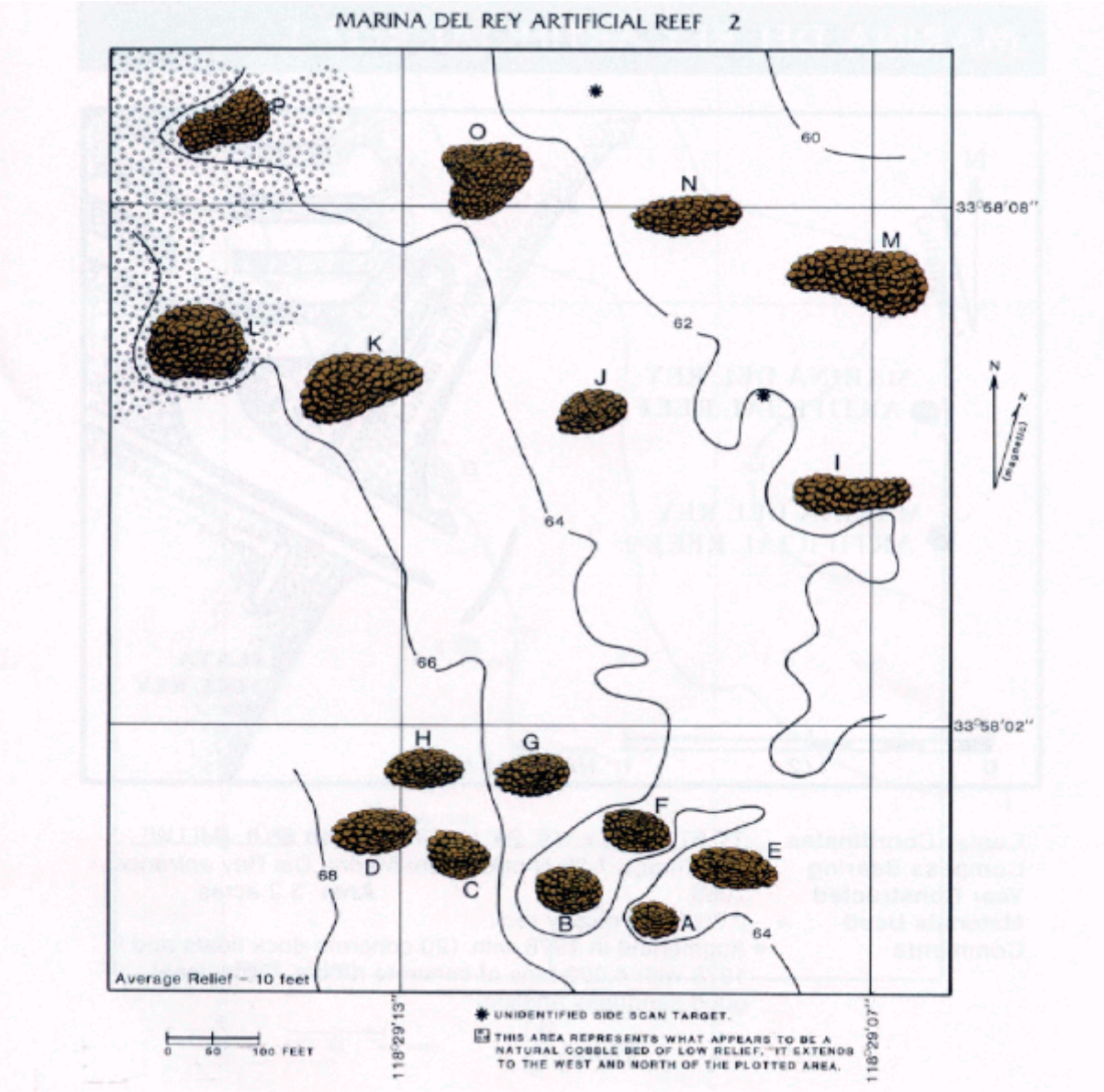
PHOTO: Charles H. Turner

MARINA DEL REY ARTIFICIAL REEF 2



Center Coordinates	33° 58' 06" N x 118° 29' 11" W **Depth** 65 ft. (MLLW)
Compass Bearing	270° (mag), 1.25 N miles from Marina Del Rey entrance
Year Constructed	1985 **Area** 6.9 acres
Materials Used	10,000 tons quarry rock
Comments	Few fish seen during summer observation dives. However, anglers report occasional good catches of sandbass and sculpin.

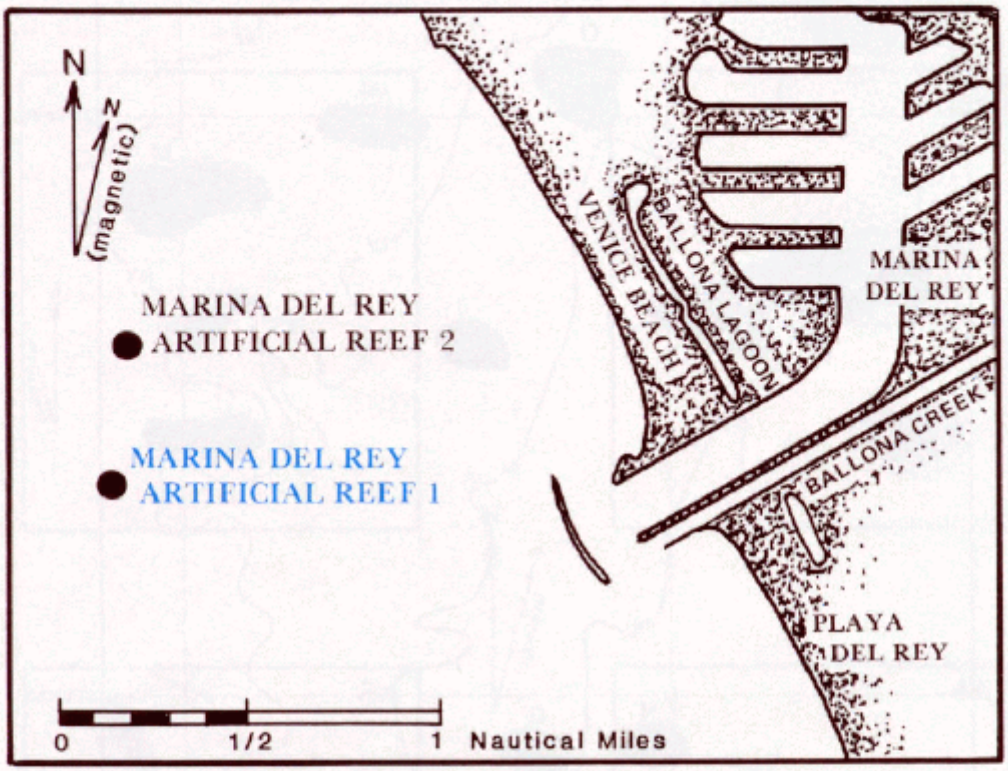
Notes



Coordinates:

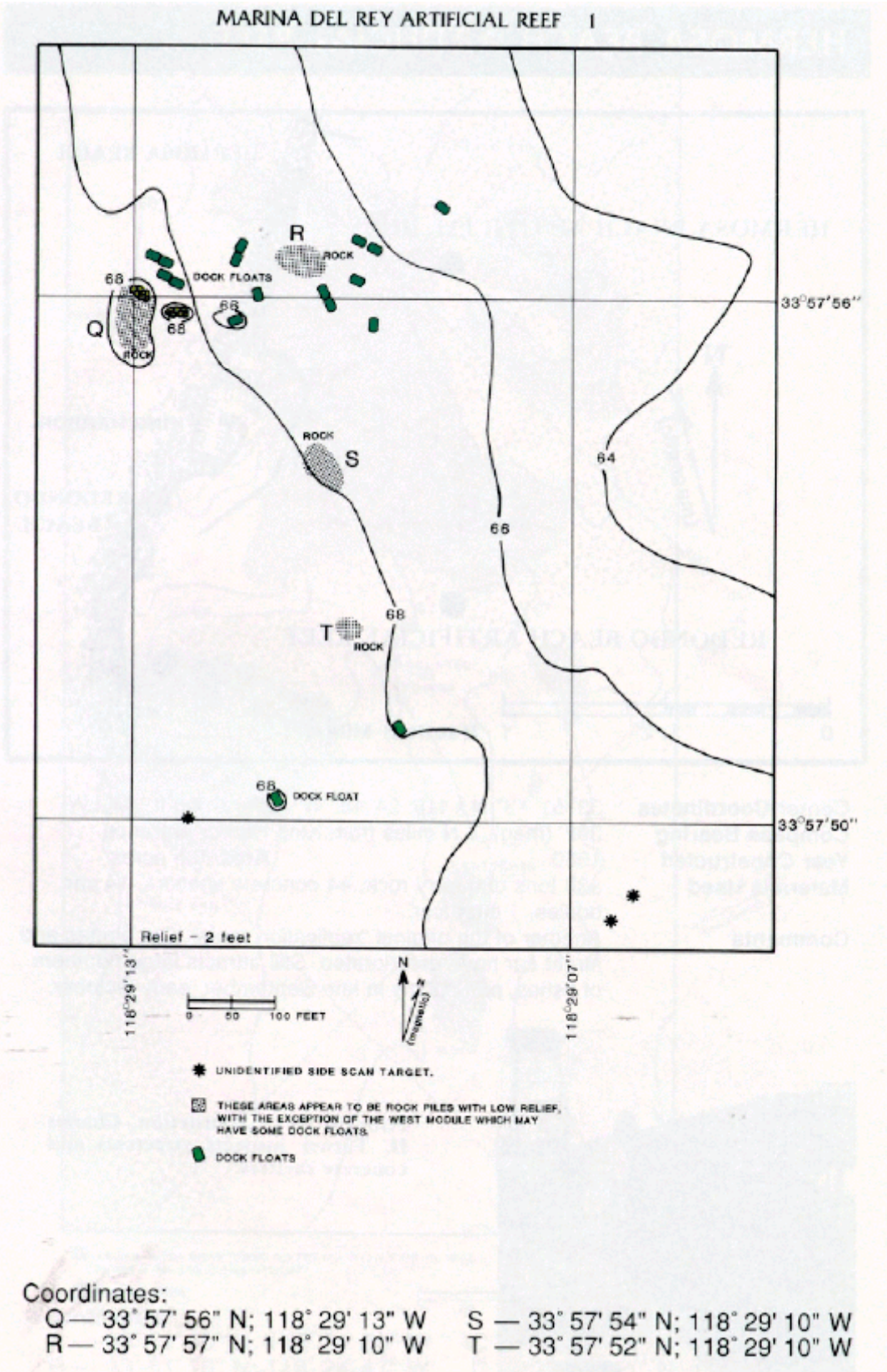
A - 33° 58' 00.0" N; 118° 29' 10.0" W	I - 33° 58' 05.0" N; 118° 29 '07.0" W
B - 33° 58' 00.2" N; 118° 29' 11.0" W	J - 33° 58' 06.0" N; 118° 29' 11.0" W
C - 33° 58' 00.1" N; 118° 29' 12.0" W	K - 33° 58' 07.0" N; 118° 29' 14.0" W
D - 33° 58' 01.0" N; 118° 29' 13.0" W	L - 33° 58' 07.0" N; 118° 29' 16.0" W
E - 33° 58' 00.5" N; 118° 29' 09.0" W	M - 33° 58' 08.0" N; 118° 29' 07.0" W
F - 33° 58' 01.0" N; 118° 29' 10.0" W	N - 33° 58' 08.0" N; 118° 29' 10.0" W
G - 33° 58' 01.5" N; 118° 29' 12.0" W	0 - 33° 58' 09.0" N; 118° 29' 12.0" W
H - 33° 58' 02.0" N; 118° 29' 13.0" W	P - 33° 58' 09.0" N; 118° 29' 15.0" W

MARINA DEL REY ARTIFICIAL REEF 1



Center Coordinates	33° 57' 54" N x 118° 29' 10" W **Depth** 65 ft. (MLLW)
Compass Bearing	252° (mag), 1.25 N miles from Marina Del Rey entrance
Year Constructed	1965 **Area** 3.2 acres
Materials Used	2,000 tons quarry rock
Comments	Augmented in 1976 with 120 concrete dock floats and in 1978 with 4,000 tons of concrete rubble. Occasional good sandbass angling.

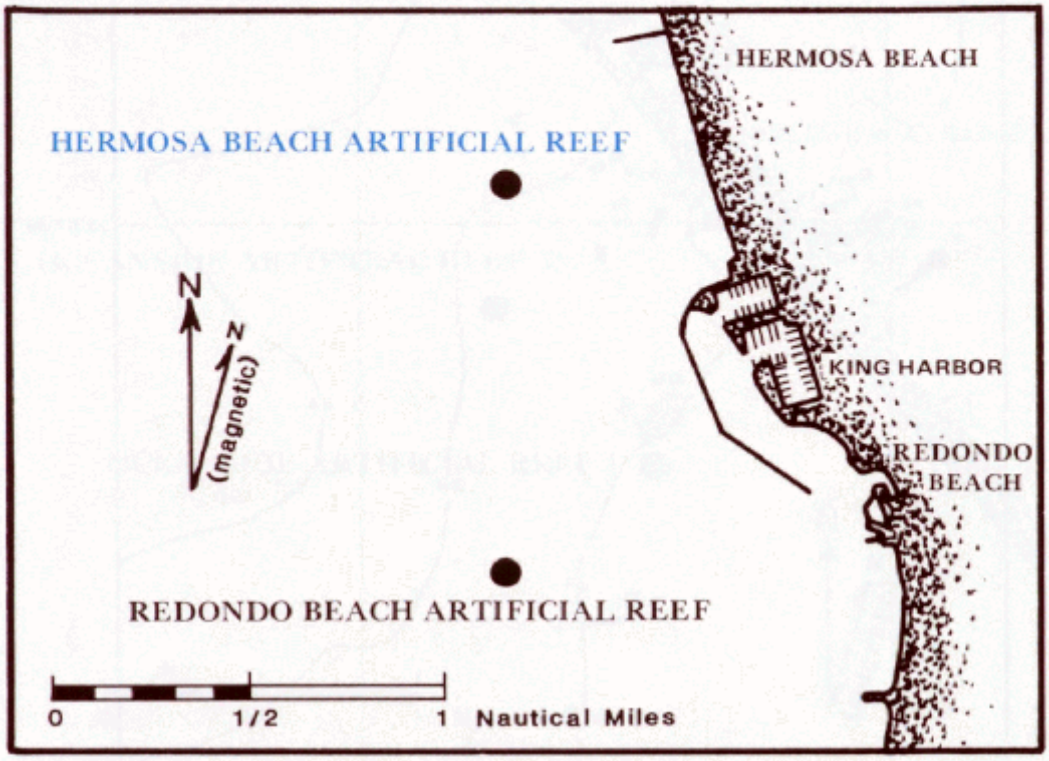
Notes



Coordinates:

Q — 33° 57' 56" N; 118° 29' 13" W
R — 33° 57' 57" N; 118° 29' 10" W
S — 33° 57' 54" N; 118° 29' 10" W
T — 33° 57' 52" N; 118° 29' 10" W

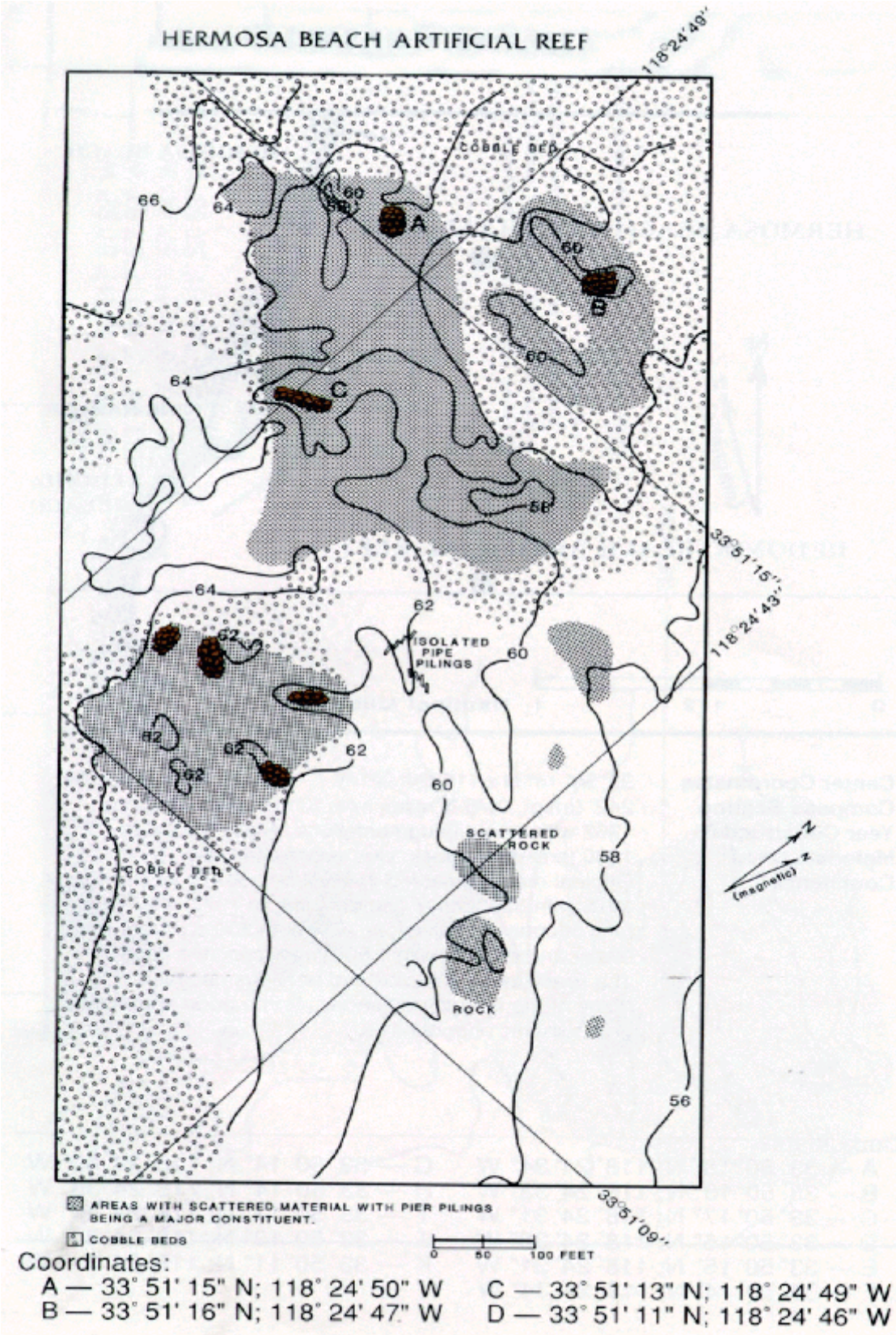
HERMOSA BEACH ARTIFICIAL REEF



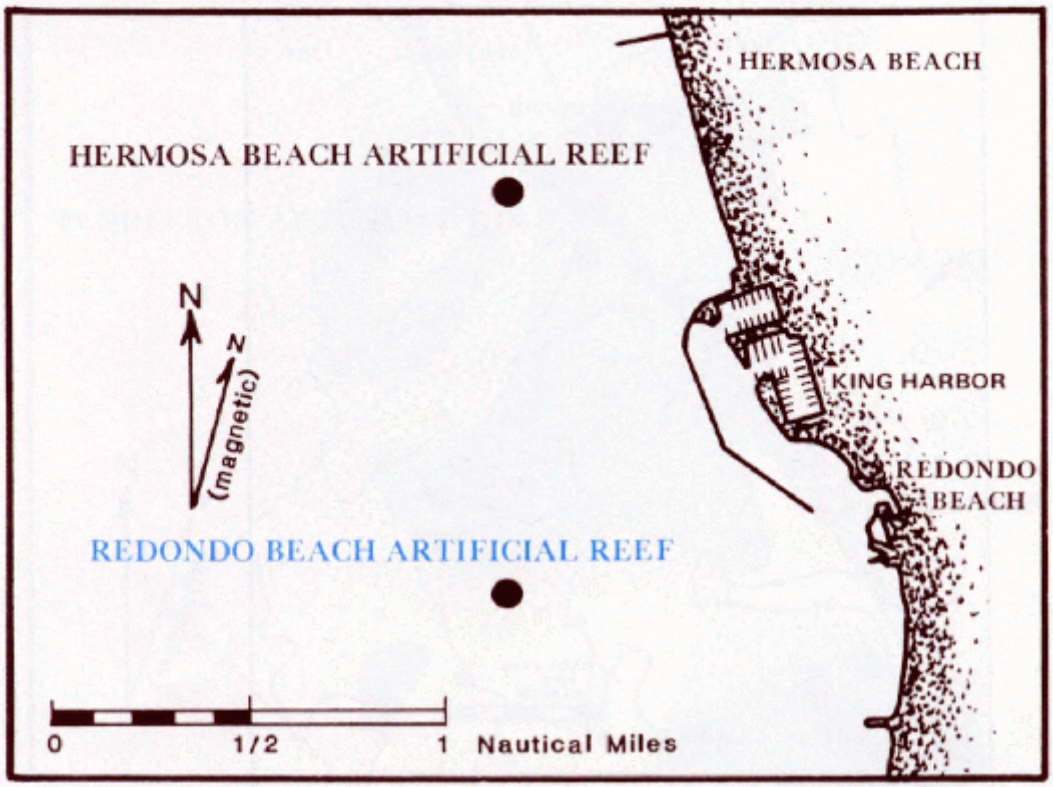
Center Coordinates	33° 51' 13" N x 118° 24' 48" W	**Depth**	60 ft. (MLLW)
Compass Bearing	302° (mag), 1 N miles from King Harbor entrance		
Year Constructed	1960	**Area**	0.5 acres
Materials Used	330 tons of quarry rock, 44 concrete shelters, 14 car bodies, 1 streetcar.		
Comments	Another of the original "replication reefs". Car bodies and street car have deteriorated. Still attracts large numbers of fishes, particularly in late September, early October.		

Prior to reef construction, Charles H. Turner inspects streetcars and concrete shelters.

PHOTO: Earl E. Ebert


HERMOSA BEACH ARTIFICIAL REEF
118°24'49"
COBBLE BED
66
64
60
58
A
B
C
62
ISOLATED PIPE PILINGS
SCATTERED ROCK
ROCK
56
33°51'15"
118°24'43"
33°51'09"
(magnetic)
AREAS WITH SCATTERED MATERIAL WITH PIER PILINGS BEING A MAJOR CONSTITUENT.
COBBLE BEDS
0 50 100 FEET
Coordinates:
A — 33° 51' 15" N; 118° 24' 50" W
B — 33° 51' 16" N; 118° 24' 47" W
C — 33° 51' 13" N; 118° 24' 49" W
D — 33° 51' 11" N; 118° 24' 46" W

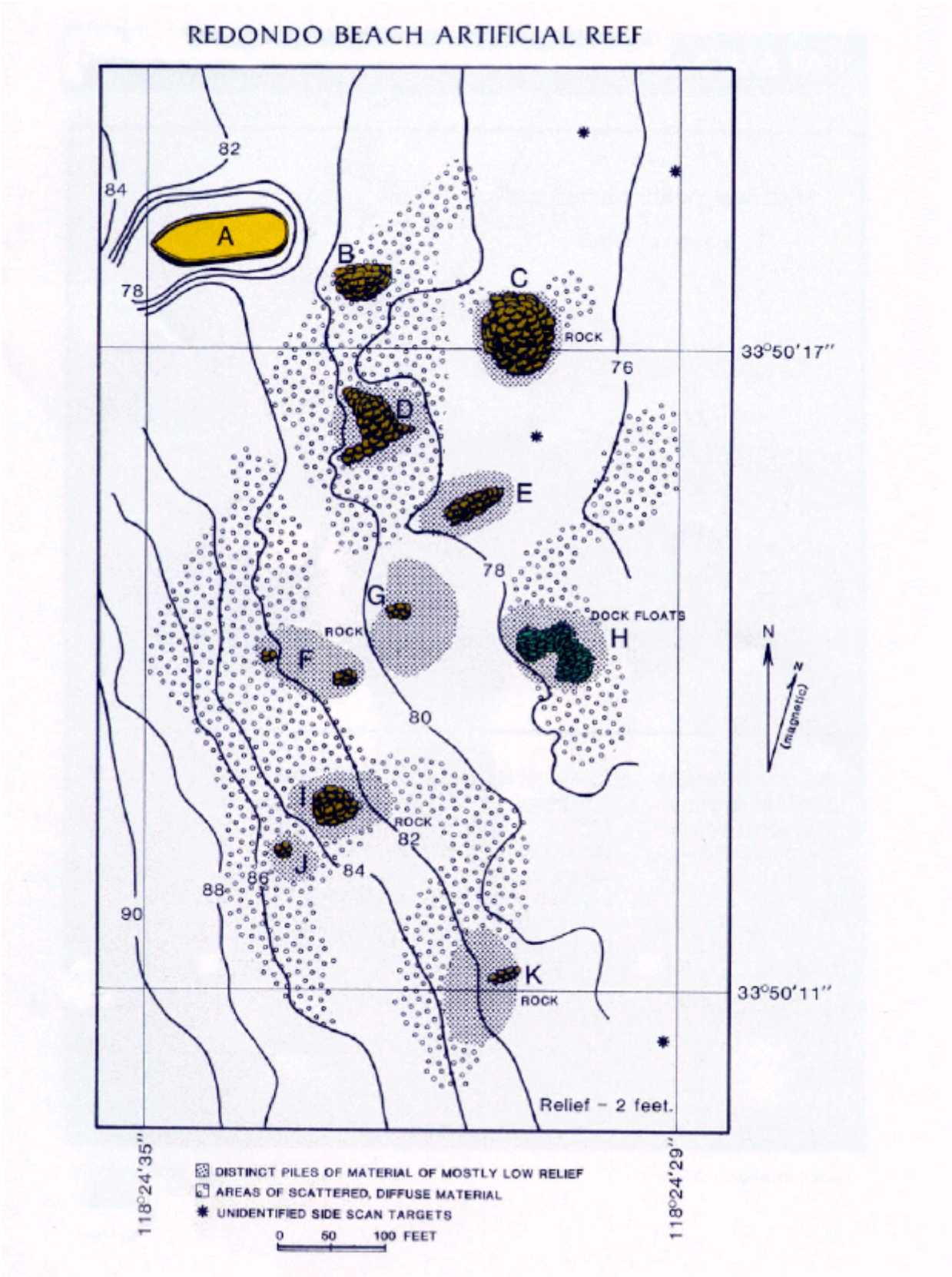
REDONDO BEACH ARTIFICIAL REEF



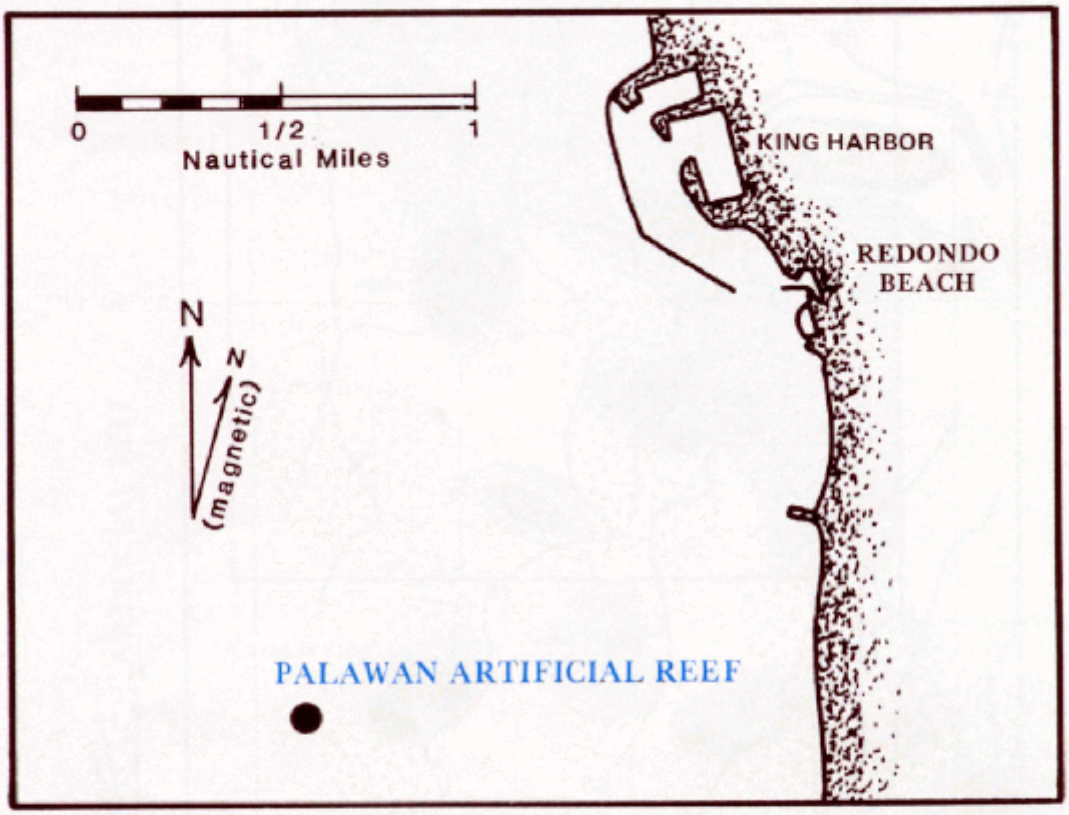
Center Coordinates 33° 50' 14" N x 118° 24' 32" W **Depth** 72 ft. (MLLW)
Compass Bearing 242° (mag), 0.75 N miles from King Harbor entrance
Year Constructed 1962 with several augmentations. **Area** 1.6 acres
Materials Used 1000 tons quarry rock, plus augmentations.
Comments Original reef augmented in 1974 by addition of a barge, in 1975 with 350 tons of cement pipe, in 1976 with 700 tons of concrete pilings, in 1978 with 200 concrete dock floats, and in 1979 with 1,500 more concrete floats. The reef is quite complex and provides habitat for many of the nearshore species. Some good underwater photographic opportunities.

Coordinates:

A — 33° 50' 18" N; 118° 24' 34" W
B — 33° 50' 18" N; 118° 24' 33" W
C — 33° 50' 17" N; 118° 24' 31" W
D — 33° 50' 16" N; 118° 24' 33" W
E — 33° 50' 15" N; 118° 24' 31" W
F — 33° 50' 14" N; 118° 24' 34" W
G — 33° 50' 14" N; 118° 24' 32" W
H — 33° 50' 14" N; 118° 24' 30" W
I — 33° 50' 13" N; 118° 24' 33" W
J — 33° 50' 12" N; 118° 24' 34" W
K — 33° 50' 11" N; 118° 24' 31" W


REDONDO BEACH ARTIFICIAL REEF
82
84
78
A
B
C
ROCK
33°50'17"
76
D
E
78
G
ROCK
F
DOCK FLOATS
H
80
N
(magnetic)
I
ROCK
82
J
84
86
88
90
K
ROCK
33°50'11"
Relief – 2 feet.
118°24'35"
118°24'29"
DISTINCT PILES OF MATERIAL OF MOSTLY LOW RELIEF
AREAS OF SCATTERED, DIFFUSE MATERIAL
UNIDENTIFIED SIDE SCAN TARGETS
0 50 100 FEET

PALAWAN ARTIFICIAL REEF



Center Coordinates 33° 49' 25" N x 118° 24' 53" W **Depth** 120 ft. (MLLW)
Compass Bearing 209° (mag), 2.5 N miles from King Harbor entrance
Year Constructed 1977 **Area** 0.6 acres
Materials Used Sunken liberty ship "PALAWAN"
Comments Vessel topsides has collapsed leaving the hull standing on a sand bottom. Department of Fish and Game biologists have made numerous dives on the wreck. Few species of fish have been observed in large numbers. Occasional large halibut have been noted on the sand around the hull.

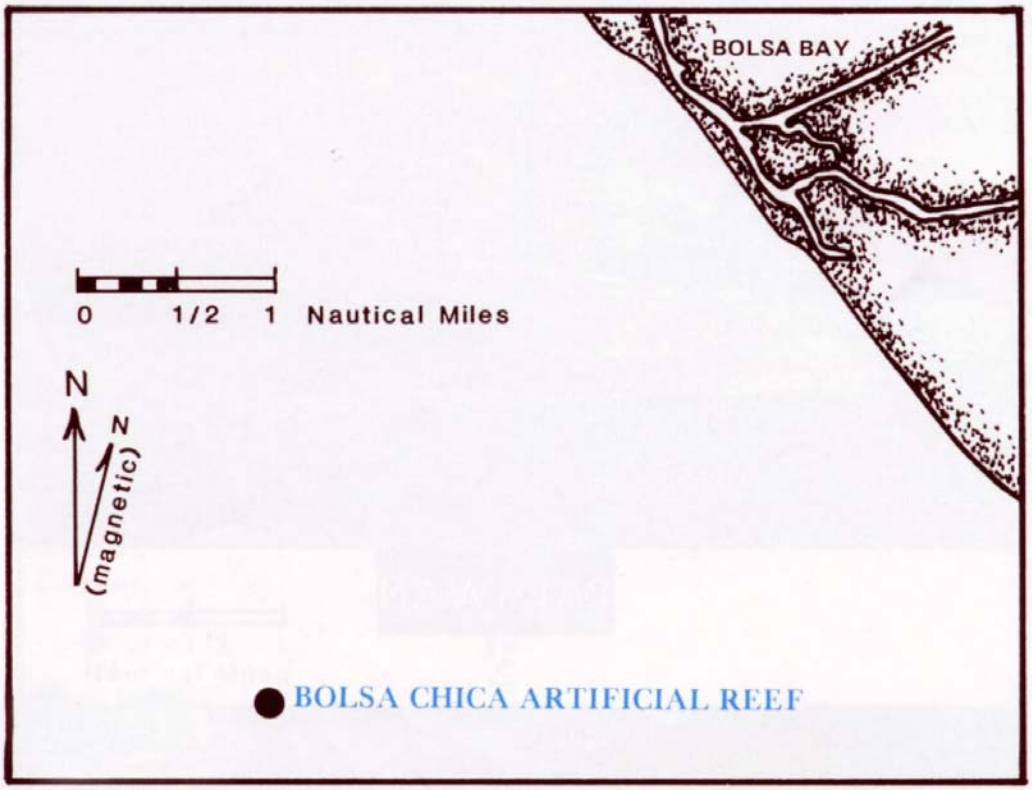
Notes

PALAWAN

PHOTO: DFG Staff

Anglers fishing off a commercial passenger fishing vessel.

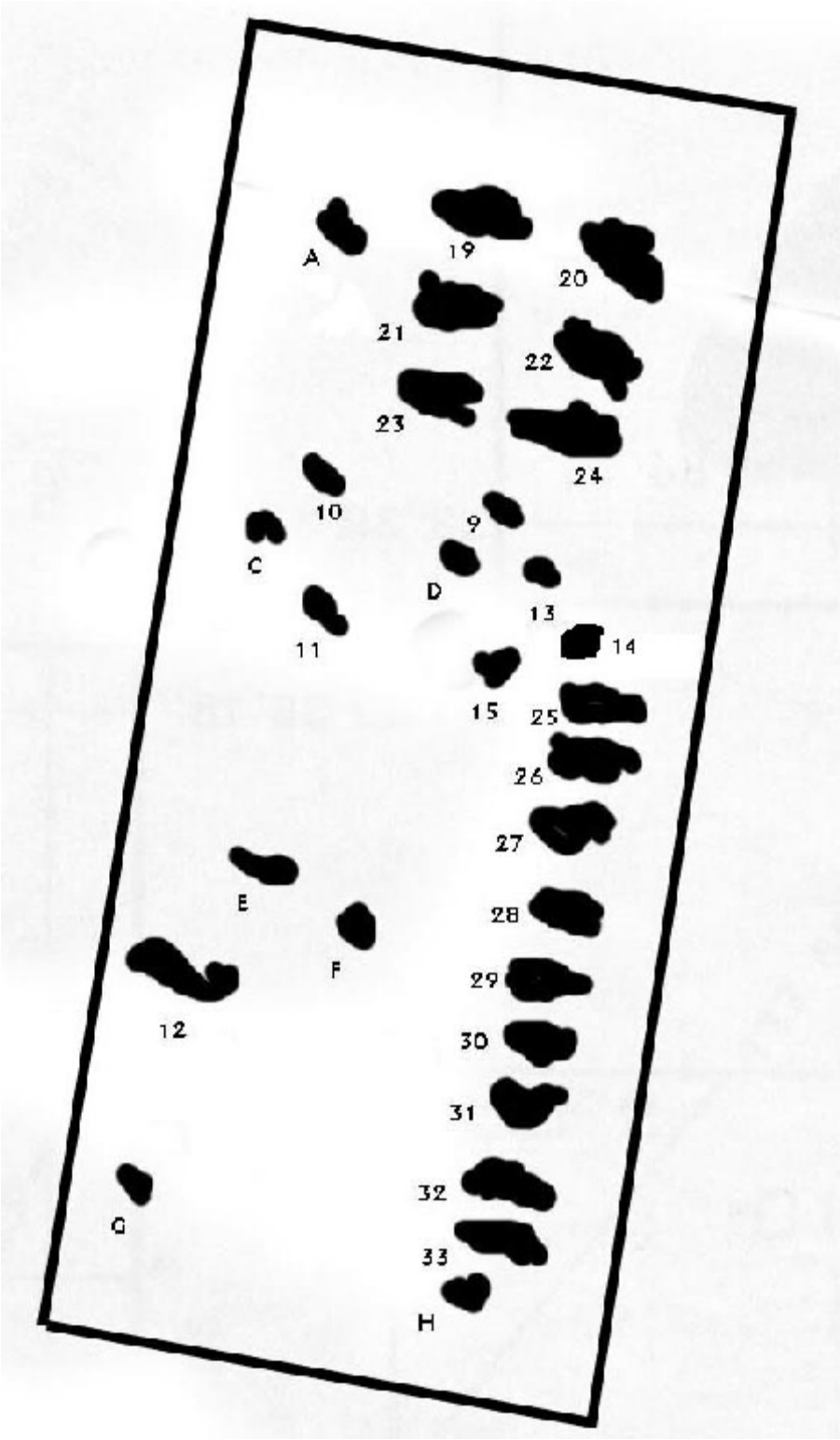
BOLSA CHICA ARTIFICIAL REEF



Center Coordinates	33° 39' 02" N x 118° 06' 05" W **Depth** 85-100 ft. (MLLW)
Compass Bearing	156° (mag), from Alamitos Bay at 5.25 N miles. 170° (mag) from Anaheim Bay entrance at 4.5 N mile.
Year Constructed	1986 - present **Area** 220 acres
Materials Used	140,000 tons concrete rubble, quarry rock, 8 steel and concrete barges.
Comments	Exceptional sculpin fishing in March and April. Good white croaker catches reported. Not a good dive location due to the usually bad visibility on the bottom.

Notes

Bolsa Chica Artificial Reef



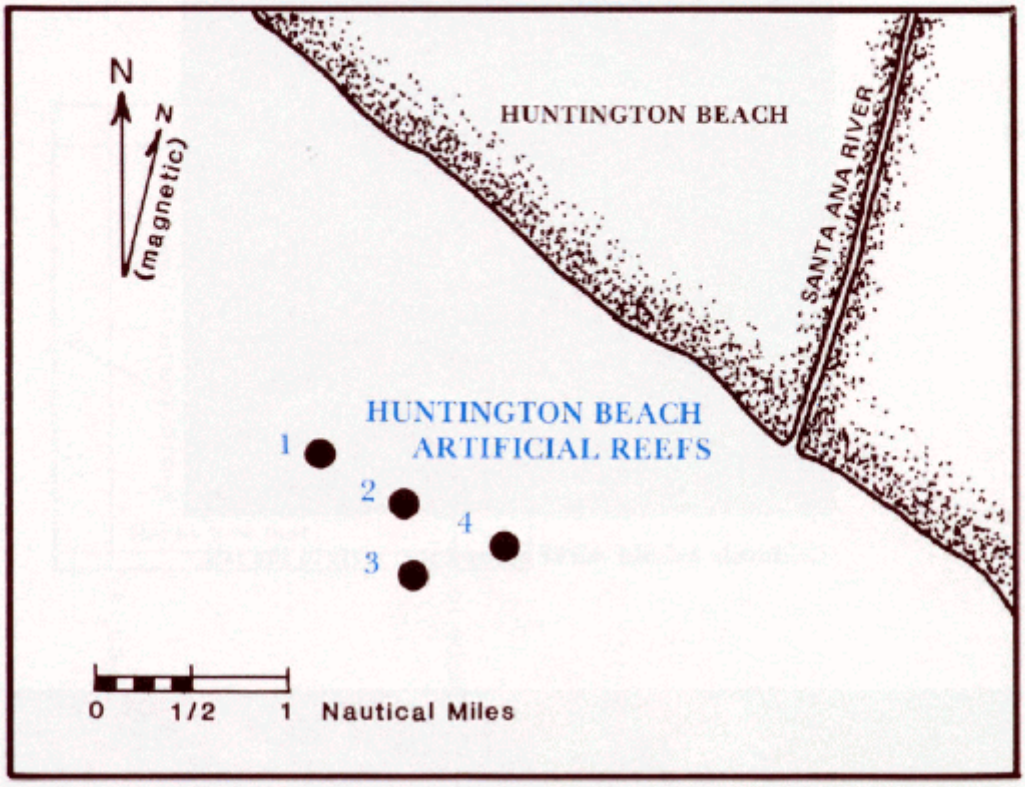
Edison light poles 3 months after placement at Bolsa Chica Artificial Reef.

Coordinates:

A - 33° 39' 32.9" N; 118° 06' 02.9" W
B - not found
C - 33° 39' 17.2" N; 118° 06' 07.7" W
D - 33° 39' 15.7" N; 118° 05' 58.1" W
9 - 33° 38' 19.0" N; 118° 05' 56.4" W
11 - 33° 39' 13.0" N; 118° 06' 04.4" W
13 - 33° 39' 15.0" N; 118° 05' 50.0" W
15 - 33° 39' 18.0" N; 118° 06' 11.0" W
17 - 33° 39' 13.0" N; 118° 06' 10.0" W
19 - 33° 39' 32.4" N; 118° 05' 55.5" W
21 - 33° 39' 29.2" N; 118° 05' 57.1" W
23 - 33° 39' 26.2" N; 118° 05' 58.0" W
25 - 33° 39' 06.7" N; 118° 05' 54.8" W
27 - 33° 39' 02.0" N; 118° 05' 56.9" W
29 - 33° 38' 56.7" N; 118° 05' 58.7" W
31 - 33° 38' 52.0" N; 118° 06' 01.1" W
33 - 33° 38' 46.4" N; 118° 06' 02.9" W

E - 33° 39' 01.2" N; 118° 06' 10.1" W
F - 33° 38' 58.7" N; 118° 06' 06.3" W
G - 33° 38' 48.7" N; 118° 06' 20.6" W
H - 33° 38' 42.8" N; 118° 06' 06.4" W
10 - 33° 39' 19.6" N; 118° 06' 03.7" W
12 - 33° 38' 58.0" N; 118° 06' 17.5" W
14 - 33° 39' 21.0" N; 118° 06' 08.0" W
16 - 33° 39' 15.0" N; 118° 06' 12.0" W
18 - 33° 39' 10.3" N; 118° 05' 59.5" W
20 - 33° 39' 29.7" N; 118° 05' 48.2" W
22 - 33° 39' 26.8" N; 118° 05' 49.2" W
24 - 33° 39' 24.2" N; 118° 05' 50.6" W
26 - 33° 39' 04.1" N; 118° 05' 55.9" W
28 - 33° 38' 59.2" N; 118° 05' 57.5" W
30 - 33° 38' 54.4" N; 118° 05' 59.6" W
32 - 33° 38' 48.9" N; 118° 06' 01.5" W

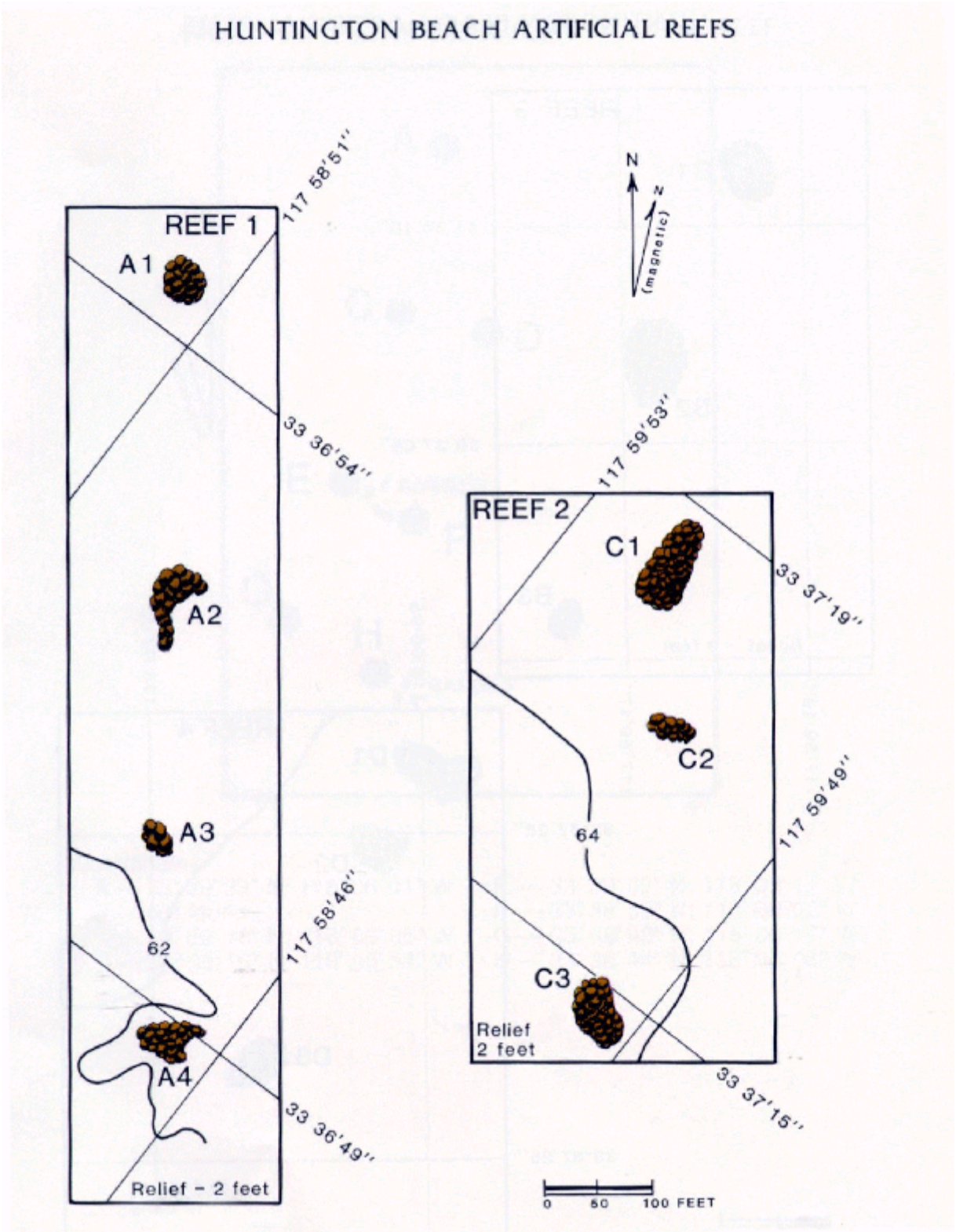
HUNTINGTON BEACH ARTIFICIAL REEFS



Center Coordinates	See comments	**Depth** 60 ft. (MLLW)
Compass Bearing	261° (mag), 6 N miles from end of Newport Jetty	
Year Constructed	1963	**Area** 3.67 acres
Materials Used	Each reef consists of 1,000 tones of quarry rock	
Comments	Reef # 1 — 33° 37' 27" N x 118° 00" 04" W	
	Reef # 2 — 33° 37' 17" N x 117° 59" 51" W	
	Reef # 3 — 33° 37' 09" N x 117° 59" 17" W	
	Reef # 4 — 33° 36' 51" N x 117° 58" 49" W	

Coordinates:

A1 — 33° 36' 55" N; 117° 58' 51" W	C1 — 33° 37' 18" N; 117° 59' 52" W
A2 — 33° 36' 52" N; 117° 58' 49" W	C2 — 33° 37' 17" N; 117° 59' 51" W
A3 — 33° 36' 50" N; 117° 58' 48" W	C3 — 33° 37' 15" N; 117° 59' 50" W
A4 — 33° 36' 49" N; 117° 58' 47" W	D1 — 33° 37' 29" N; 118° 00' 05" W
B1 — 33° 37' 10" N; 117° 59' 18" W	D2 — 33° 37' 28" N; 118° 00' 04" W
B2 — 33° 37' 09" N; 117° 59' 17" W	D3 — 33° 37' 26" N; 118° 00' 03" W
B3 — 33° 37' 07" N; 117° 59' 16" W	D4 — 33° 37' 24" N; 118° 00' 02" W


HUNTINGTON BEACH ARTIFICIAL REEFS
N
N
(magnetic)
REEF 1
A1
A2
A3
A4
117 58'51''
33 36'54''
117 58'46''
33 36'49''
62
Relief - 2 feet
REEF 2
C1
C2
C3
117 59'53''
33 37'19''
117 59'49''
33 37'15''
64
Relief
2 feet
0
50
100 FEET

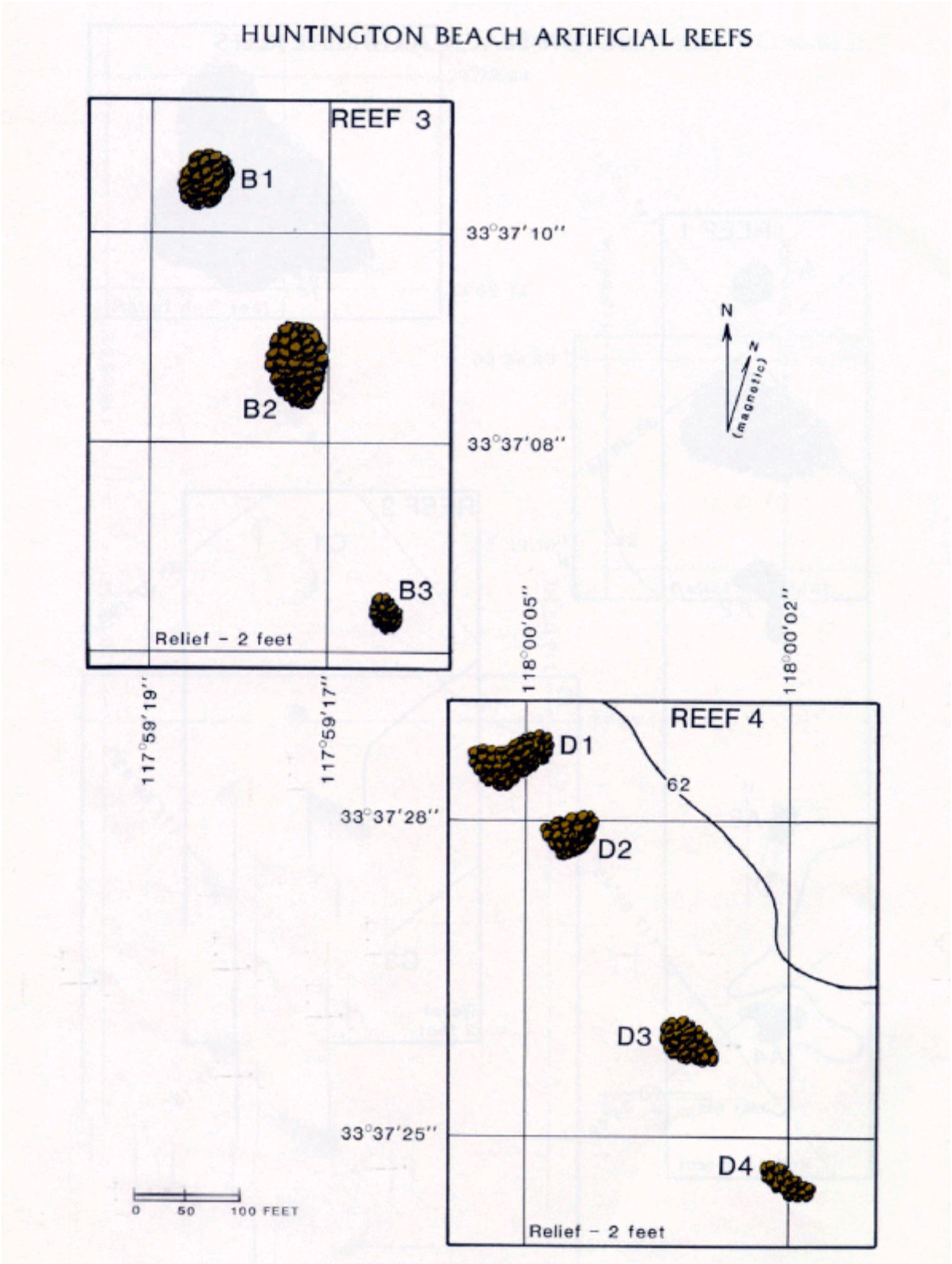

HUNTINGTON BEACH ARTIFICIAL REEFS
REEF 3
B1
B2
B3
33°37'10"
33°37'08"
Relief – 2 feet
N
N (magnetic)
117°59'19"
117°59'17"
118°00'05"
118°00'02"
REEF 4
D1
D2
D3
D4
62
33°37'28"
33°37'25"
0 50 100 FEET
Relief – 2 feet

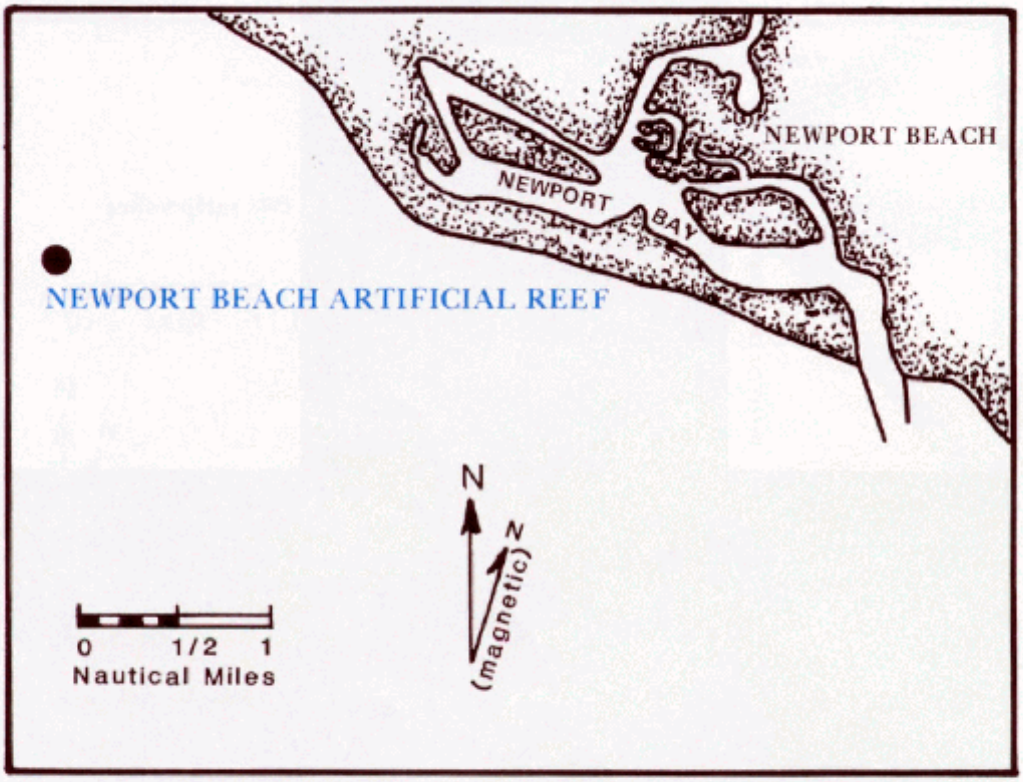
PHOTO: DFG Staff

Pile surfperches

Rock wrasse occur year-round.

PHOTO: Charles H. Turner

NEWPORT BEACH ARTIFICIAL REEF



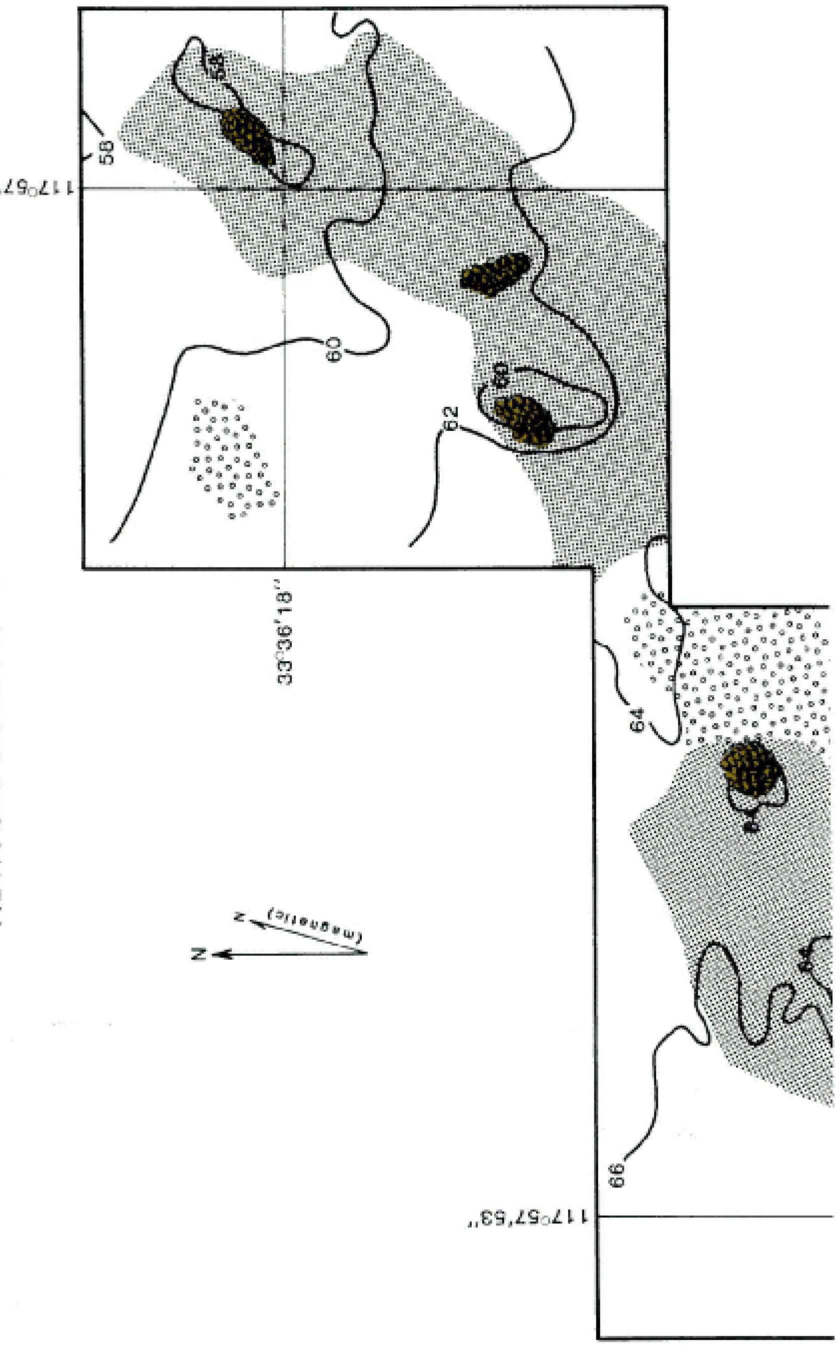
Center Coordinates	36° 16' 13" N x 117° 57' 49" W **Depth** 72 ft. (MLLW)
Compass Bearing	267° (mag), 4.5 N miles from end of Newport Jetty
Year Constructed	1979, Augmented 1981, 82 & 84. **Area** 8 acres (approx.)
Materials Used	10,675 tons concrete blocks, pilings and rubble
Comments	This reef can often be located by fathometer tracing of large numbers of blacksmith over the piles. Sizable barred sandbass numbers have been observed by divers.

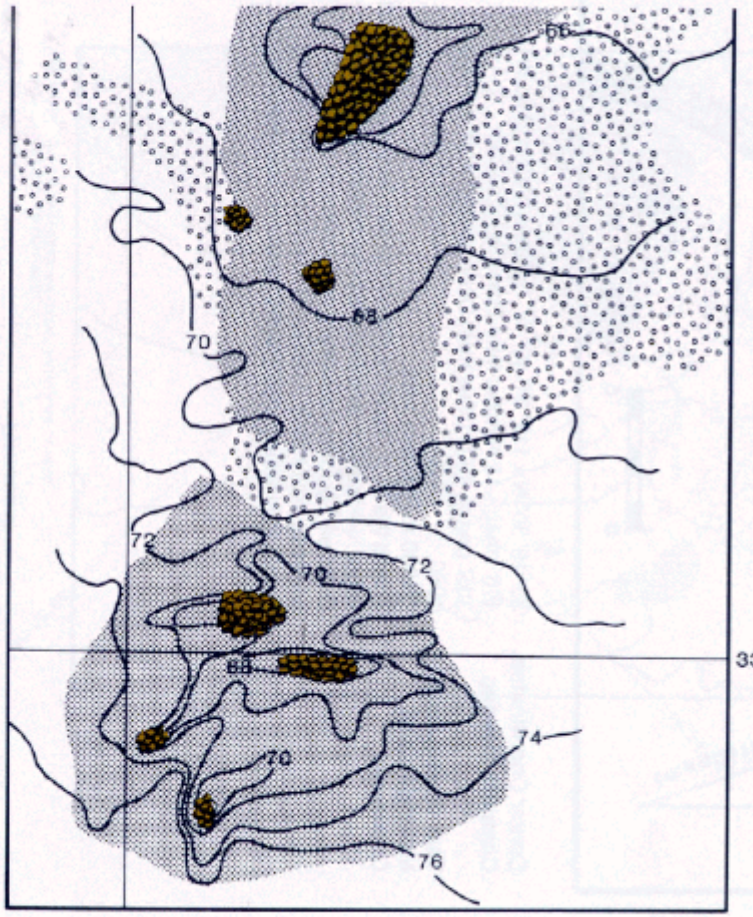
Notes

Even young anglers find a challenge

PHOTO : David O. Parker

NEWPORT BEACH ARTIFICIAL REEF





Coordinates:

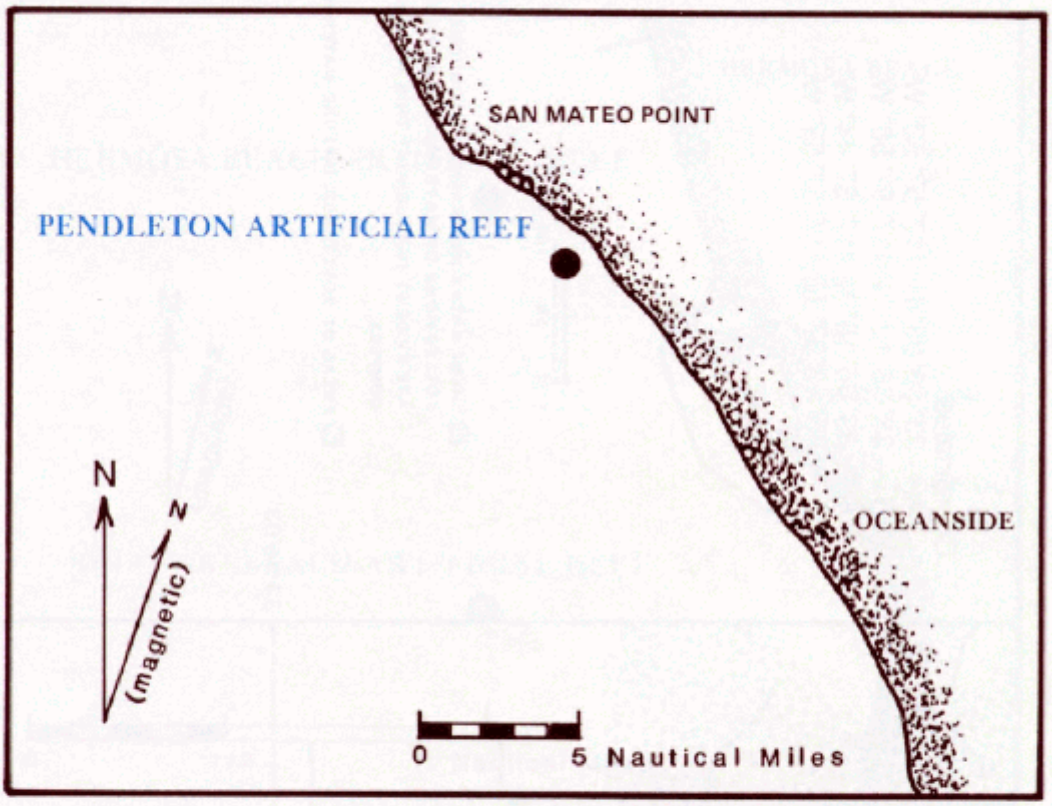
A — 33° 36' 08" N; 117° 57' 52" W
B — 33° 36' 13" N; 117° 57' 50" W
C — 33° 36' 16" N; 117° 57' 44" W
E — 33° 36' 07" N; 117° 57' 53" W

0 50 100 FEET

THESE AREAS REPRESENT CONTIGUOUS COLLECTIONS OF MATERIAL. CONCRETE PILINGS ARE EVIDENT THROUGHOUT THIS ARTIFICIAL REEF COMPLEX.

AREAS OF SCATTERED, DIFFUSE MATERIALS.

PENDLETON ARTIFICIAL REEF

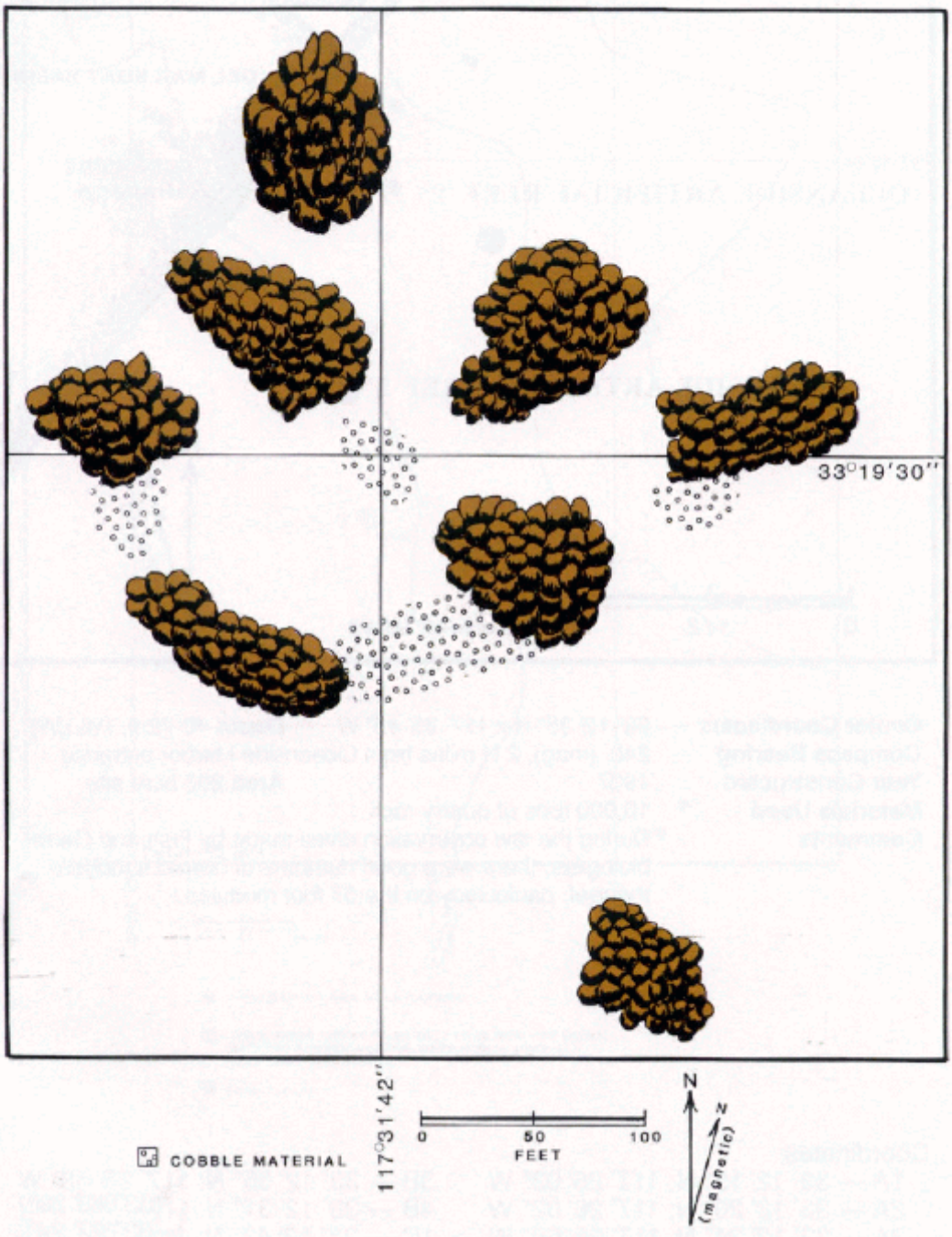


Center Coordinates 33° 19' 30" N x 117° 31' 42" W **Depth** 43 ft. (MLLW)
Compass Bearing 118° (mag), 12 N miles from Dana Point Harbor.
305° (mag), 10 N miles from Oceanside Harbor entrance.
Year Constructed 1980 **Area** 3.5 acres
Materials Used 10,000 tons quarry rock
Comments This is the pilot experimental reef of the developmental reef series. Very good sand bass fishing in September and October. Sculpins seasonally and various surfperches common year round. Lobster diving can be exceptional. Good underwater photographic area on clear water days.

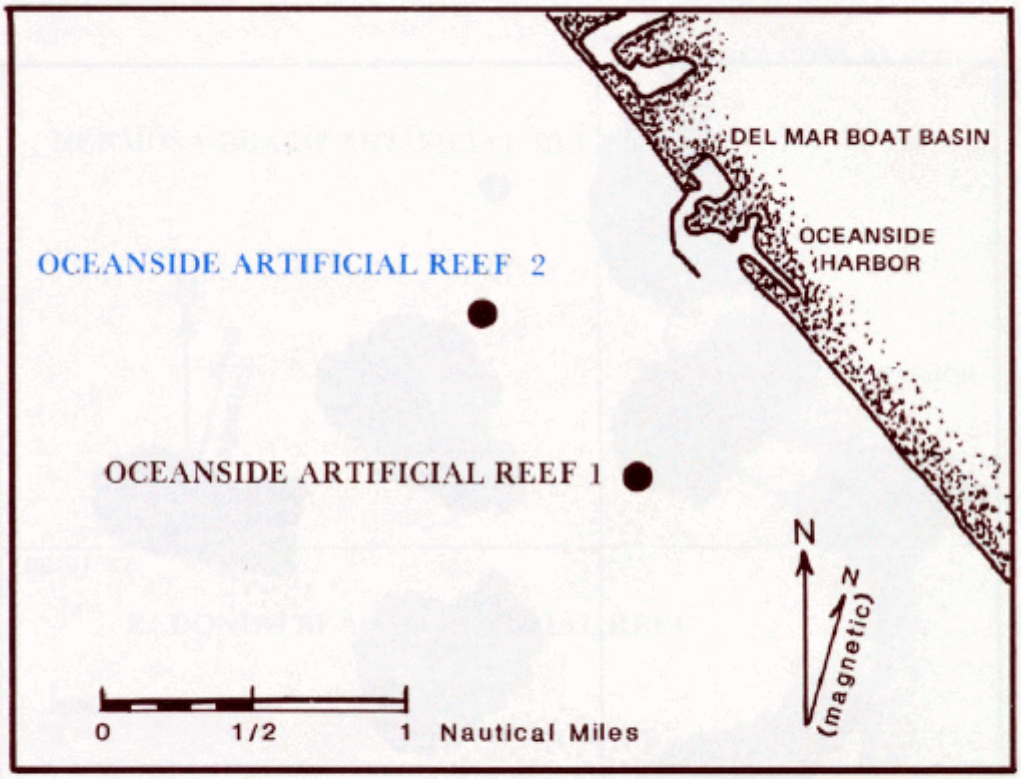
Schools of black croaker on Pendleton Artificial Reef.

Releasing a tagged sheephead at Pendleton Artificial Reef.

PENDLETON ARTIFICIAL REEF



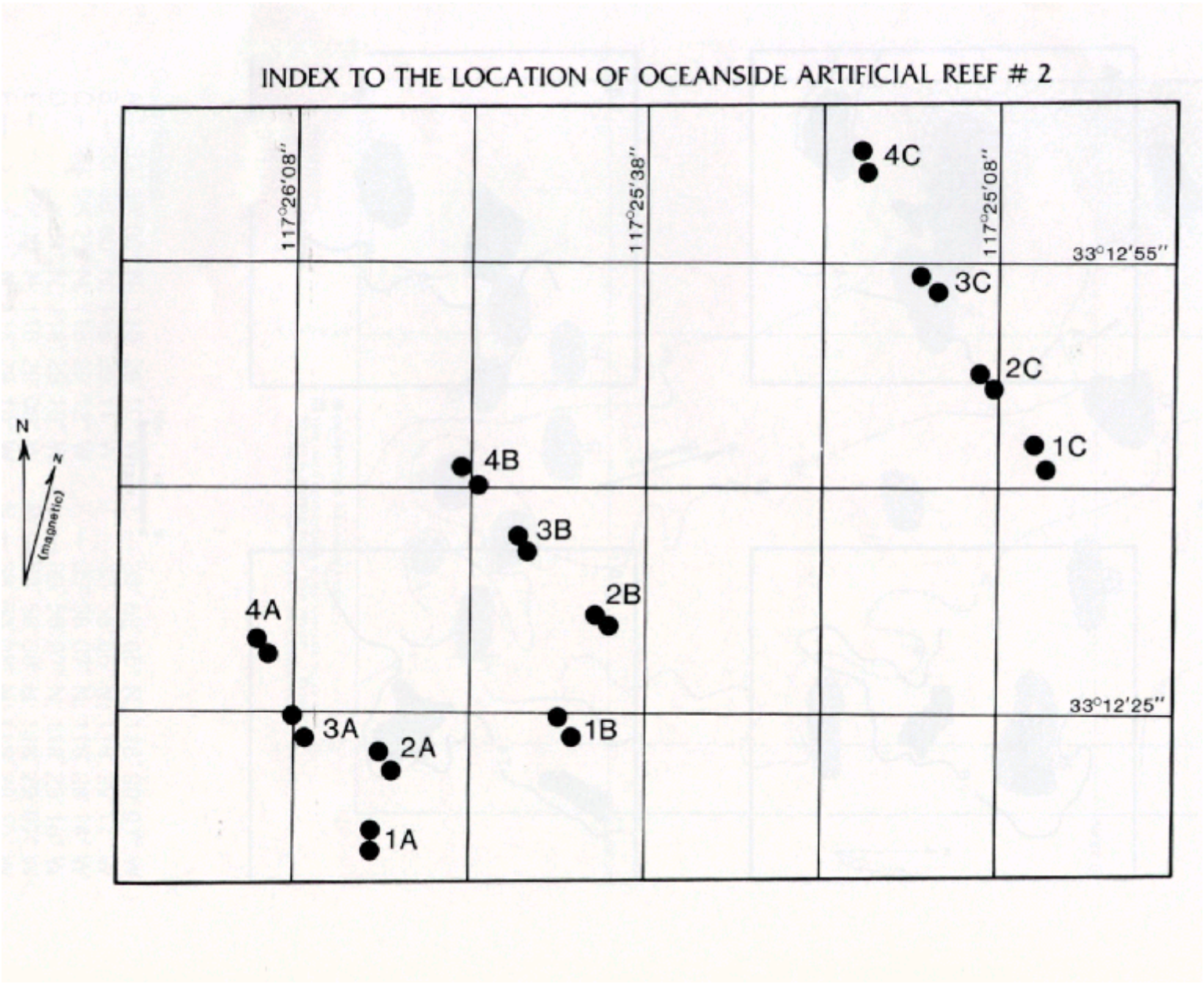
OCEANSIDE ARTIFICIAL REEF 2

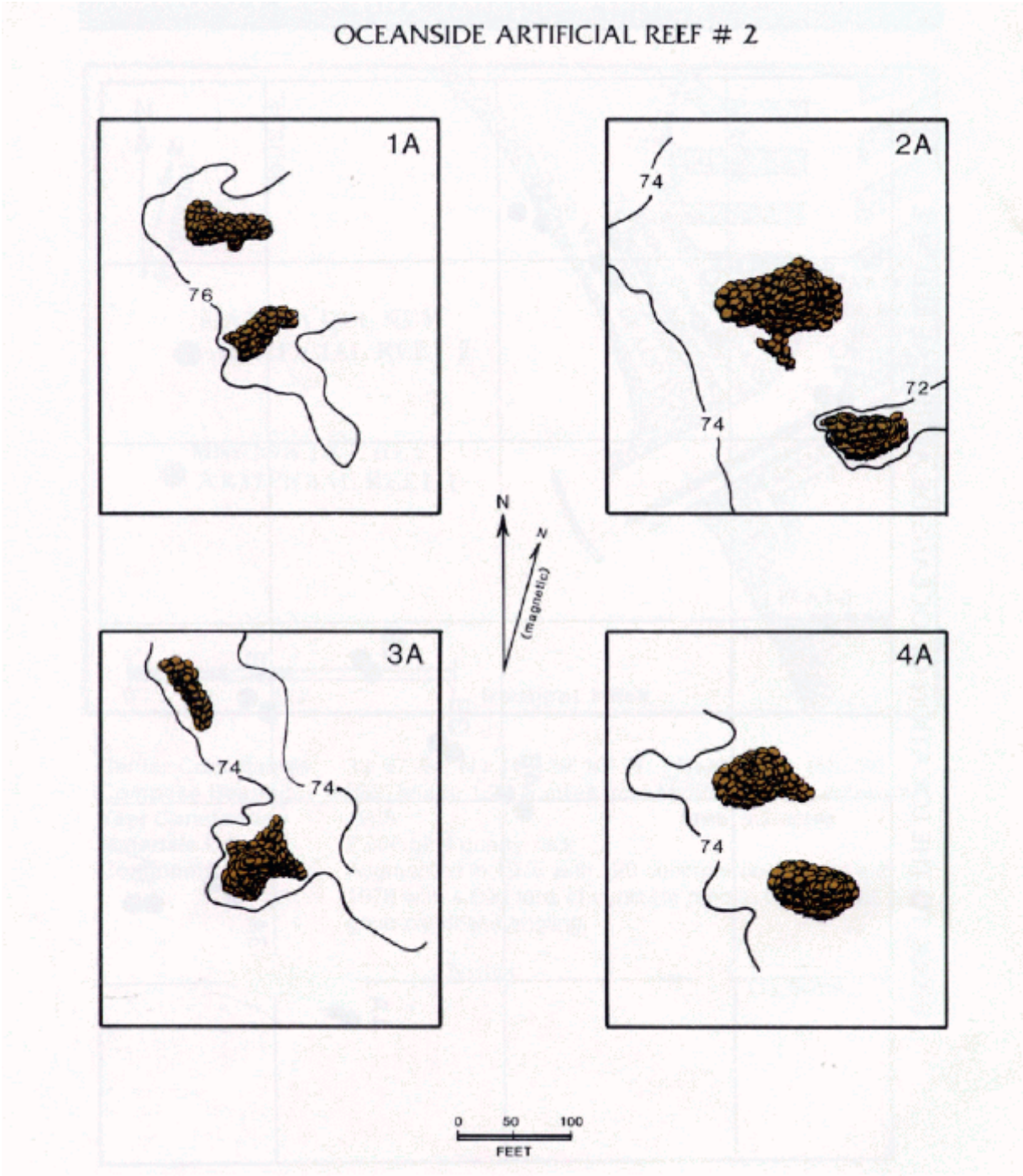


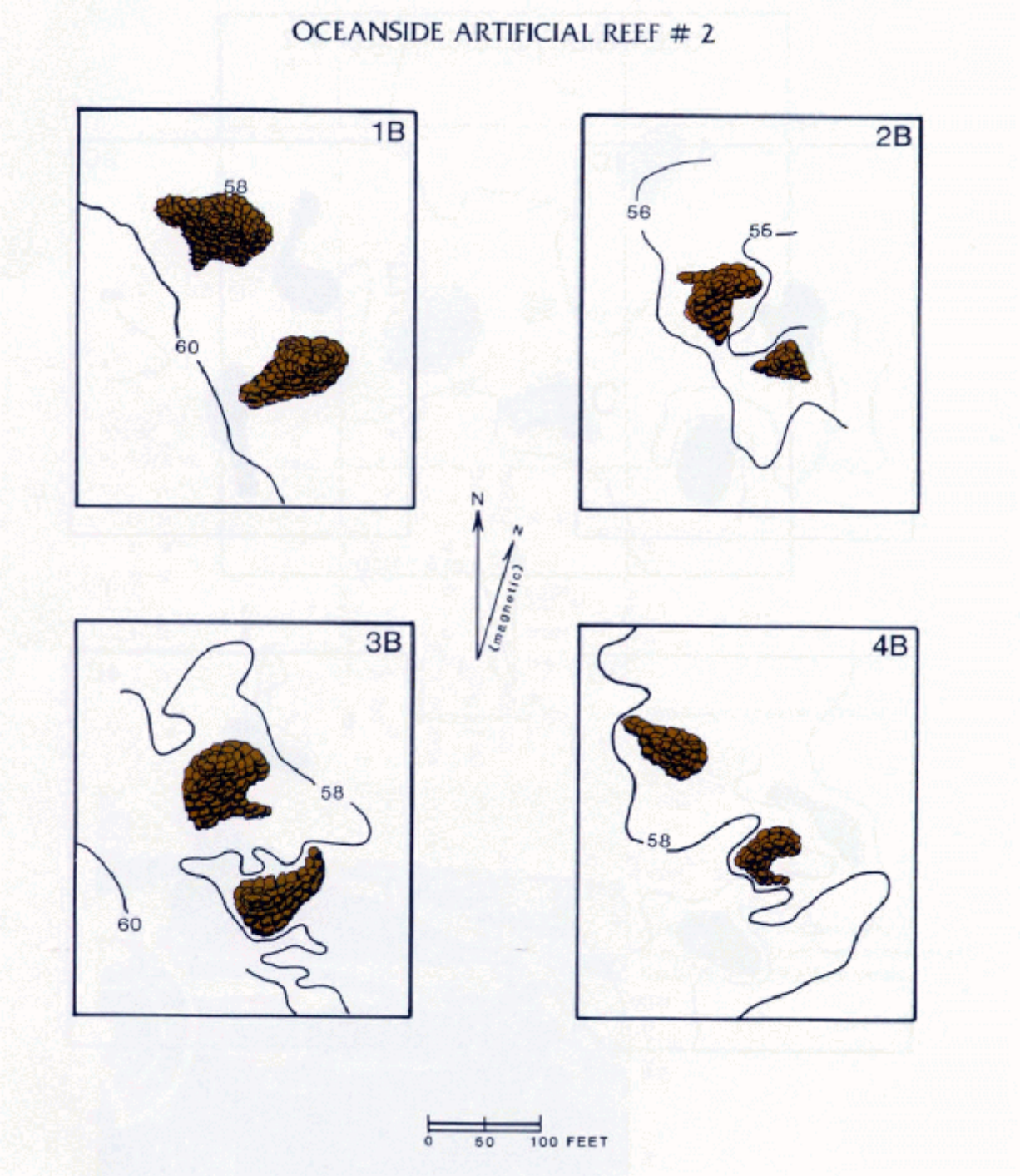
Center Coordinates	33° 12' 35" N x 117° 25' 48" W **Depth** 42-72 ft. (MLLW)
Compass Bearing	248° (mag), 2 N miles from Oceanside Harbor entrance
Year Constructed	1987 **Area** 256 acre site
Materials Used	10,000 tons of quarry rock
Comments	During the few observation dives made by Fish and Game biologists, there were good numbers of barred sandbass on the reef, particularly on the 57 foot modules.

Coordinates:

1A —	33° 12' 15.2" N; 117° 26' 05.3" W	3B —	33° 12' 37.3" N; 117° 25' 52.8" W
2A —	33° 12' 20.8" N; 117° 26' 04.1" W	4B —	33° 12' 44.3" N; 117° 25' 56.6" W
3A —	33° 12' 24.5" N; 117° 26' 10.6" W	1C —	33° 12' 43.2" N; 117° 25' 09.8" W
4A —	33° 12' 31.6" N; 117° 26' 14.5" W	2C —	33° 12' 47.8" N; 117° 25' 13.6" W
1B —	33° 12' 24.5" N; 117° 25' 39.5" W	3C —	33° 12' 54.6" N; 117° 25' 18.4" W
2B —	33° 12' 31.4" N; 117° 25' 46.3" W	4C —	33° 13' 03.0" N; 117° 25' 24.1" W


INDEX TO THE LOCATION OF OCEANSIDE ARTIFICIAL REEF # 2
117°26'08"
117°25'38"
117°25'08"
33°12'55"
33°12'25"
N
N
(magnetic)
4C
3C
2C
1C
4B
3B
2B
1B
4A
3A
2A
1A


OCEANSIDE ARTIFICIAL REEF # 2
1A
76
2A
74
72
74
N
N
(magnetic)
3A
74
74
4A
74
0
50
100
FEET


OCEANSIDE ARTIFICIAL REEF # 2
1B
58
60
2B
56
55
N
N
(magnetic)
3B
58
60
4B
58
0
50
100 FEET

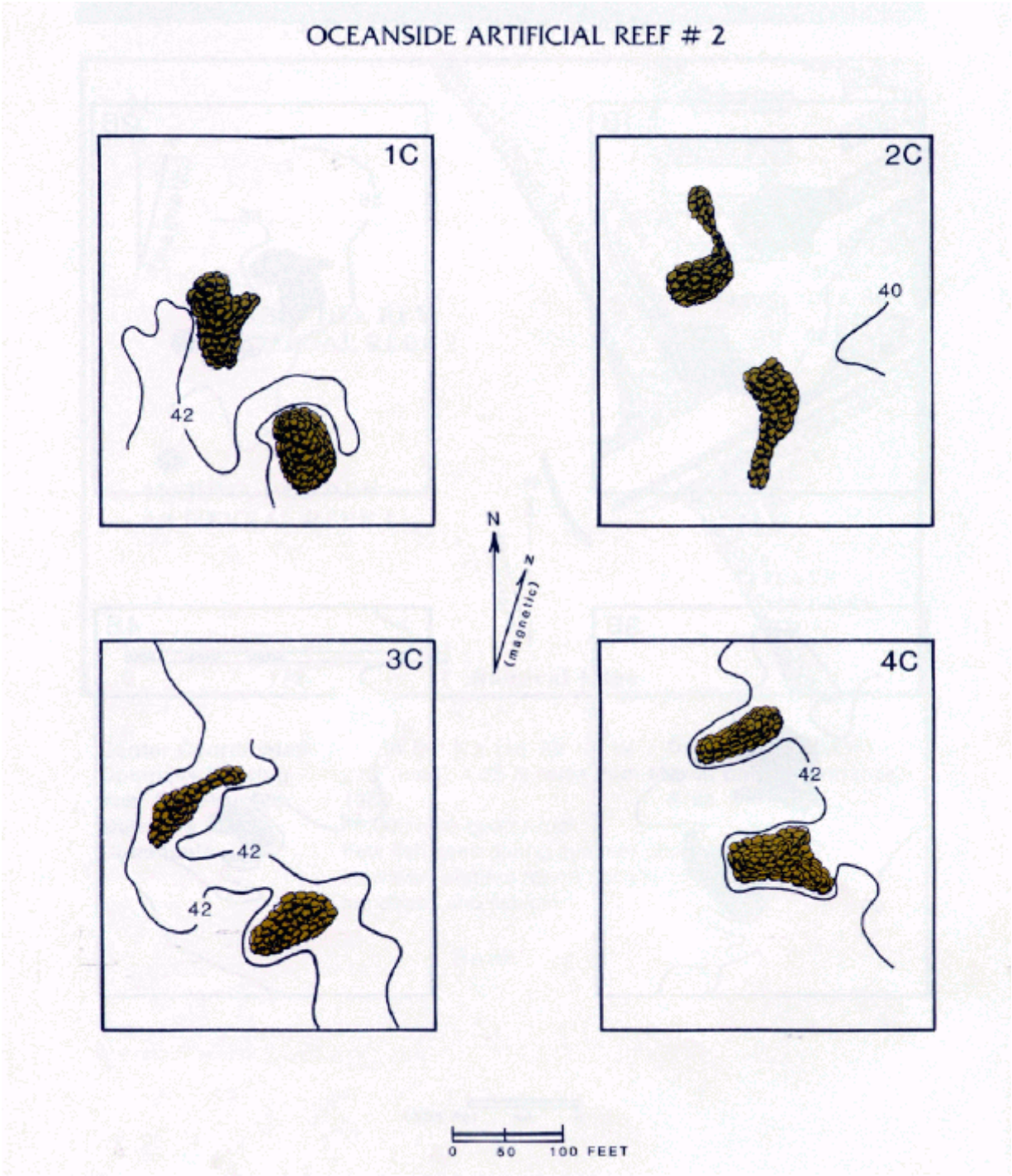

OCEANSIDE ARTIFICIAL REEF # 2
1C
42
2C
40
N
N
(magnetic)
3C
42
42
4C
42
0
50
100 FEET

PHOTO: Kenneth C. Wilson

Pendleton Artificial Reef construction.

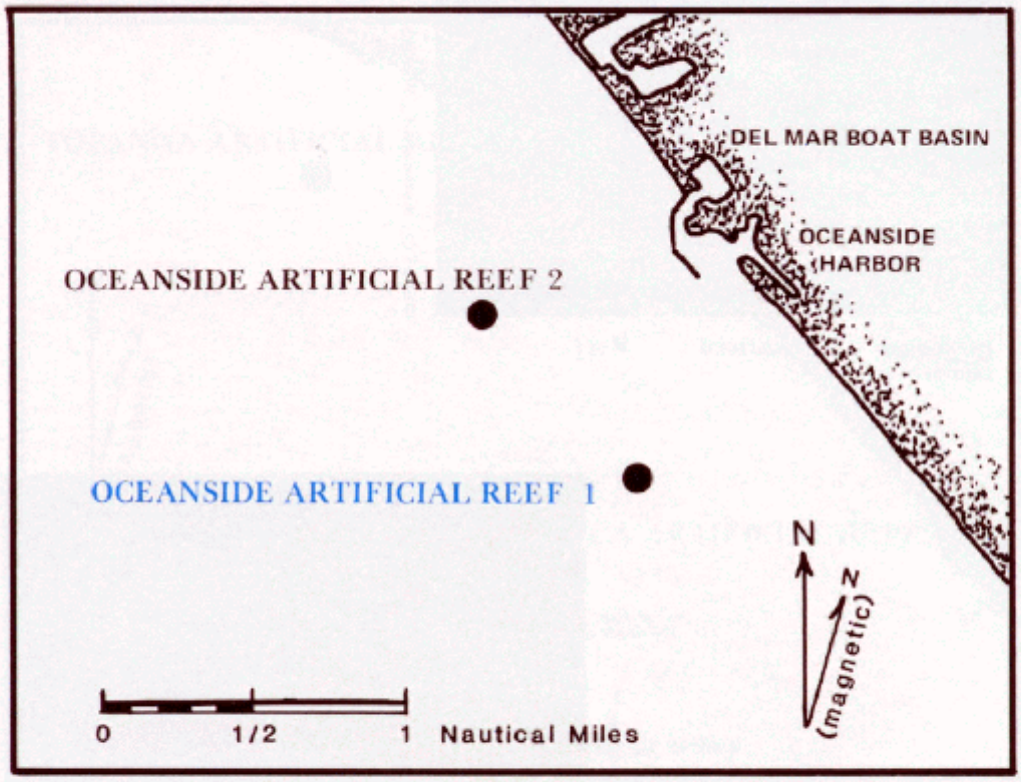
PHOTO: DFG Staff

Barred sandbass are numerous in the fall.

Kelpbass are a common species on artificial reefs and are popular with anglers.

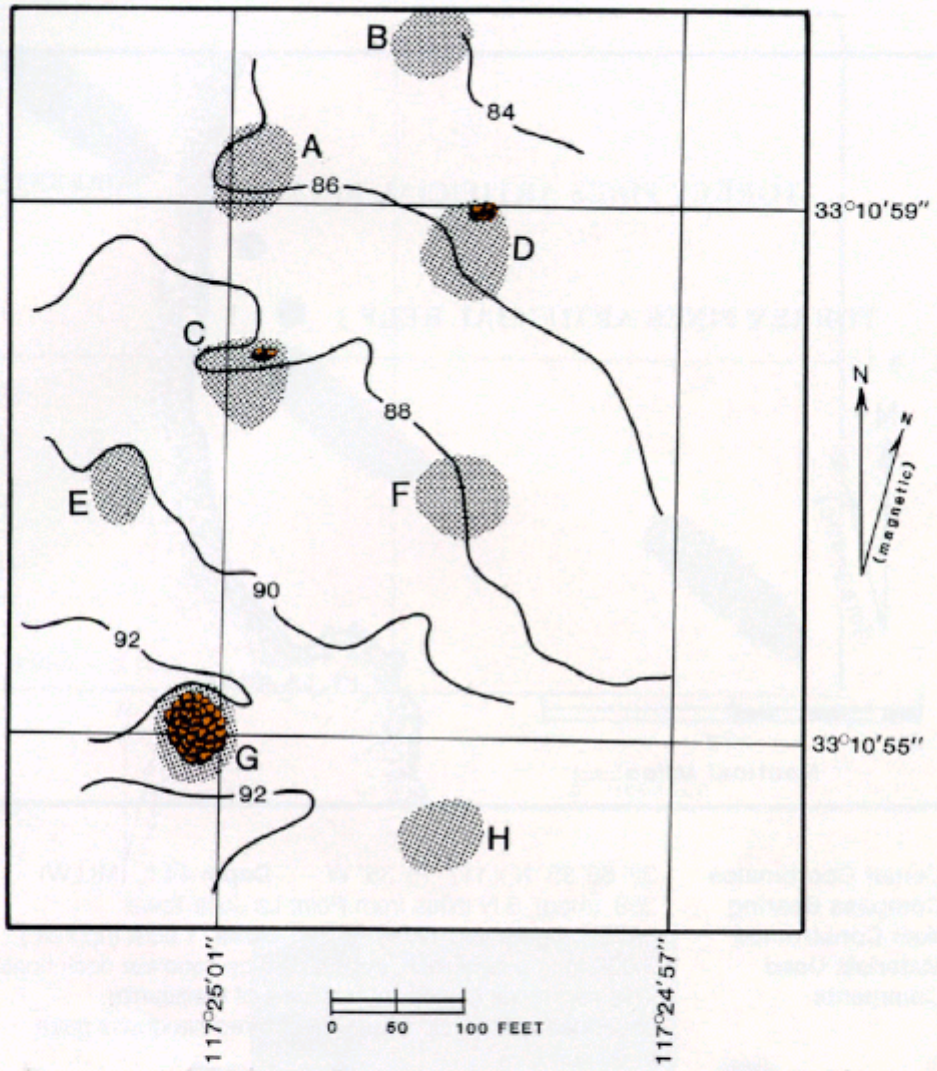
PHOTO: DFG Staff.

OCEANSIDE ARTIFICIAL REEF 1



Center Coordinates	33° 10' 57" N x 117° 25' 00" W **Depth** 82-100 ft. (MLLW)
Compass Bearing	202° (mag), 1.75 N miles from Oceanside Harbor entrance
Year Constructed	1964 (1987 augmentation) **Area** 4 acres
Materials Used	2,000 tons quarry rock
Comments	Augmented in 1987 with numerous concrete dock floats scattered over 64 acres of reef site. Sportfishing has occasionally been reported good for barred sandbass, kelp bass, and sheephead.

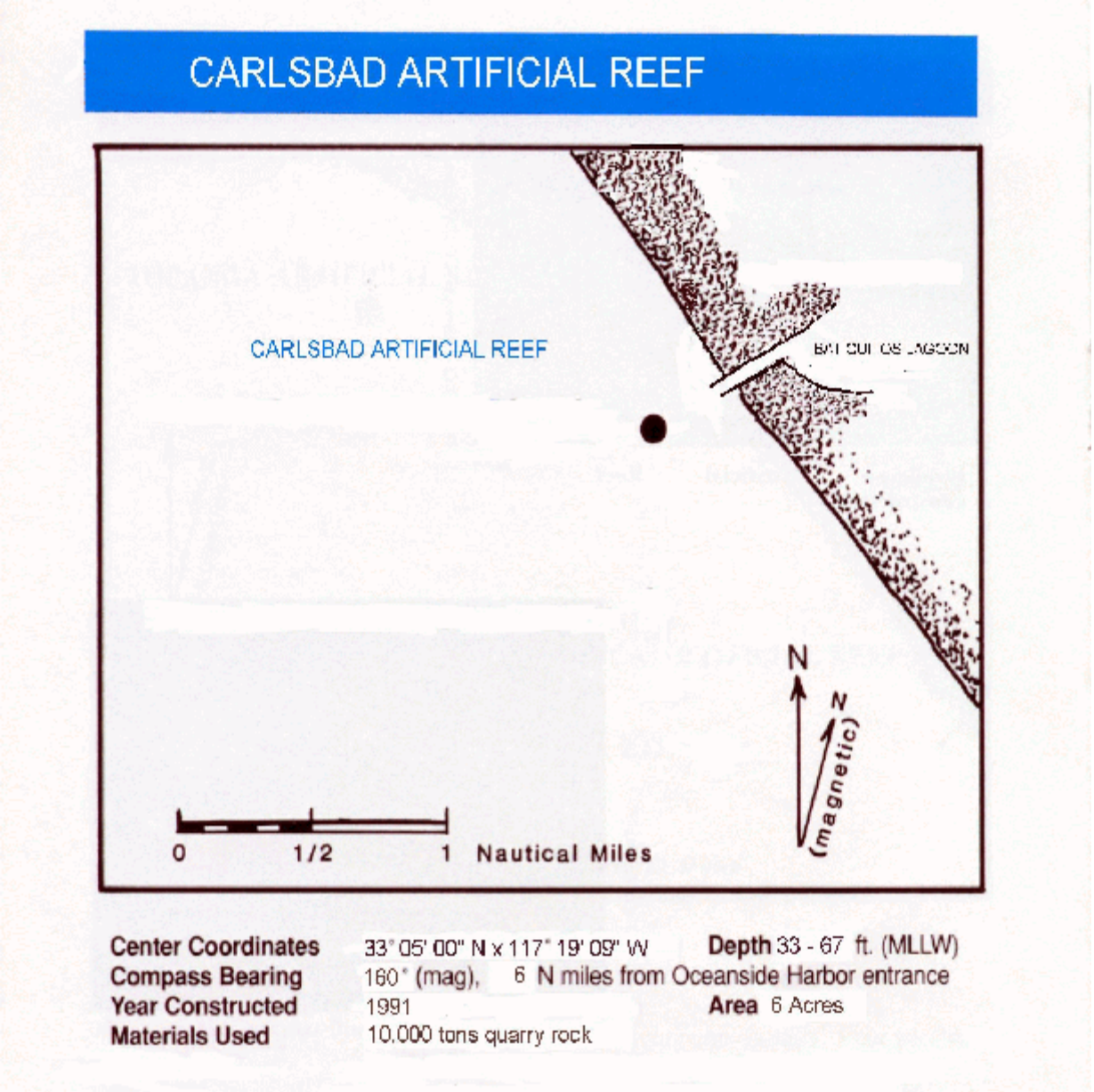
OCEANSIDE ARTIFICIAL REEF #1



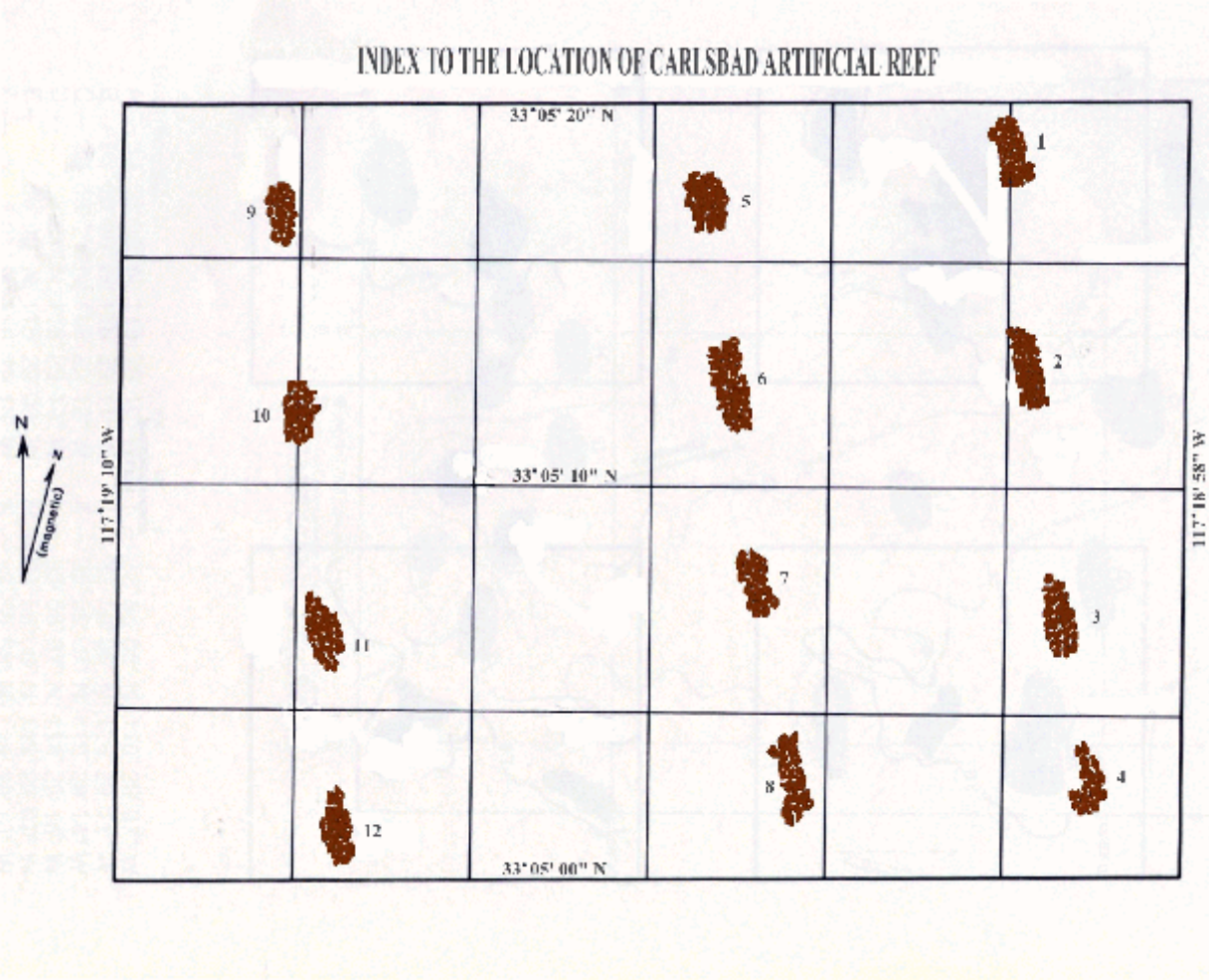
THESE AREAS REPRESENT DISTINCT PILES OF MATERIAL OF MOSTLY LOW RELIEF, & PILES WERE OBSERVED.

Coordinates:

A — 33° 10' 59" N; 117° 25' 01" W
B — 33° 11' 00" N; 117° 24' 59" W
C — 33° 10' 58" N; 117° 25' 01" W
D — 33° 10' 59" N; 117° 24' 59" W
E — 33° 10' 57" N; 117° 25' 02" W
F — 33° 10' 57" N; 117° 24' 59" W
G — 33° 10' 55" N; 117° 25' 01" W
H — 33° 10' 54" N; 117° 24' 59" W



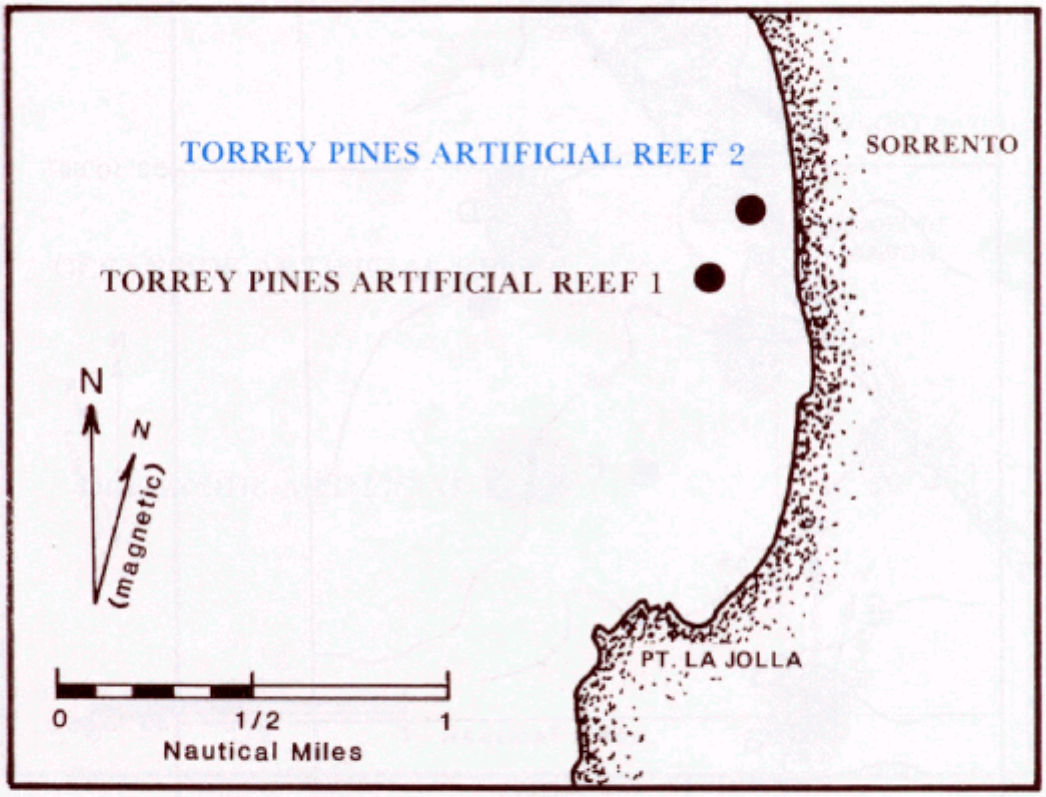
Carlsbad reef was built in anticipation of the opening of the mouth of Batiquitos Lagoon. Coastal estuaries are nursery grounds for some popular sport fish species, such as California halibut and sand bass. Carlsbad reef was designed to be an augmentation to this natural nursery system.



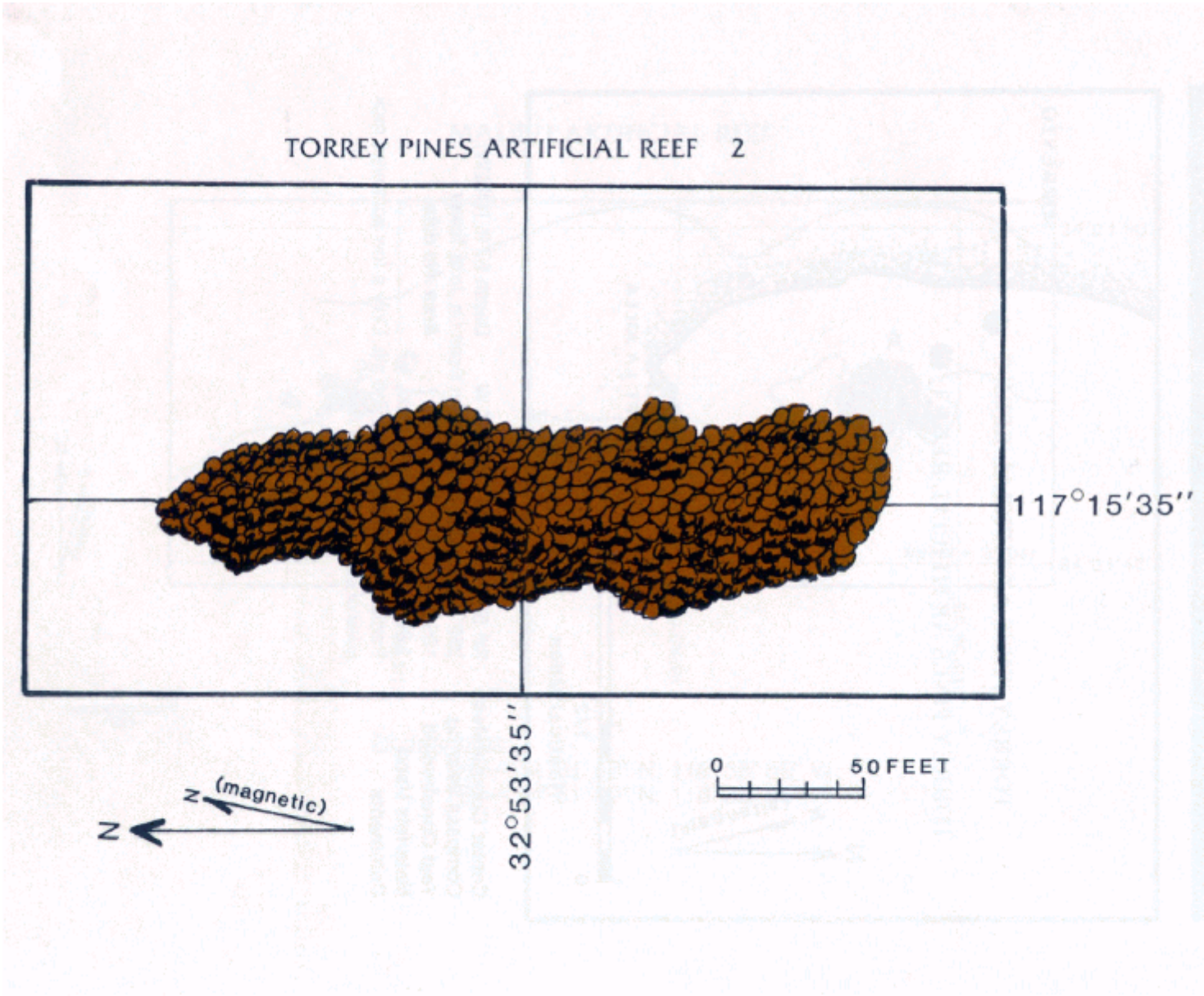
Reef Coordinates

1	33° 05' 19.5" N	117° 19' 13.1" W
2	33° 05' 14.1" N	117° 19' 11.0" W
3	33° 05' 09.8" N	117° 19' 09.2" W
4	33° 05' 03.5" N	117° 19' 07.3" W
5	33° 05' 16.8" N	117° 19' 14.4" W
6	33° 05' 11.4" N	117° 19' 13.2" W
7	33° 05' 05.4" N	117° 19' 11.4" W
8	33° 05' 00.0" N	117° 19' 09.0" W
9	33° 05' 15.6" N	117° 19' 25.2" W
10	33° 05' 10.8" N	117° 19' 22.8" W
11	33° 05' 04.8" N	117° 19' 20.4" W
12	33° 05' 58.2" N	117° 19' 19.2" W

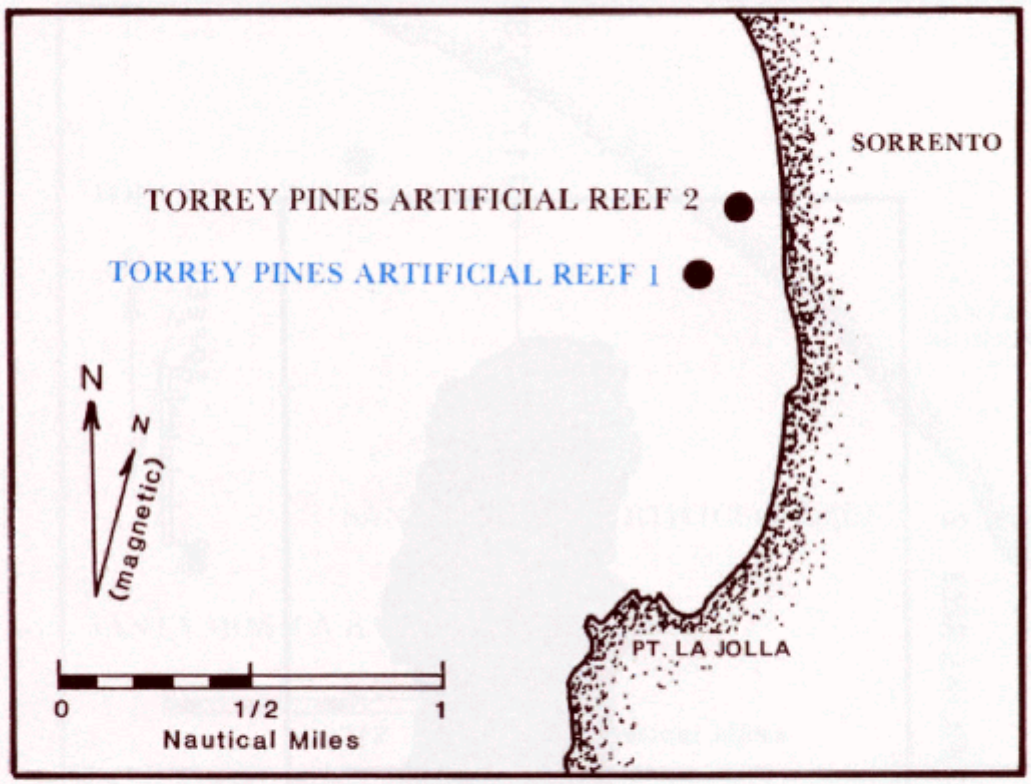
TORREY PINES ARTIFICIAL REEF 2



Center Coordinates 32° 53' 35" N x 117° 15' 35" W **Depth** 44 ft. (MLLW)
Compass Bearing 359° (mag), 3 N miles from Point La Jolla Tower
Year Constructed 1975, (augmented 1979) **Area** 1 acre (approx.)
Materials Used 3,000 tons quarry rock, augmented by concrete dock floats.
Comments This reef holds significant numbers of blacksmith, sheephead, and kelp bass. Few barred sandbass have been seen.

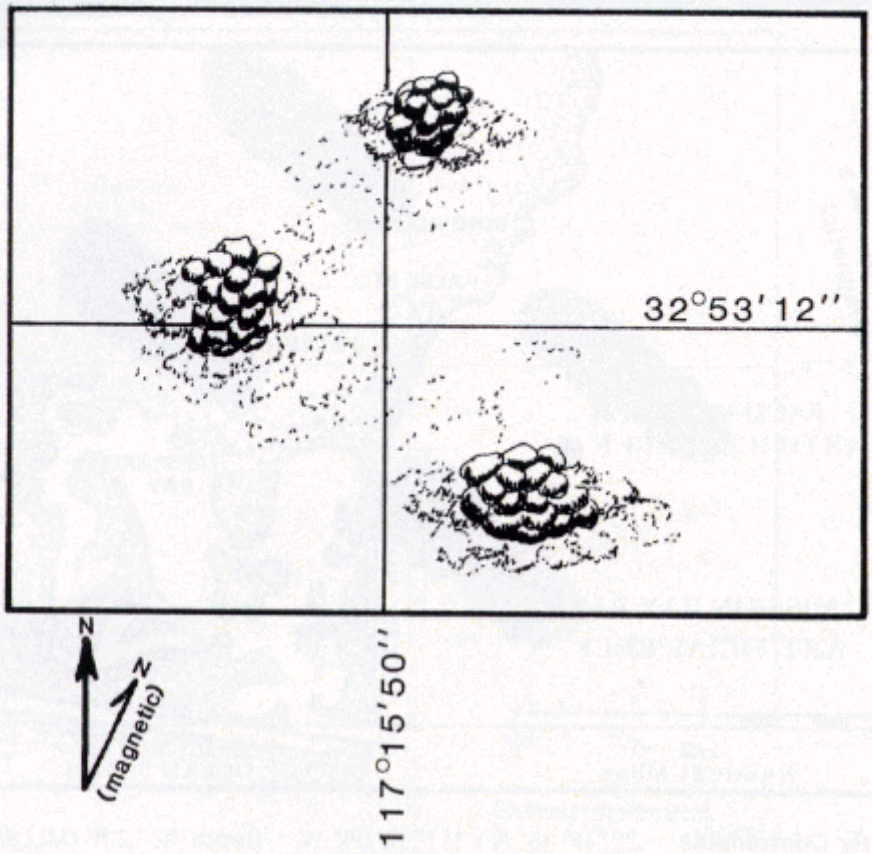

TORREY PINES ARTIFICIAL REEF 2
117°15'35"
32°53'35"
0
50 FEET
N (magnetic)
N

TORREY PINES ARTIFICIAL REEF 1



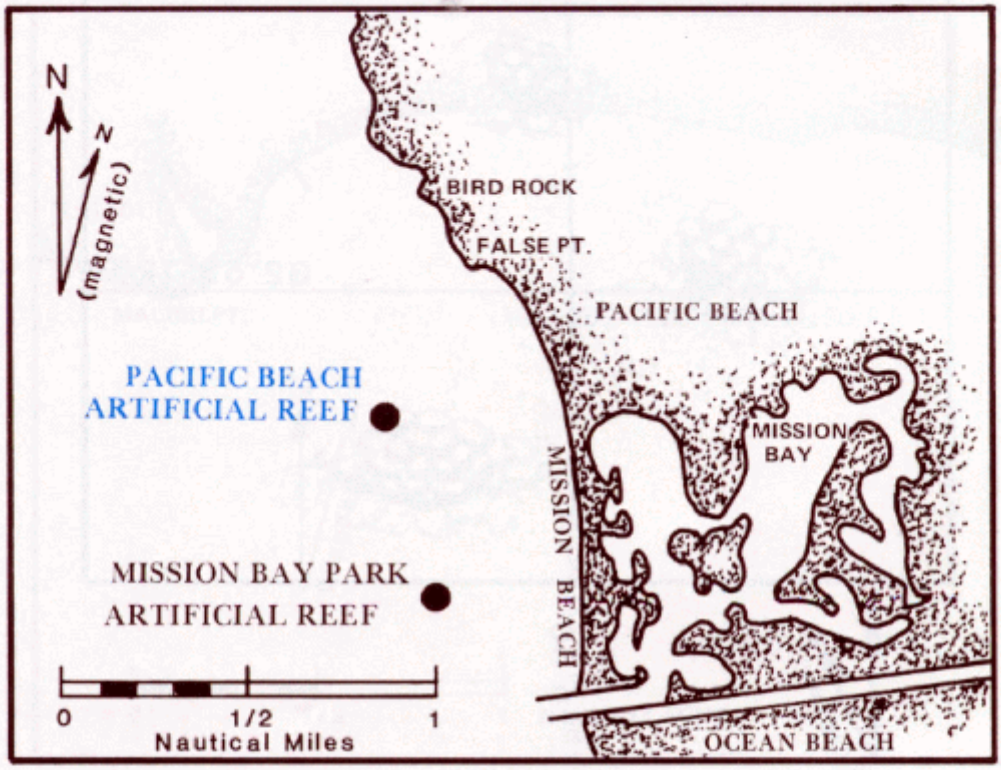
Center Coordinates	32° 53' 12" N x 117° 15' 50" W **Depth** 67 ft. (MLLW)
Compass Bearing	352° (mag), 2.5 N miles from Point La Jolla Tower
Year Constructed	1964 **Area** No data
Materials Used	1,000 tons large quarry rock
Comments	Partially covered by sand and slit. Only a few scattered rock piles observed. Very low relief.

TORREY PINES ARTIFICIAL REEF #1



DFG biologist, Ken Wilson examining artificial reef.

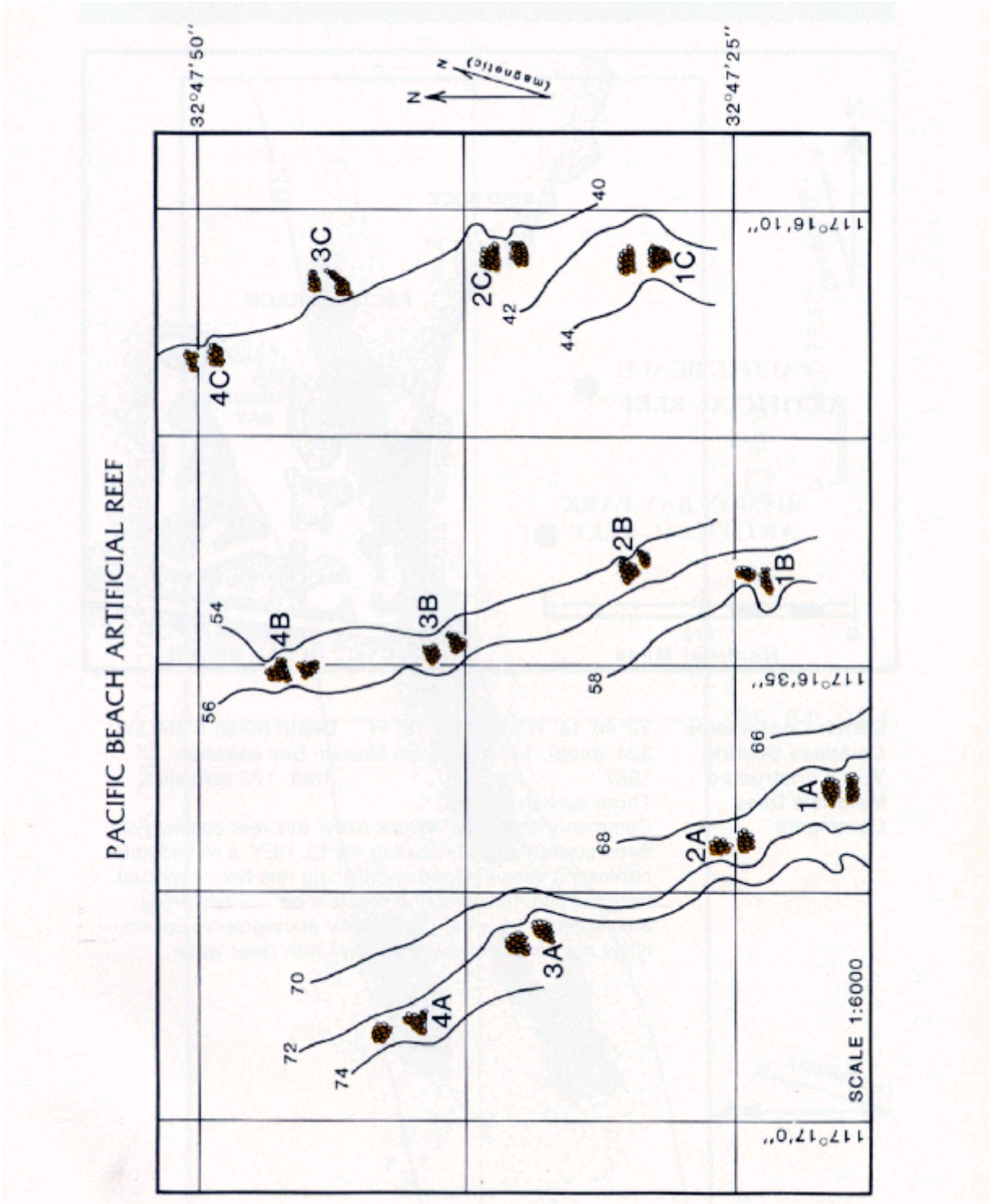
PACIFIC BEACH ARTIFICIAL REEF



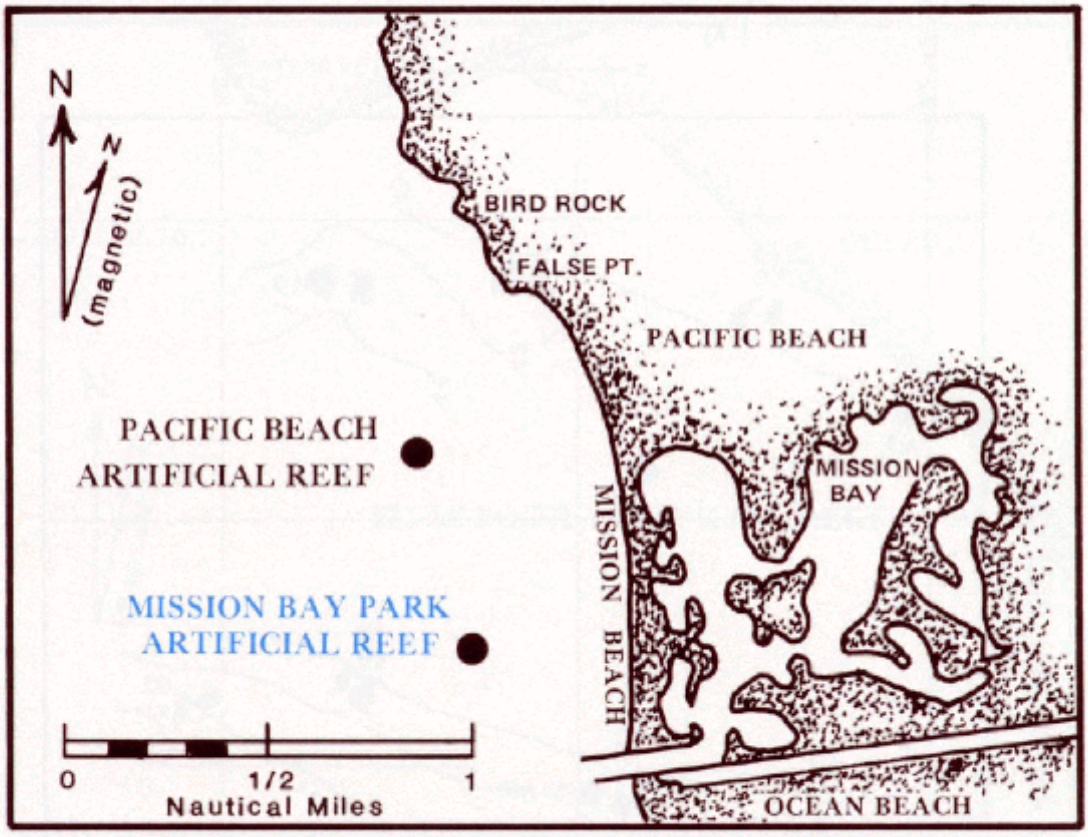
Center Coordinates 32° 47' 35" N x 117° 16' 35" W **Depth** 42-72 ft. (MLLW)
Compass Bearing 324° (mag), 2.5 N miles from Mission Bay entrance
Year Constructed 1987 **Area** 109 acre site
Materials Used 10,000 tons quarry rock
Comments Reef supports a wide variety of kelp-rock habitat organisms. Excellent lobster diving has been reported. Also, good numbers of kelp and sandbass have been seen by Fish and Game biologists on every observation dive.

Coordinates:

1A — 32° 47' 20" N; 117° 16' 42" W
2A — 32° 47' 25" N; 117° 16' 45" W
3A — 32° 47' 35" N; 117° 16' 50" W
4A — 32° 47' 40" N; 117° 16' 55" W
1B — 32° 47' 24" N; 117° 16' 30" W
2B — 32° 47' 30" N; 117° 16' 30" W
3B — 32° 47' 38" N; 117° 16' 34" W
4B — 32° 47' 56" N; 117° 16' 35" W
1C — 32° 47' 30" N; 117° 16' 12" W
2C — 32° 47' 36" N; 117° 16' 12" W
3C — 32° 47' 44" N; 117° 16' 14" W
4C — 32° 47' 50" N; 117° 16' 18" W


PACIFIC BEACH ARTIFICIAL REEF
32°47'50"
32°47'25"
N
N (magnetic)
117°16'10"
117°16'35"
117°17'0"
SCALE 1:6000
4C
3C
2C
1C
4B
3B
2B
1B
4A
3A
2A
1A
40
42
44
54
56
58
66
68
70
72
74

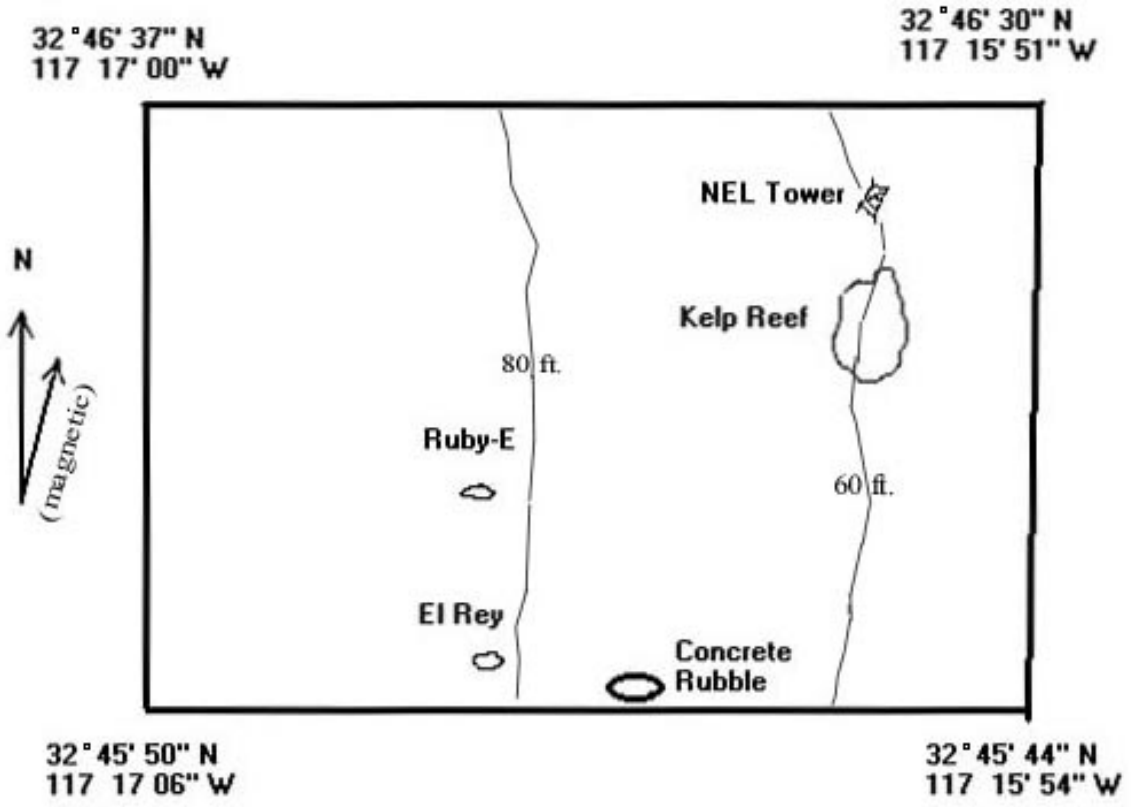
MISSION BAY PARK ARTIFICIAL REEF



Center Coordinates	32° 46' 14" N x 117° 16' 18" W	**Depth**	80-90 ft. (MLLW)
Compass Bearing	324° (mag), 1 N miles from Mission Bay entrance		
Year Constructed	1987	**Area**	173 acre site

Materials Used Three sunken vessels and concrete rubble.

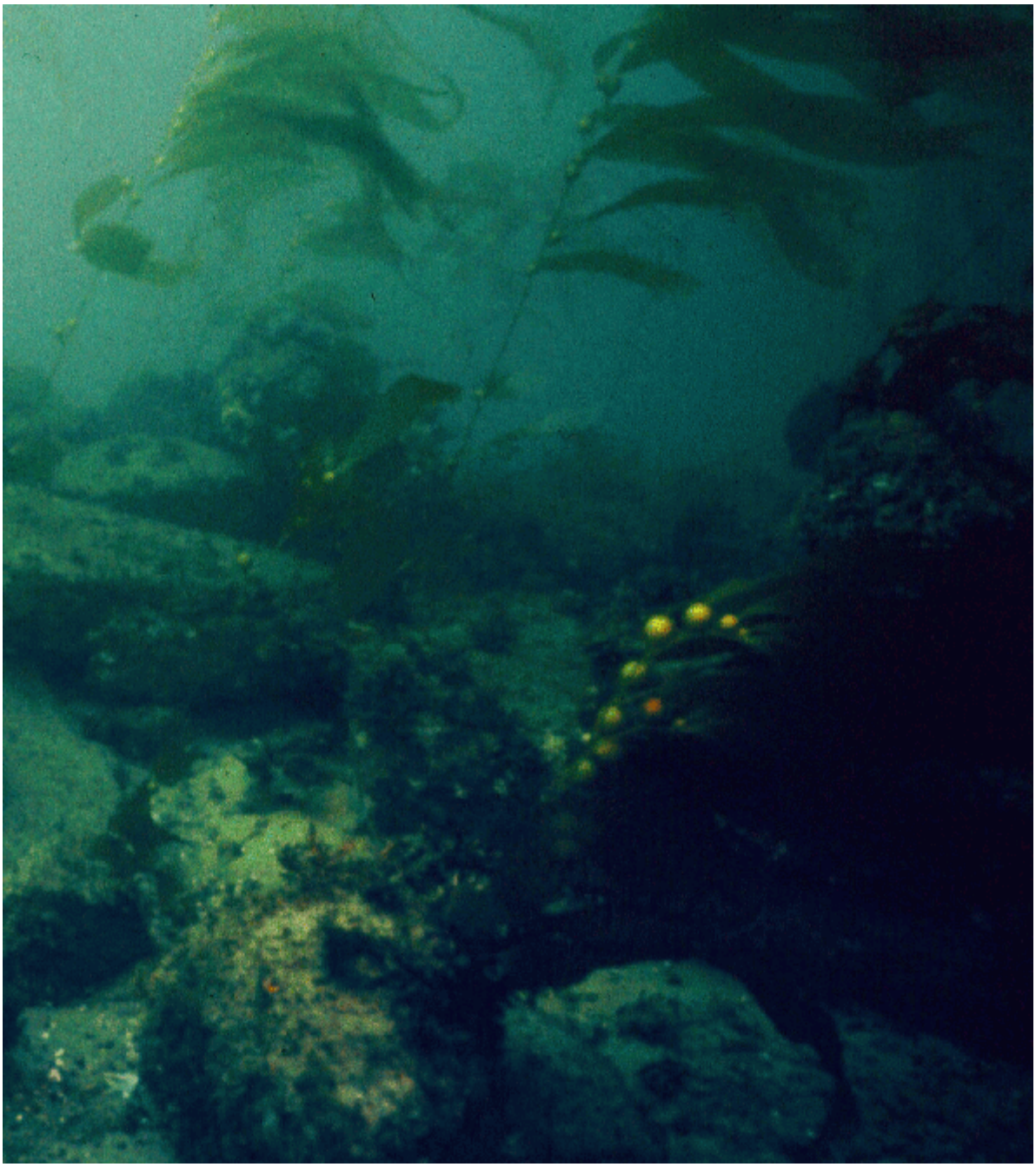
Comments The original reef consisted of three sunken vessels. Concrete rubble has been added periodically since. Most notable was the 1992 addition of 9000 tons of concrete roadway rubble. This was scattered over 11 acres at a 60 ft. depth. Shortly after the material was placed, it began growing kelp, and has remained a kelp bed since. It became the focus of much research, prior to the construction of the Southern California Edison mitigation kelp reef off San Clemente, since the Mission Beach Kelp Reef represents the first time kelp has been sustained for more than a couple of years on an artificial reef in the United States.



Coordinates:

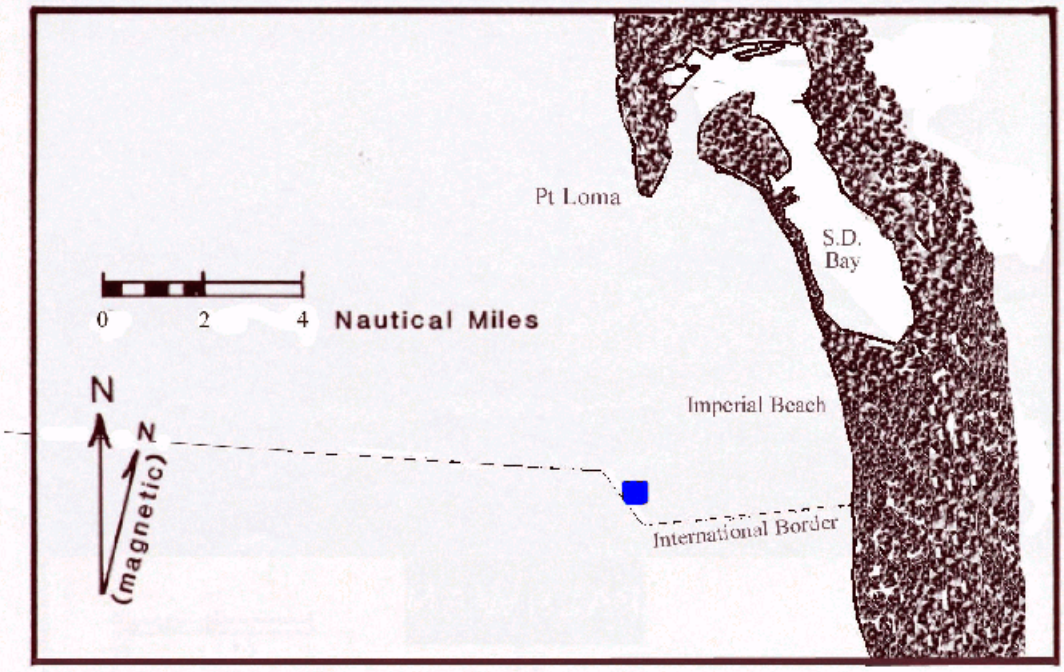
Kelp Reef	32° 46' 12" N	117° 16' 04" W
NEL Tower	32° 46' 22" N	117° 16' 03" W
Ruby-E	32° 46' 02" N	117° 16' 36" W
El Rey	32° 45' 51" N	117° 16' 38" W
Pier Pilings	32° 45' 51" N	117° 16' 31" W

Notes



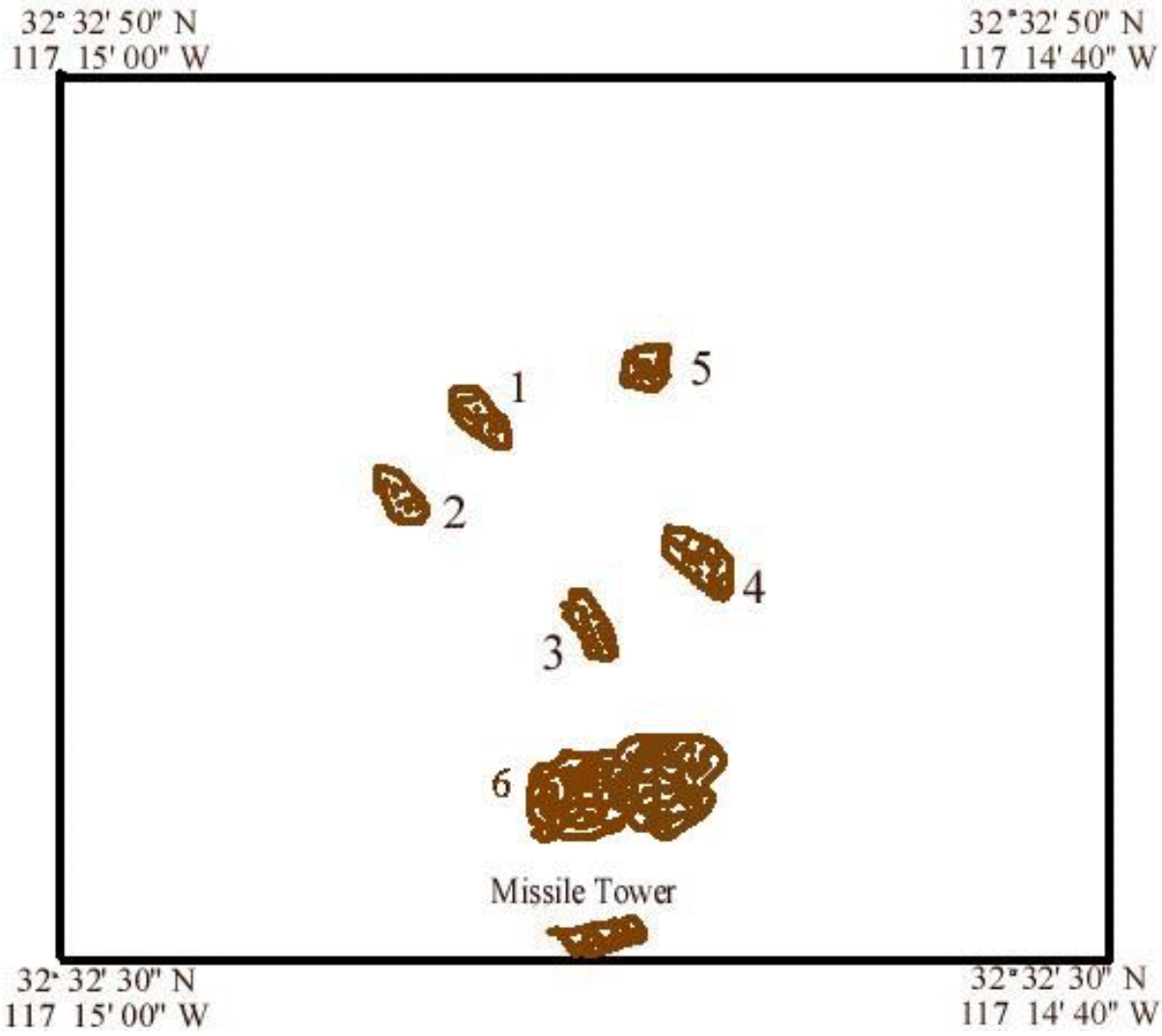
The Kelp Bed Reef at Mission Beach Artificial Reef in1995.

INTERNATIONAL ARTIFICIAL REEF



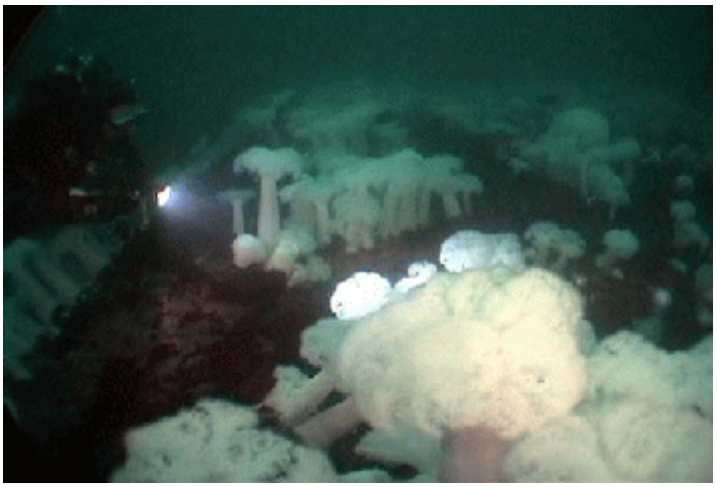
Compass Bearing 190° (mag) from Point Loma at 7.1 N miles.
Year Constructed 1992 - present **Area** 75 acres
Materials Used 25,000 tons quarry rock, concrete and steel missile tower, 300 tons concrete rubble.
Comments Still under construction, this reef is the deepest of the Fish and Game reefs (165 ft.) This is an excellent fishing reef for sand bass and surface fishes in the summer months and rock fish in the winter months. The reef is too deep for sport diving, however some local technical, mixed gas divers have photographed the Trident missile test tower.

Notes



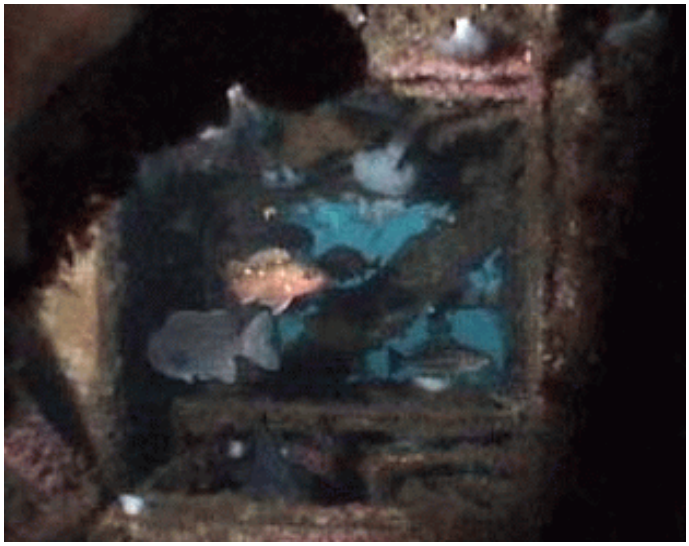
Coordinates:

1	32° 32' 40.3" N	117° 14' 53.1" W
2	32° 32' 39.7" N	117° 14' 54.0" W
3	32° 32' 37.5" N	117° 14' 50.0" W
4	32° 32' 38.8" N	117° 14' 48.2" W
5	32° 32' 43.0" N	117° 14' 50.5" W
6	32° 32' 34.0" N	117° 14' 47.0" W
Missile Tower	32° 32' 29.7" N	117° 14' 47.4" W



Technical divers on missile tower at International Artificial Reef

Photographs courtesy of Perry Armor of DiveGeeks, San Diego.



.

Rockfish, blacksmith and kelp bass inside the tower.

Artificial Reef Coordinates in Southern California

California Department of Fish & Game

File Updated 6/01

NAME	YEAR BUILT	DEPTH (feet)	MATERIAL	SIZE (tons or number)	Lat Deg N	Lat Min	Lat Sec	Long Deg W	Long Min	Long Sec
Atascadero	1985	55	quarry rock	3,500 tons	35	23	36	120	52	32
San Luis Obispo	1984-85	42-52	concrete tribar/rubble	27,000 tons	35	11	25	120	49	55
Pitas Point	1984	28	quarry rock	7,200 tons	34	18	8	119	22	6
Malibu A	1961	60	quarry rock	333 tons	34	1	48.65	118	39	1.91
Malibu B			concrete shelters	44 pieces	34	1	49	118	39	5
Malibu Center			car bodies	14 pieces (disintegrated)	34	1	49	118	39	2
Topanga	1987	28	quarry rock	10,000 tons	34	1	38	118	31	57
Santa Monica Bay 1	1987	42-72	quarry rock	20,000 tons	not found					
Santa Monica Bay 2					34	0	51	118	32	3
Santa Monica Bay 3					34	1	2.06	118	32	9.78
Santa Monica Bay 4					34	1	5.75	118	32	17.68
Santa Monica Bay 5					34	1	10.56	118	32	25.56
Santa Monica Bay 6					34	1	19.4	118	32	41
Santa Monica Bay 7					34	1	22.61	118	32	48.92
Santa Monica Bay 8					34	1	16	118	32	52
Santa Monica Bay 9					34	0	29	118	32	4
Santa Monica Bay 10					34	0	36.05	118	32	2.18
Santa Monica Bay 11					34	0	41.47	118	32	10.1
Santa Monica Bay 12					34	0	42.77	118	32	17.98
Santa Monica Bay 13					34	0	47.08	118	32	26.34
Santa Monica Bay 14					34	0	50.47	118	32	37.8
Santa Monica Bay 15					34	0	50	118	32	54
Santa Monica Bay 16					34	0	57	118	33	3
Santa Monica Bay 17					34	0	9	118	32	14
Santa Monica Bay 18					34	0	17.84	118	32	13.3
Santa Monica Bay 19					34	0	17	118	32	26
Santa Monica Bay 20					34	0	21	118	32	37
Santa Monica Bay 21					34	0	27	118	32	48
Santa Monica Bay 22					34	0	32	118	32	59
Santa Monica Bay 23					34	0	38	118	33	5
Santa Monica Bay 24					34	0	39	118	33	15
Santa Monica Bay Center					34	0	47	118	32	33
Santa Monica A	1961	60	quarry rock	330 tons	34	0	34.2	118	31	49.2
Santa Monica B			concrete shelters	44 pieces	34	0	33	118	31	48
Santa Monica C			car bodies & streetcar	5 pieces (disintegrated)	34	0	33	118	31	50.44
Santa Monica Center	1971		concrete pier pilings	100 tons	34	0	34	118	31	47
Marina Del Rey 2 A	1985	65	quarry rock	10,000 tons	33	58	0	118	29	10
Marina Del Rey 2 B					33	58	0.16	118	29	11
Marina Del Rey 2 C					33	58	0.5	118	29	12
Marina Del Rey 2 D					33	58	1	118	29	13
Marina Del Rey 2 E					33	58	0.5	118	29	9
Marina Del Rey 2 F					33	58	1	118	29	10
Marina Del Rey 2 G					33	58	1.5	118	29	12
Marina Del Rey 2 H					33	58	2	118	29	13
Marina Del Rey 2 I					33	58	5	118	29	7
Marina Del Rey 2 J					33	58	6	118	29	11
Marina Del Rey 2 K					33	58	7	118	29	14

Marina Del Rey 2 L					33	58	7	118	29	16
Marina Del Rey 2 M					33	58	8	118	29	7
Marina Del Rey 2 N					33	58	8	118	29	10
Marina Del Rey 2 O					33	58	9	118	29	12
Marina Del Rey 2 P					33	58	9	118	29	15
Marina Del Rey 2 Center					33	58	6	118	29	11
Marina Del Rey 1 Q	1965	65	quarry rock	2,000 tons	33	57	56	118	29	13
Marina Del Rey 1 R	1976		concrete dock floats	120 pieces	33	57	57	118	29	10
Marina Del Rey 1 S	1978		concrete rubble	4,000 tons	33	57	54	118	29	10
Marina Del Rey 1 T					33	57	52	118	29	10
Marina Del Rey 1 Center					33	57	54	118	29	10
Hermosa Beach A	1960	60	quarry rock	330 tons	33	51	15	118	24	50
Hermosa Beach B			concrete shelters	44 pieces	33	51	16	118	24	47
Hermosa Beach C			car bodies	14 pieces (disintegrated)	33	51	13	118	24	49
Hermosa Beach D			streetcar	1 piece (disintegrated)	33	51	11	118	24	46
Hermosa Beach Center			tires	461 pieces	33	51	13	118	24	48
Redondo Beach A	1962	72	quarry rock	1,000 tons	33	50	18	118	24	34
Redondo Beach B			barge	1 piece	33	50	18	118	24	33
Redondo Beach C			cement pipe	350 tons	33	50	17	118	24	31
Redondo Beach D			concrete pilings	700 tons	33	50	16	118	24	33
Redondo Beach E			concrete dock floats	1,700 pieces	33	50	15	118	24	31
Redondo Beach F					33	50	14	118	24	34
Redondo Beach G					33	50	14	118	24	32
Redondo Beach H					33	50	14	118	24	30
Redondo Beach I					33	50	13	118	24	33
Redondo Beach J					33	50	12	118	24	34
Redondo Beach K					33	50	11	118	24	31
Redondo Beach Center					33	50	14	118	24	32
Palawan	1977	120	liberty ship	1 piece	33	49	25	118	24	53
	1978		concrete rubble	6,000 cubic yards						
Bolsa Chica A	1986	85-100	concrete rubble	10,400 tons	33	39	32.86	118	6	2.87
Bolsa Chica B			steel/concrete barges	8 pieces	not found					
Bolsa Chica C					33	39	17.2	118	6	7.7
Bolsa Chica D					33	39	15.65	118	5	58.13
Bolsa Chica E					33	39	1.2	118	6	10.1
Bolsa Chica F					33	38	58.7	118	6	6.3
Bolsa Chica G					33	38	48.7	118	6	20.6
Bolsa Chica H					33	38	42.8	118	6	6.4
Bolsa Chica 9	1992	90	concrete chimneys	800 tons	33	39	18.95	118	5	56.36
Bolsa Chica 10	1993	90	concrete chimneys	800 tons	33	39	19.64	118	6	3.68
Bolsa Chica 11	1994-96	90	Edison light poles	1700	33	39	13	118	6	4.4
Bolsa Chica 12	1995	90	Todd shipyard concrete	18600 tons	33	38	58	118	6	17.5
Bolsa Chica 13	1997	90	Edison light poles	1000 tons	33	39	14.5	118	5	54.4
Bolsa Chica 14	1997	90	Edison light poles	750 tons	33	39	21	118	6	8
Bolsa Chica 15	1997	90	Edison light poles	750 tons	33	39	18	118	6	11
Bolsa Chica 16	1997	90	Edison light poles	750 tons	33	39	15	118	6	12
Bolsa Chica 17	1997	90	Edison light poles	750 tons	33	39	13	118	6	10
Bolsa Chica 18	1998	90	Edison light poles	1000 tons	33	39	10.3	118	5	59.5
Bolsa Chica 19	1999	85	Pier Pilings	62,900 tons	33	39	32.4	118	5	55.5
Bolsa Chica 20	1999	85	Pier Pilings		33	39	29.7	118	5	48.2
Bolsa Chica 21	1999	85	Pier Pilings		33	39	29.2	118	5	57.1
Bolsa Chica 22	1999	85	Pier Pilings		33	39	26.8	118	5	49.2
Bolsa Chica 23	1999	85	Pier Pilings		33	39	26.2	118	5	58
Bolsa Chica 24	1999	85	Pier Pilings		33	39	24.2	118	5	50.6
Bolsa Chica 25	1999	90	Pier Pilings		33	39	6.7	118	5	54.8
Bolsa Chica 26	1999	90	Pier Pilings		33	39	4.1	118	5	55.9

Bolsa Chica 27	1999	90	Pier Pilings		33	39	2	118	5	56.9
Bolsa Chica 28	1999	90	Pier Pilings		33	38	59.2	118	5	57.5
Bolsa Chica 29	1999	90	Pier Pilings		33	38	56.7	118	5	58.7
Bolsa Chica 30	1999	95	Pier Pilings		33	38	54.4	118	5	59.6
Bolsa Chica 31	1999	95	Pier Pilings		33	38	52	118	6	1.1
Bolsa Chica 32	1999	100	Pier Pilings		33	38	48.9	118	6	1.5
Bolsa Chica 33	1999	100	Pier Pilings		33	38	46.4	118	6	2.9
Huntington Beach A1	1963	60	quarry rock	10,000 tons	33	36	55	117	58	51
Huntington Beach A2					33	36	52	117	58	49
Huntington Beach A3					33	36	50	117	58	48
Huntington Beach A4					33	36	49	117	58	47
Huntington Beach B1					33	37	10	117	59	18
Huntington Beach B2					33	37	9	117	59	17
Huntington Beach B3					33	37	7	117	59	16
Huntington Beach C1					33	37	18	117	59	52
Huntington Beach C2					33	37	17	117	59	51
Huntington Beach C3					33	37	15	117	59	50
Huntington Beach D1					33	37	29	118	0	5
Huntington Beach D2					33	37	28	118	0	4
Huntington Beach D3					33	37	26	118	0	3
Huntington Beach D4					33	37	24	118	0	2
Huntington Beach A Center					33	36	52	117	58	59
Huntington Beach B Center					33	37	17	117	59	51
Huntington Beach C Center					33	37	9	117	59	17
Huntington Beach D Center					33	37	28	118	0	4
Newport Beach A	1979	72	concrete rubble/pilings	1,200 tons	33	36	8	117	57	52
Newport Beach B	1981		concrete rubble	2,700 tons	33	36	13	117	57	50
Newport Beach C	1982		concrete blocks	375 tons	33	36	16	117	57	44
Newport Beach E	1984		concrete rubble/pilings	6,400 tons	33	36	7	117	57	53
Newport Beach Center					33	36	13	117	57	49
Pendleton 1	1980	43	quarry rock	10,000 tons	33	19	29.28	117	31	40.04
Pendleton 3					33	19	25.61	117	31	36.59
Pendleton 4					33	19	29.64	117	31	38.76
Pendleton 6					33	19	30.67	117	31	38.66
Pendleton 7					33	19	29.87	117	31	36.88
Pendleton Center					33	19	30	117	31	42
Oceanside 2 1A	1987	42-72	quarry rock	10,000 tons	33	12	15.18	117	26	5.32
Oceanside 2 2A					33	12	20.75	117	26	4.12
Oceanside 2 3A					33	12	24.49	117	26	10.56
Oceanside 2 4A					33	12	31.59	117	26	14.46
Oceanside 2 1B					33	12	24.45	117	25	39.48
Oceanside 2 2B					33	12	31.41	117	25	46.33
Oceanside 2 3B					33	12	37.26	117	25	52.79
Oceanside 2 4B					33	12	44.29	117	25	56.58
Oceanside 2 1C					33	12	43.2	117	25	9.77
Oceanside 2 2C					33	12	47.75	117	25	13.57
Oceanside 2 3C					33	12	54.63	117	25	18.37
Oceanside 2 4C					33	13	2.96	117	25	24.07
Oceanside 2 Center					33	12	40.17	117	25	43.82
Oceanside 1 A	1964	82-100	quarry rock	2,000 tons	33	10	59	117	25	1
Oceanside 1 B	1987	45-90	concrete dock floats	12 modules (100'x5')	33	11	0	117	24	59
Oceanside 1 C					33	10	58	117	25	1
Oceanside 1 D					33	10	59	117	24	59
Oceanside 1 E					33	10	57	117	25	2
Oceanside 1 F					33	10	57	117	24	59

Oceanside 1 G					33	10	54.8	117	25	5
Oceanside 1 H					33	10	54	117	24	59
Oceanside 1 Center					33	10	57	117	25	0
Carlsbad 1	1991	37-60	quarry rock	10,000 tons	33	5	19.49	117	19	13.12
Carlsbad 2					33	5	14.05	117	19	11.04
Carlsbad 3					33	5	9.76	117	19	9.24
Carlsbad 4					33	5	3.52	117	19	7.25
Carlsbad 5*			*positions not exact		33	5	16.8	117	19	14.4
Carlsbad 6*					33	5	11.4	117	19	13.2
Carlsbad 7*					33	5	5.4	117	19	11.4
Carlsbad 8*					33	5	0	117	19	9
Carlsbad 9*					33	5	15.6	117	19	25.2
Carlsbad 10*					33	5	10.8	117	19	22.8
Carlsbad 11*					33	5	4.8	117	19	20.4
Carlsbad 12*					33	4	58.2	117	19	19.2
Torrey Pines 2	1975	44	quarry rock	3,000 tons	32	53	35	117	15	35
			dock floats	1 barge load						
Torrey Pines 1	1964	67	quarry rock	1,000 tons	32	53	12	117	15	50
Pacific Beach 1A	1987	42-72	quarry rock	10,000 tons	32	47	20	117	16	42
Pacific Beach 2A					32	47	25	117	16	45
Pacific Beach 3A					32	47	35	117	16	50
Pacific Beach 4A					32	47	40	117	16	55
Pacific Beach 1B					32	47	24	117	16	30
Pacific Beach 2B					32	47	30	117	16	30
Pacific Beach 3B					32	47	38	117	16	34
Pacific Beach 4B					32	47	46	117	16	35
Pacific Beach 1C					32	47	30	117	16	12
Pacific Beach 2C					32	47	36	117	16	12
Pacific Beach 3C					32	47	44	117	16	14
Pacific Beach 4C					32	47	50	117	16	18
Pacific Beach Center					32	47	35	117	16	35
Mission Bay Park -El Rey	1987	80	wrecked ship		32	45	51	117	16	38
Mission Bay Park- Ruby E		90	wrecked ship		32	46	2	117	16	36
Mission Bay Park Kelp Reef	1991-93	60	concrete rubble		32	46	12	117	16	4
Mission Bay Park -NEL Tower		60	steel structure		32	46	22	117	16	3
Mission Bay Park -Concrete		80-90	concrete rubble		32	45	51	117	16	31
International Reef 1	1992	165	quarry rock	10,000 tons	32	32	40.3	117	14	53.1
International Reef 2					32	32	39.7	117	14	54
International Reef 3					32	32	37.5	117	14	50
International Reef 4					32	32	38.8	117	14	48.2
International Reef 5	2001		concrete rubble	300 tons	32	32	41	117	14	50.5
Missile Tower	1993		4 story missile platform	1 piece	32	32	29.7	117	14	47.4

last update: June 2001

Artificial Fishing Reefs Constructed Around Public Piers

Los Angeles County:

1) Los Angeles Public Fishing Pier (Venice)
2) Manhattan Beach Public Fishing Pier
3) Hermosa Beach Public Fishing Pier

Orange County:

1) Seal Beach Municipal Pier
2) Huntington Beach Municipal Pier
3) San Clemente Municipal Pier

San Diego:

1) Oceanside Municipal Pier