

B. S. Webb



NEW ZEALAND MARINE DEPARTMENT

FISHERIES TECHNICAL REPORT

No. 24

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**The Occurrence of the  
Mud Crab, Scylla Serrata  
in New Zealand**

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J.S. MANIKIAM

WELLINGTON, NEW ZEALAND, 1967.

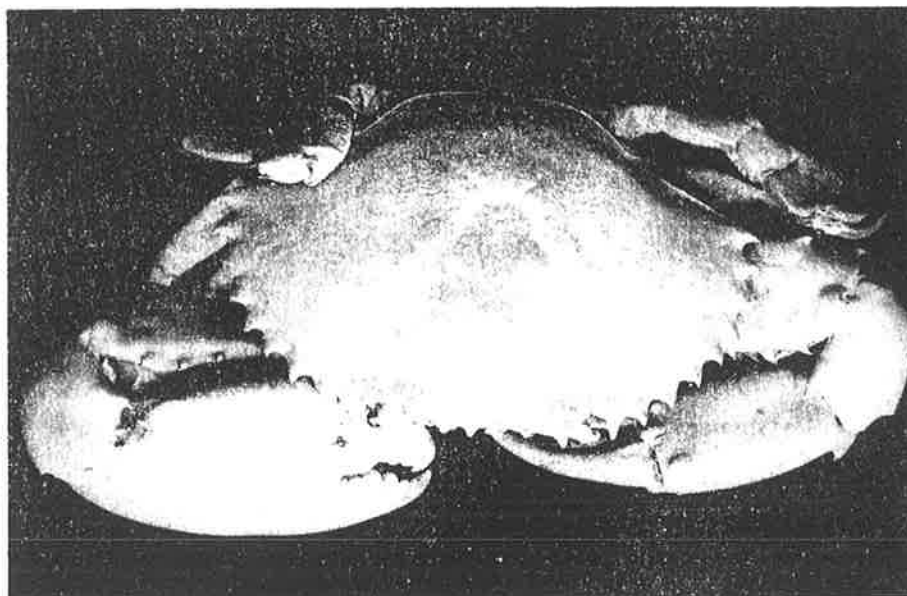
THE OCCURRENCE OF THE MUD CRAB, SCYLLA SERRATA

IN NEW ZEALAND

J.S. MANIKIAM

DEPARTMENT OF ZOOLOGY

VICTORIA UNIVERSITY OF WELLINGTON



WELLINGTON, NEW ZEALAND

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## INTRODUCTION

Scylla serrata, known in Australia as the "mud crab" is the largest of the Australian portunids in terms of bulk and is greatly sought after as food. During 1965-66 the Australian catch, mainly from Queensland, exceeded 268,000 pounds in weight (Australian Fisheries Newsletter, March, 1967). This large Indo-Pacific swimming crab has been included in the New Zealand faunal list since 1865 (Dell 1964). Since then, however, the species has not been recorded in New Zealand until Dell reported some seven species from the north-eastern coast of the North Island.

According to Stephenson and Campbell (1960) S. serrata occurs in Australia from central Queensland to northern New South Wales. It lives in muddy estuaries lined with mangroves, penetrates upstream into waters of very low salinity, and occurs down to four fathoms in the open sea. New Zealand specimens have been collected from similar areas in Northland, mostly by netting.

In discussing the significance of the recent New Zealand occurrence of S. serrata, Dell (1964) dismisses the theory that species has been present in small numbers but has remained unnoticed in northern New Zealand. Since a large percentage of our total crab fauna shows relationship with Australia and have probably been derived from there, Dell thinks it most likely that the present specimens represent a recent invasion from that country either in a larval form or as adults.

The establishment of S. serrata in New Zealand is of more passing interest in view of the economic potential of these crabs. Dr Powell of Auckland Museum indicated (pers. comm.) that S. serrata had established itself in Northland judging from the number of reports of catches but suggested that these edible crabs may have suffered rather heavily at the hands of Northland amateur fishermen. Dell's remarks on the establishment of S. serrata

in New Zealand may be summarised thus:-

1. From the recent occurrences the species is obviously established temporarily in moderate numbers over a fairly wide area.
2. The question of its ultimate establishment depends upon whether the species manages to breed successfully.
3. Some degree of protection may be required if it is considered desirable to establish this crab in New Zealand.

This investigation was initiated to contribute more information on the occurrence of S. serrata in Northland and to discover if it is successfully breeding.

The writer has had some experience in catching mud crabs in the Fiji Islands. Here this specimen is not usually known to burrow. During daytime they are taken tangled in nets and frequently clinging to line baits. The commercial catch is made at night. Fijian fishermen look for mud crabs at river mouths and coasts fringed with mangroves and recognise this crab's typical habit of sinking, when disturbed, into soft mud or sand at water's edge. These fishermen are most adept at taking these crabs with bare hands, and tying their claws with material similar to flax, after which they are sold alive on the local markets. A small quantity is now being exported fresh from Fiji to the United States of America.

Both commercial and amateur fishermen, operating along the east coast of Northland were contacted and as much information as possible was obtained about the occurrence of S. serrata. From these reports prospective areas for field work were determined, and addresses of individuals likely to provide further assistance were compiled. Photographs of S. serrata were distributed fairly

widely and a specimen obtained from Australia was shown to all from whom I sought information.

A 25-yard net (2-inch stretch mesh wings and  $\frac{1}{2}$ -inch stretch mesh bag) was used as a set net and for beach seining. Two craypots were used in Otaha Estuary. For night work an electric torch, hand net and spear were used.

The period of investigation in the field extended from 13th of February till 26th February, 1967.

### INVESTIGATION AREAS AND RESULTS

The areas in Northland chosen for investigation were as follows:- Kerikeri Inlet, Otaha River estuary, Awanui Harbour, Utauri and Paroa Bays (near Russell) and Waima and Omanaia Rivers (Hokianga Harbour).

The factors influencing the choice of these areas included, reports of sightings or catches of mud crab, the existence of habitat similar to those described as its main habitat in Australia, and assistance promised by local residents including commercial fishermen.

KERIKERI INLET, Bay of Islands, (Map.1) was chosen because of its mangrove coastline and because of two reported specimens taken in this region. On further investigation one of these was found to have been taken in the Otaha River estuary but this preserved specimen is displayed in Kerikeri. (More information concerning these specimens are displayed below). Kerikeri was used as a base to investigate both the Otaha and Takou River estuaries.

The mangrove swamps around Kerikeri are extremely difficult areas to traverse by foot and hence a dinghy was used to examine the coastline at night. Four hours were spent with a torch and hand net in the region of Kapiro Road Jetty and Kerikeri River.

The rocky sand foreshore at the end of Kerikeri Inlet Road was similarly searched. Numerous small crabs were collected above the waterline but none bore any resemblance whatsoever to S. serrata. The net was set all night but did not catch any crustacea at all.

OTAHA RIVER ESTUARY (Map.2) One female specimen has been recorded from this area. The mouth of the river consists of clean, firm sand but 500 yards upstream mangrove swamp provides a good habitat for S. serrata. Two small crayfish pots with filleted snapper as bait, as well as the net were set overnight at the points indicated on the map. The crayfish pots did not catch any fauna at all while the net produced only a few tripterygians.

TAKOU RIVER ESTUARY (Map.2) A large mud crab was taken here during March, 1964. Both banks of this estuary, consisting of firm sand except in some areas where mangroves are becoming established, were examined during the hours of darkness. The seine net was dragged at nine places in the estuary. No mud crab was encountered.

RUSSELL (Map.3) One specimen from Russell Wharf was reported by Dell (1964). Various fishermen and residents interviewed did not know who had taken this crab but they did have knowledge of large crab claws washed up on the local beaches. The mangrove swamps at Utauri Bay was examined at night and the net was set overnight without success. A commercial size seine net was used at Paroa Bay and these collected teleosts only.

AWANUI HARBOUR (Map.4) This large harbour is almost entirely fringed with mangroves and at least three specimens are known from this area, including one female. Night examinations of Print Creek region (Kaimaumau) and the mouth of the Awanui River

were carried out without success. Netting in the Kapiti Channel between the mouth of Awanui River and Okatakataka Island also proved futile. Set net at Print Creek (Kaimaumu), produced some mugilid teleosts, freshwater eels, and tripterygions but no crustacea.

HOKIANGA (Map.5) Although Northland's west coast appears to be as suitable a habitat for S. serrata as the east coast, to date no specimens have been reported from this coast. In view of the lack of success along the east coast, it was decided to examine a small portion of the Hokianga Harbour. Near the mouths of Waima and Omanaia Rivers, lined with thick mangrove growth, the banks consist of very soft mud and are extremely difficult places to work in. The net was set in the Omanaia River without success. All local residents living near the two rivers who were interviewed had not heard of or seen a mud crab.

#### RECORDS OF SYCLLA SERRATA IN NEW ZEALAND

While field work failed to locate any live mud crab, interviews with numerous amateur and commercial fishermen has resulted in the addition of another ten specimens to the previous list of seven occurrences. The record to date is as follows:-

1. Seven specimens recorded by Dell (1964), all taken during 1964.
2. Otaha Bay, Purerua Peninsula - 20 miles north of Bay of Islands. Taken by Mr S. Stringer, of Moerewa, Northland, January, 1965, while netting in a tidal river close to the sea in four feet of water. Was preserved but later damaged and thrown away. Sex not known. 8 inches carapace width. An illustration of this specimen appeared in "Dive", N.Z. Underwater Magazine, Volume 5(4). Mr Stringer took a larger specimen during December, 1964, at the same place.



3. Kerikeri Inlet, Bay of Islands. Speared by Mr Noel Jordan, 5th December, 1965, while flounder fishing, in 20 inches of water amongst mangroves. Carapace width  $8\frac{1}{4}$  inches. Male. Specimen preserved in Whangarei Museum. (Information supplied by Mr J. Donnelly, Curator, Whangarei Museum).
4. Te Kao, Parengarenga Harbour. Collected by Mr A. Subritsky 23rd March, 1965. Carapace width  $6\frac{3}{4}$  inches. (Information supplied by Mr J. Donnelly).
5. Otaha River Estuary, tangled in set net at night (little mangrove) in 8 inches of water. Collected by Mr F. Atkinson, Puketona, Northland, December 1964. Female,  $7\frac{1}{4}$  inches carapace width. Specimen preserved in Booth's Craft Shop, Kerikeri. About this time Mr Atkinson saw two of these crabs disappearing in soft sand with only claws projecting. A very large claw of this species was also collected by Mr Atkinson at that time.
6. Takou River Estuary, Takou Bay, tangled in net in 2-8 feet of water. Collected by G.H.B. Ward, 36 Duxbury Avenue, Northcote, March, 1964. Male. Seven inches carapace width. Specimen preserved in the Auckland Museum.
7. Awanui Harbour, netted by Mr R. Rule, March, 1964. Carapace width 8 inches approximately. Another specimen of similar size was taken in the same area by Messrs C. Cossen and B. Richards during 1964.

#### DISCUSSION AND CONCLUSIONS

The difficult task facing a researcher soon becomes apparent when one considers that the localities which have yielded S. serrata are being fished regularly by local residents and nearly all of them have yet to see a mud crab. If these crabs have established themselves in Northland, then at present they are obviously in such moderate numbers and over such a wide area

that it is unprofitable for any investigator to set out in search of them with a view to studying any aspect of their life history.

After a week in the field, the investigation resolved itself into a search for, and analysis of, information from residents living in areas where S.serrata had been collected or areas which from description or personal experience appeared most likely to yield results. While the fishing techniques used to catch this species produced negative results, contacts with Northland residents has resulted in the addition of ten more known occurrences to the previous list of seven.

From an analysis of all the information available concerning these seventeen occurrences the following four important points have emerged:-

1. Nearly all of the specimens have been taken by amateur fishermen, in harbours, estuaries and the open sea, usually tangled in nets.
2. All specimens were adults, whose carapace width ranged from five to eight inches.
3. Only two S. serrata were recognised and reported as females and neither showed any evidence of eggs.
4. Fourteen of these crabs were taken during 1964; two early in 1965 and one during December, 1965. None have been reported since.

The absence of reports of juvenile S. serrata and of adult catches before 1964 (except for Heller's doubtful record of 1865) or after 1965 would seem to suggest that the seventeen recorded specimens in New Zealand represent an adult invasion of the species which has subsequently failed to establish itself.

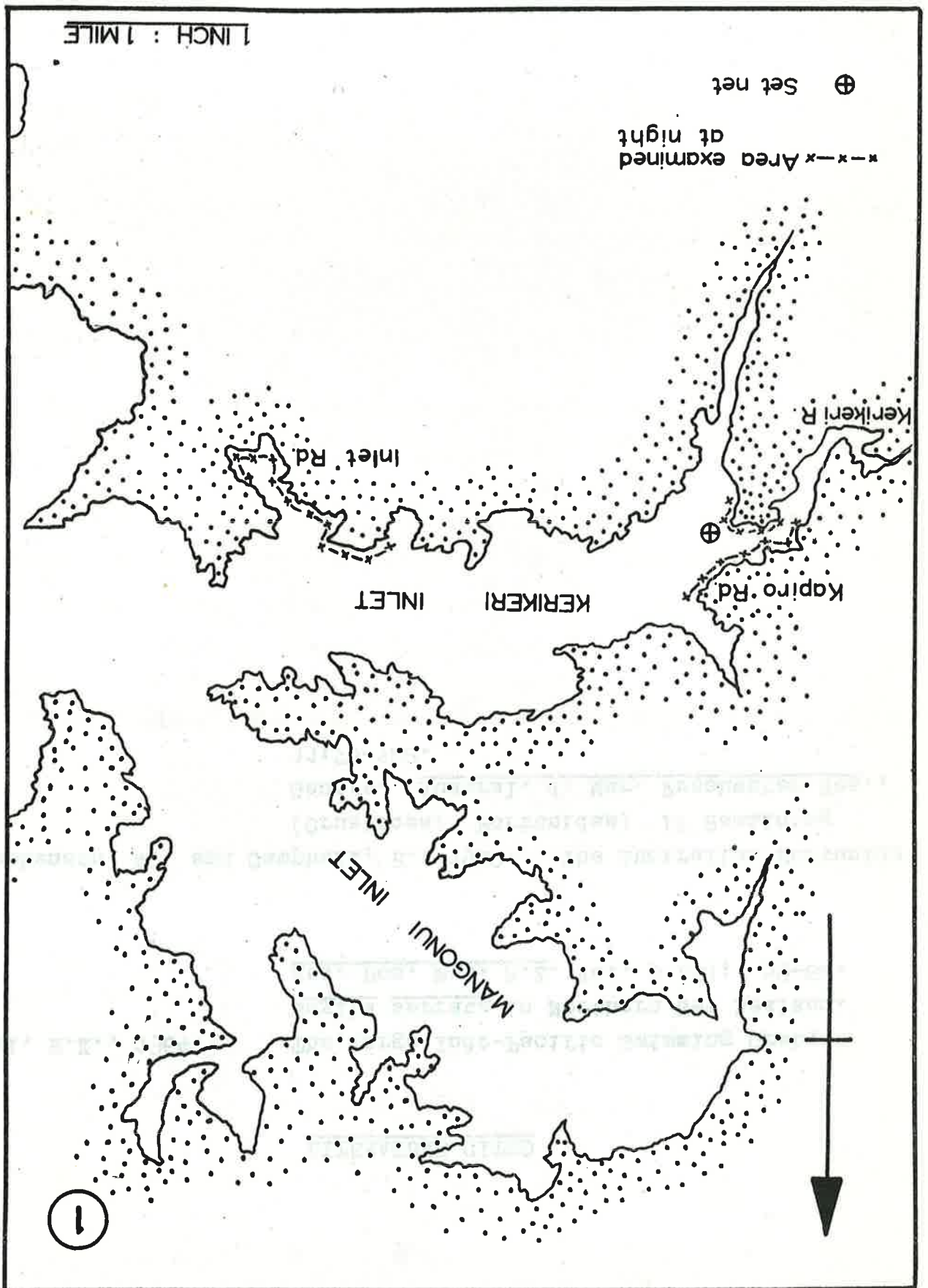
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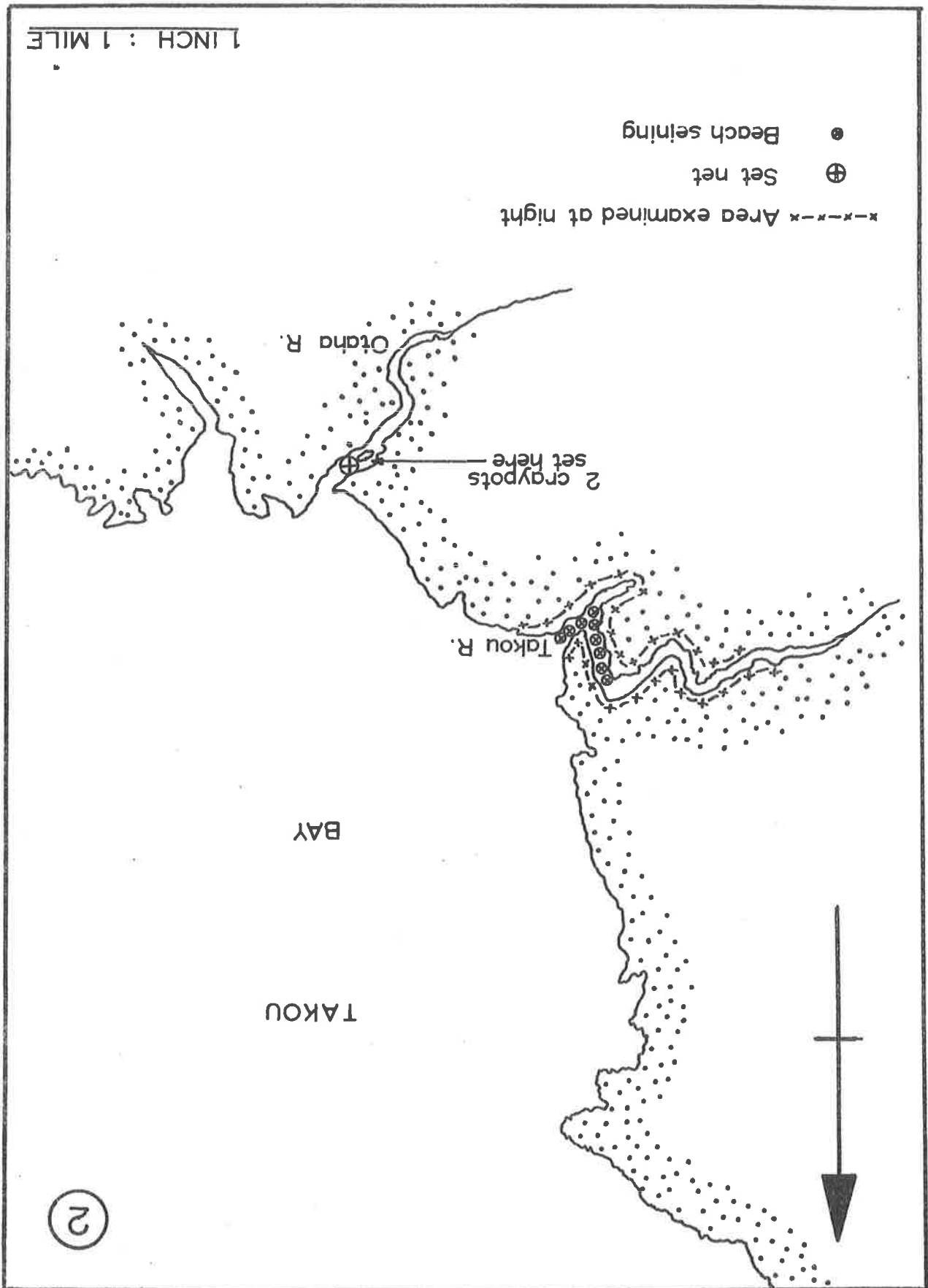
This research project was suggested by Dr R.B. Pike, Senior Lecturer in Zoology, Victoria University of Wellington, to whom the writer is indebted for helpful criticisms. All expenses of this project have been met by a grant from the Fisheries Division, New Zealand Marine Department. The assistance rendered by the following is gratefully acknowledged: Dr R.K. Dell, Director, Dominion Museum; Mr A.W.B. Powell, Auckland Museum; Mr S. Booth, Mr J. Booth, Mr P. Lupi, Mr R. Robinson, Mr O.H. Best, and Mr and Mrs G. Strongman, all of Kerikeri; Mr and Mrs P. Hou, Takou Bay; Mr M.C. Marshall, Kaitaia College; Mr Ross Michie, Kaitaia; Mr Bill Walker, Mr B. Richards, and Mr S. Rule of Awanui; Mr M.J. Donnelly, Curator, Whangarei Museum; Mr S. Stringer, Moerewa.

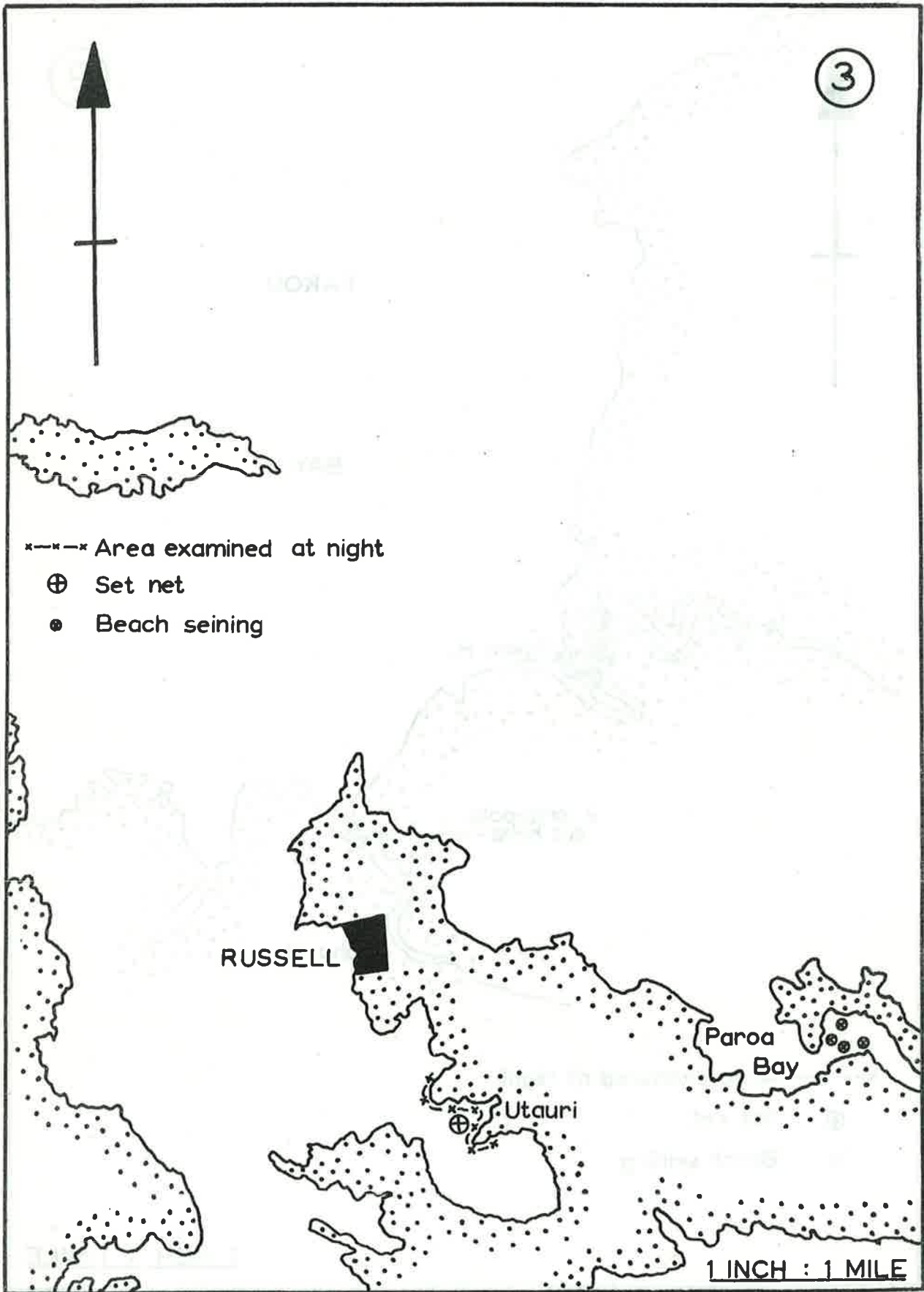
My special thanks to Mr Frank Begley of Awanui, and Mr R. Irving, Russell, who spared much of their time to assist in field work, making available their nets and boats.

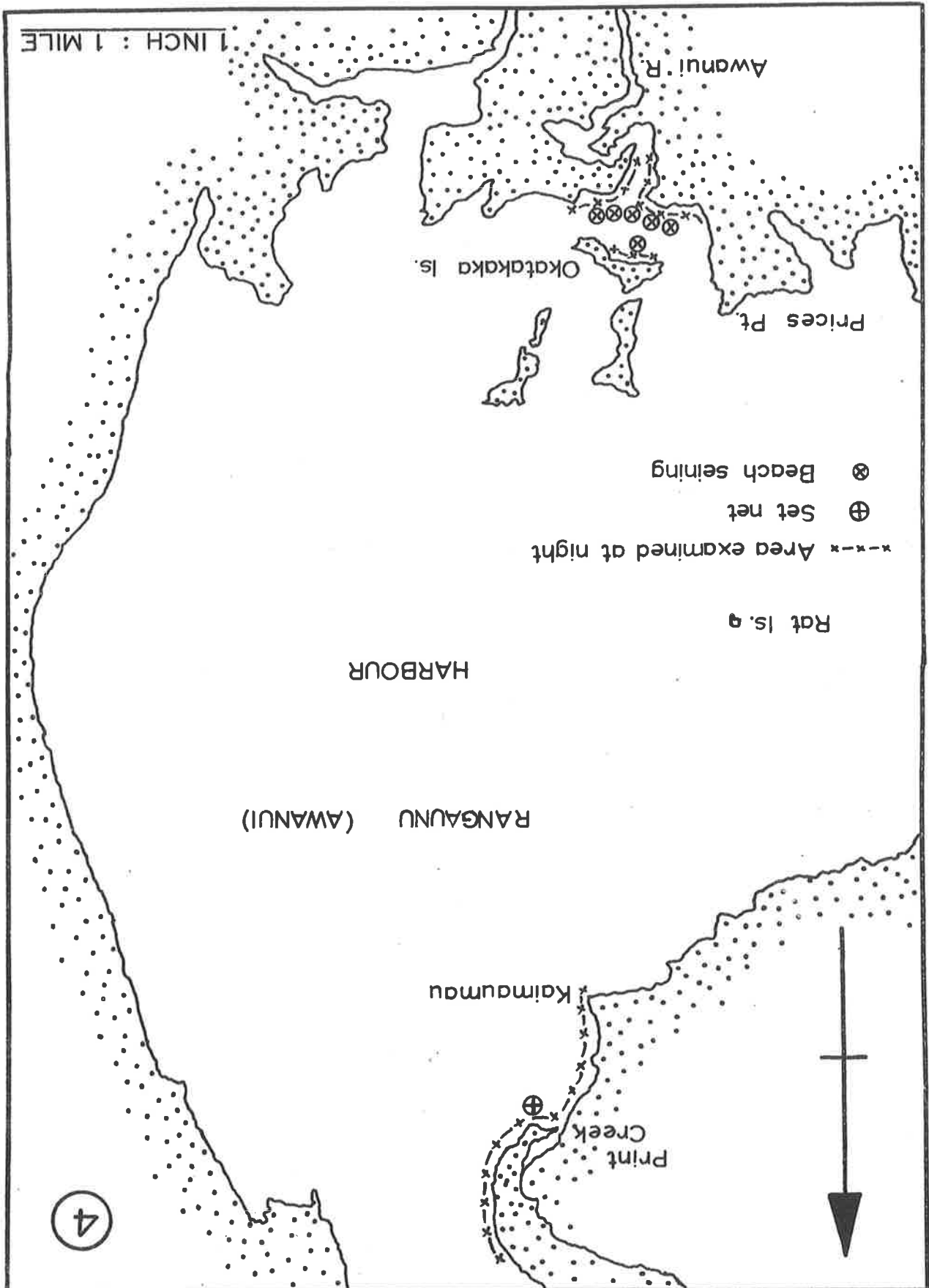
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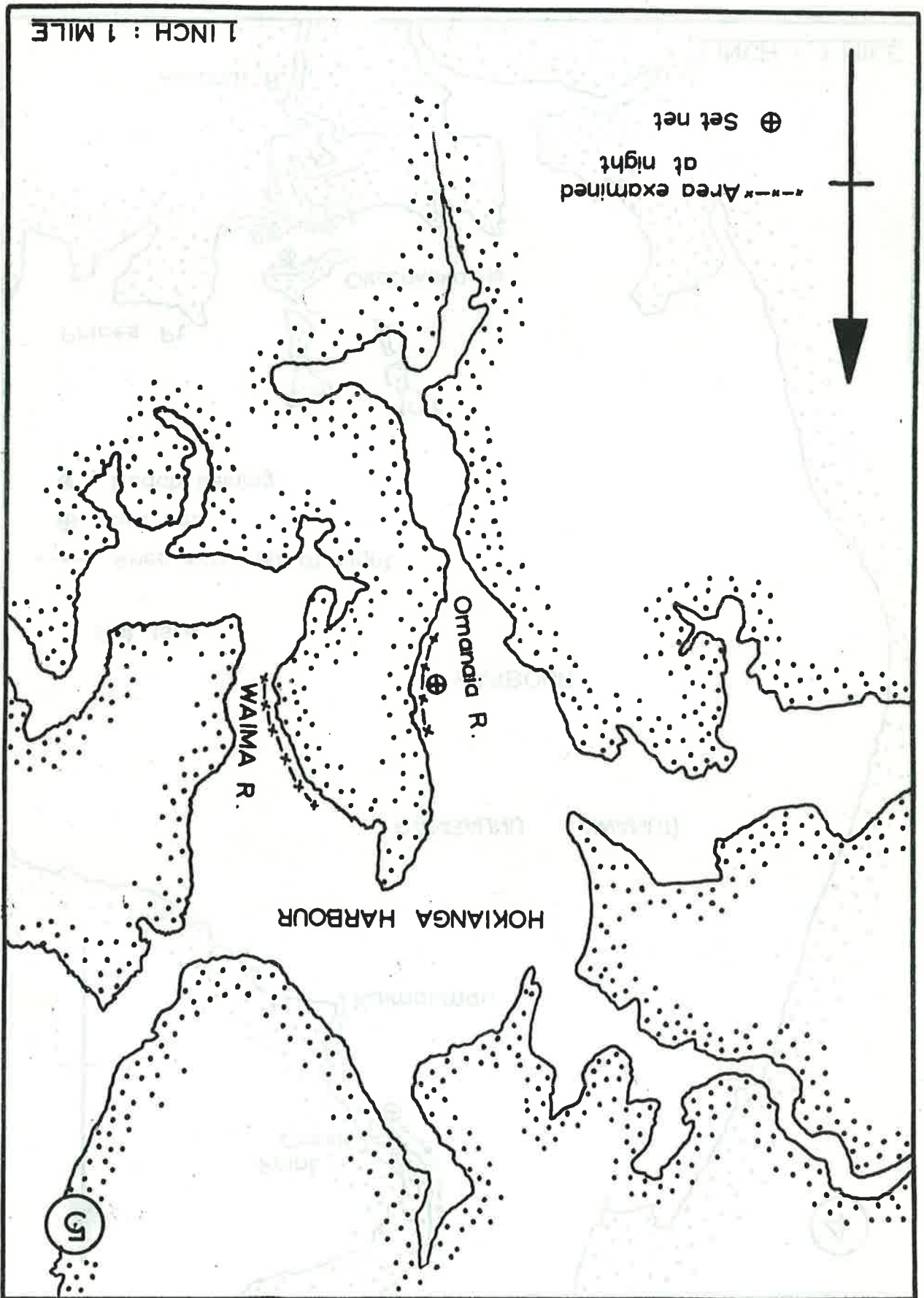












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