NEW ZEALAND MARINE DEPARTMENT

FISHERIES TECHNICAL REPORT
No. 51

AN EXPERIMENT TO DETERMINE THE SUITABILITY OF CONCRETE SLAB SPAT COLLECTORS FOR ROCK OYSTER CULTIVATION ON THE HARD LIMESTONE FORESHORE AT KAIPARA HARBOUR

L. CURTIN

WELLINGTON, NEW ZEALAND

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CONTENTS

I. SUMMARY

In the summer of 1970 four hundred concrete spat collectors were set out on an area of hard limestone foreshore at Kaipara Harbour. The method of setting out was similar to an established technique used in Europe and New South Wales, where an inclined undersurface of each collector is presented for settlement in successive years; oysters being matured in the third year on trays.

A heavy catch of rock oyster spat was obtained on the undersurface of all collectors. There was no significant difference in the density of settlement at various levels.

Indications are that the technique should be suitable for developing these hard shores at Kaipara unsuitable for other cultivation methods.

II. INTRODUCTION

During the past two years commercial rock oyster farming has commenced in Kaipara Harbour. Development has mainly been in tray farming using naturally occurring oysters to fill trays.

Attempts to introduce "stick farming" methods (the standard practice in N.S.W.) to the Kaipara have so far proved unsuccessful. In all Marine Department experiments to date, timber or asbestos cement sticks carrying small oysters placed on growing racks built over a mud bottom, have been densely covered with the brackish water mussel (Modiolus fluviatilus). The result being that oysters were pushed off the sticks before they matured. A heavy mussel settlement has been obtained on all suspended material at levels from low water to the top of the natural oyster zone. (Chart datum + 8').

It is interesting to note, however, that in the major natural oyster areas on the hard shores of the Kaipara, this mussel is found only below the natural oyster zone. It is not in evidence at all in the more saline areas where the Tauhoa, Oruwharo, Otamatea and Arapoa Rivers join the main Harbour.

Until the Modiolus fluviatilus problem is resolved it would appear that the best method of oyster farming in the Kaipara is to set out spat collectors on the hard shores and to mature the oysters in trays.

III. METHODS

Four hundred concrete slab collects were set out in pairs, four feet apart, in parallel rows. All collectors were of standard size, 24" x 12" x 1½" and each had two holes through the concrete close to each end. Each row was first set out in lines 2 feet apart. Pairs of collectors were wired together at the top. The bottom edges were opened up and set on the line. When each row was completed a small trench 1" deep was cut in the hard limestone at

the base of each collector. The bottom of each slab was then moved into its trench giving stability against wave action as the area was rather exposed. The spacing used set the collectors at an angle of approximately 60°, giving an undersurface for increased settlement.

IV. RESULTS

Every collector received a heavy settlement of rock oyster spat on the undersurface. The settlement was evenly distributed over the whole surface. A minor settlement occurred on the upper surface of each collector. For commercial purposes there was no significant difference in the settlement at various tide levels. Barnacle settlement was insignificant. At the time of compiling this report, oysters were approximately 5 months old. All were growing vigorously with no apparent mortality. Settlement at various levels is set out in Fig. 1.

V. DISCUSSION

In this method of oyster cultivation the slabs would be left in position until the following November. At this time the outer surfaces would be cleaned, if necessary. The collectors would then be turned back to back and rewired. A clean undersurface would be ready for spat settlement in December-January.

The following November, when oysters on the outer surface were approximately 2 years old, they would be cleaned off and placed in trays to mature. The concrete collectors would again be reversed back to back.

One would expect to harvest oysters from trays in late spring-early summer in Kaipara because at this time they would be at their best condition. It can be seen that by reversing collectors annually a crop can be harvested off trays each year once the system is established.

For easier removal of oysters a wash of equal parts cement-lime-sand could be applied to collectors but present indications are that this is not necessary.

On most hard shores in the Kaipara there is a run-off of silt down the slope of the beach. It is recommended that collectors be set out as illustrated with their narrow edge facing up and down the slope. This causes no interference to the natural run-off and has the advantage of allowing the normal wave pattern to wash and scour the area. Individual rows should be four feet apart, with a 12 foot gap after each fourth row to give access for a punt or tractor.

VI. CONCLUSION

It will probably be some time before the Modiolus fluviatilus infestation problems in relation to rock oyster stick farms at Kaipara are resolved. Because of the lack of areas suitable for raft culture or dredge beds, those persons attempting to derive a livelihood from oyster farming in the Kaipara should consider establishing this type of cultivation, to provide the necessary stock for their tray farms.

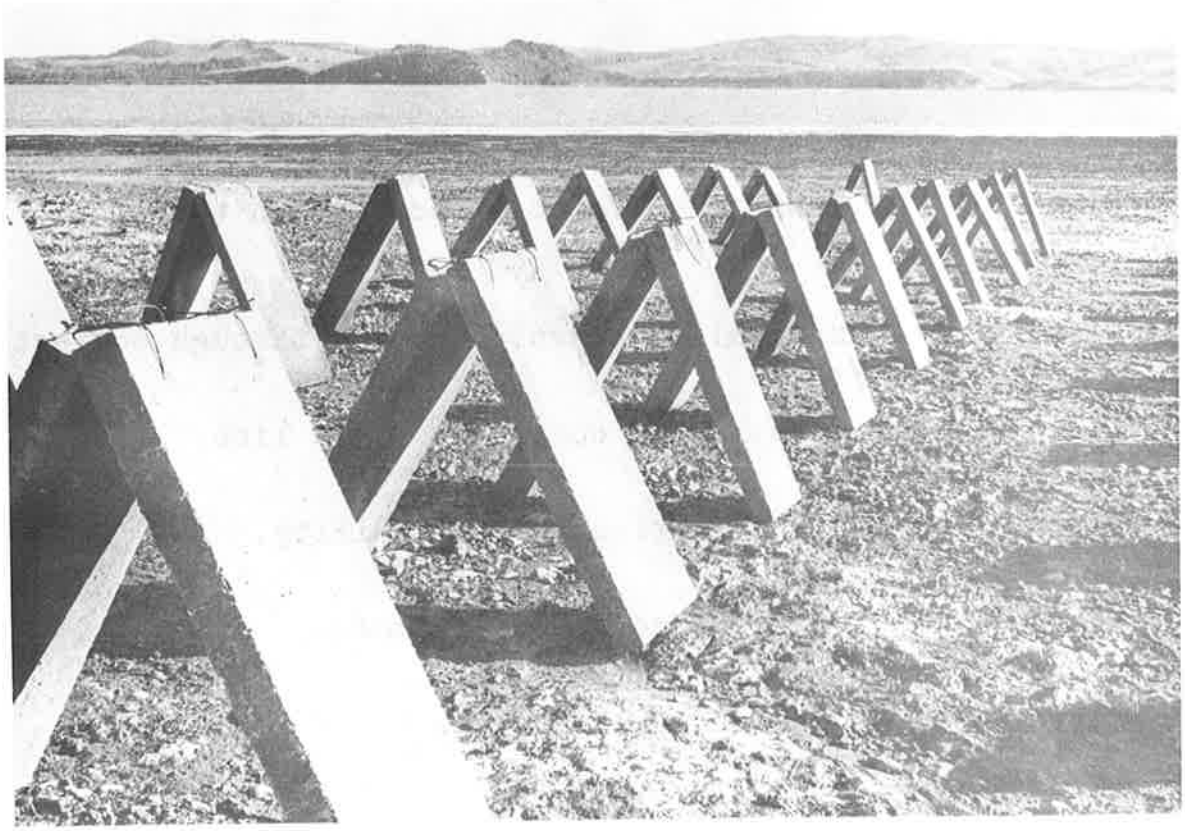

PLATE 1

PLATE 2

PLATES, FIG. 1.

Plate 1: Rows of collectors facing down the slope of the beach.

Plate 2: Natural wave action moving through collectors.

Plate 3: Setting the collectors to a line.

Plate 4: Making a trench for stability.

Plate 5: Undersurface of collector.

Plate 6: Uppersurface of collector.

Fig. 1: Diagrammatic view of area density of catch at various levels.

PLATE 3

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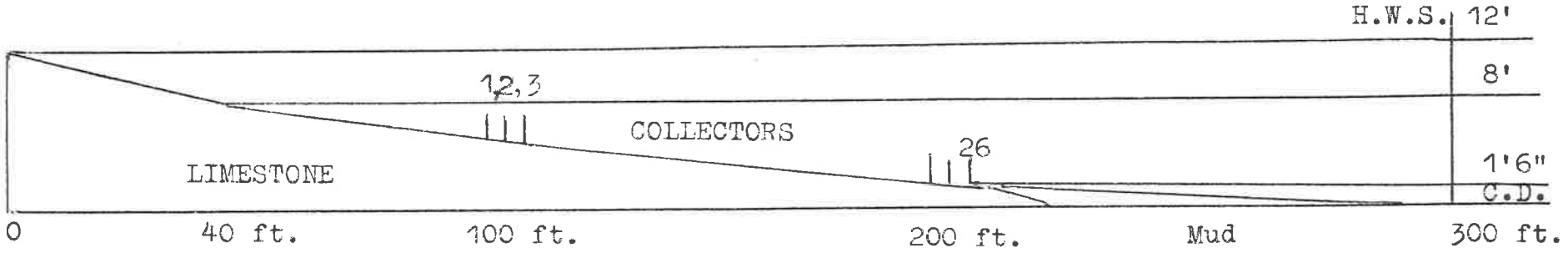
PLATE 4

PLATE 6

FIG. 1.



collector number	1	2	3	4	5	6	7	8	9	10	11	12	13
oyster settlement undersurface	497	392	483	392	455	518	420	448	490	518	497	350	392

collector number	14	15	16	17	18	19	20	21	22	23	24	25	26
oyster settlement undersurface	448	413	406	420	441	392	448	392	483	490	476	385	399

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