NIWA

Taihoro Nukurangi

Foveaux Strait Oyster Stock Assessment

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Final Research Report for
Ministry of Fisheries Research Project OYS2001/01
Objective 5

National Institute of Water and Atmospheric Research

October 2002

Final Research Report

1. Date: 09 October 2002

2. Contractor: NIWA

3. Project Tile: Foveaux Strait oyster stock assessment

4. Project Code: OYS2001/01

5. Project Leader: Keith Michael

6. Duration Project:
Start date: 1 October 2001
Completion date: 30 September 2002

7. Executive Summary

This report summarised the research completed under objective 5 OYS2001/01: estimating the size structure of oysters caught by commercial fishers during the 2002 Foveaux Strait oyster season. No report was request by MFish for this objective, but is provided to complete the documentation for OYS2001/01.

A total of 74 size samples were measured over the 2002 oyster season between 4 April 2002 and 16 August 2002. In all 15 580 oysters were measured for length and height to provide data on the size structure of the commercial catch from 11 of the 12 vessels fishing oysters and from sampling spread over the entire season.

8. Objective

1. To implement a shed sampling programme to describe the size structure of the commercial catch.

9. Methods

9.1.1 Introduction

A five-year strategic research plan (Andrew et al. 2000) accepted by MFish and the Bluff Oyster Management company proposed to develop a length-based management model for the Foveaux oyster stock assessment; modelling changes in population size, the impact of *Bonamia exitiosus* on the oyster population, growth, mortality, and fishing mortality. Information on the population size structure of oysters in Foveaux Strait and the size structure of the commercial catch are required to develop the length-based models for this fishery. Population size data from the fishery was collected in the October 1999 and 2001 surveys (Michael et al. 2001, Michael et al. in press.). The size structure of oysters in the commercial catch was estimated in a sampling programme run over the 2002 oyster season. NIWA employed and trained local contract staff for this programme. This investigation was carried out in collaboration with the Bluff Oyster Management Company and the Ministry of Fisheries.

Oysters are landed daily live in their shells and transported to opening facilities where they are shucked and packed. There are eight licensed fish receivers located in Bluff, Invercargill, and further a field, opening oysters from the 12 vessels fishing oysters in 2002. With the permission of the owners and factory managers, the commercial catch was sampled at the opening facilities in Bluff and Invercargill.

The sampling programme measured several size samples from each oyster vessel over the 2002 season. Fishing position data contained in the 2002 oyster fishers logbooks should allow these size structure data to be related to specific patches of oysters.

9.2. Operational procedure

NIWA contracted staff from Bluff with relevant work experience or qualifications, and with their own transport to carry out the sampling. NIWA provided two days onsite training for staff (including safety procedures) and monitored the sampling and data quality on a weekly basis from Greta Point.

Staff attempted to measure one sample from each oyster vessel in the fleet every two weeks. One quarter of a randomly selected sack of oysters (an average of 774 oysters per sack) was measured and the number of small oysters and spat 10–49 mm counted, in two size groups estimated by eye.

A new data form was used for each vessel (Figure 1). Sampling, catch and vessel details were recorded on each sheet used. Total catch for the day (sacks) was recorded when available from factory records of the catch effort landing return (CELR). All oysters were fitted against a standard oyster ring. Recruit size oysters fail to pass through the 58 mm internal diameter ring. The oysters were tried against the ring by twisting with gentle pressure without breaking any shell. Recruited oysters were assigned as "R" in the size category field. Pre-recruit oysters pass through the 58 mm ring but not the 50 mm ring. These oysters were assigned a size category "P". Each oyster was measured for length and height (Figure 2) to the nearest mm down using callipers. All smaller oysters were assigned to a 49–20 mm or 19–10 mm size group by eye and counted. Once measured, all oysters were returned to the sack from which they came.

The data was mailed to NIWA, Greta Point weekly.

10. Results

A total of 74 size samples were measuring over the 2002 oyster season. Sampling was carried out on 38 days between 4 April 2002 and 16 August 2002. In all 15 580 oysters were measured for length and height, and 160 spat 20–40 mm in length and 398 spat 10–19 mm in length were counted. On average, that is one spat per 28 oysters suggesting low recruitment of 0+ and 1+ oysters. Oyster vessels fish between 1 and 3 quotas, and vessels sampled more often during the 2002 season fished 2 and 3 quotas. The number of samples taken from each vessel is shown in Table 1.

The total number of oysters caught by each vessel each day sampled from catch effort landing returns (CELR) and catch landing returns (CLR), were not available at the time of this report to allow length frequencies to be weighted by catch. Unweighted length frequencies are shown in Figure 3. The length height relationship of oysters sampled is shown in Figure 4.

Table 1. The dates sampled and total number of samples taken from each vessel during the 2002 oyster season.

Vessel	Vessel No.	Date sampled									No. of samples
Ariel	8252	4-Apr	16-Apr	30-Apr	23-May	11-Jun	2-Jul	16-Jul	26-Jul	19-Aug	9
Golden Lea	8200	4-Apr	18-Apr	30-Apr	13-May	11-Jun	20-Jun	1-Jul	29-Jul	19-Aug	9
Golden Quest	9074	18-Apr	13-May	14-May	23-May	2-Jul	29-Jul	15-Aug			7
Polaris	9002	4-Apr	16-Apr	30-Apr	13-May	31-May	10-Jun				6
Toiler	8263	4-Apr	18-Apr	23-May	31-May	10-Jun	28-Jun	16-Jul	26-Jul	15-Aug	9
Southern Enterprise	8106	4-Apr	16-Apr	30-Apr	14-May	11-Jun					5
Bargara	8297	9-Apr	7-May	12-May	14-Jun	29-Jun	1-Aug				6
Nga Romina	8201	12-Apr	23-Apr	12-May	14-Jun	4-Jul	15-Jul	1-Aug	16-Aug		8
Argosy *	8107										0
Lucy Star	8326	11-Apr	16-Apr	20-May	21-May	14-Jun					5
Torea	8264	8-Apr	22-Apr	12-May	13-Jun	29-Jun	16-Jul				6
Rita	8229	29-Jun	18-Jul	30-Jul	16-Aug						4

* Access to the Argosy's catch denied to sampling staff.

11. Publications

Nil.

12. Data Storage

These data will be stored on the Foveaux Strait oyster database.

13. Acknowledgments

We would like to thank Donny Sayers, Alison Roe, and Kerry Sayers for their efforts shed sampling, also the factory managers and staff of Barnes Oysters, Superior Oysters, Awarua Tio, Johnson's Oysters and Independent who provided assistance and work space at their facilities.

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14. References

Andrew, N. L.; Hine, P. M.; Cranfield, H. J.; Dunn, A.; Michael, K. P. (2000). Foveaux Strait dredge oyster strategic research plan for the period 2000–2004. National Institute of Water and Atmospheric Research. Final Research Report to the Ministry of Fisheries for Project OYS1999/01, Objective 4 (revised objective).

Michael, K. P.; Dunn, A.; Andrew. N. L.; Breen, P. A. (2001). Foveaux Strait dredge oyster (*Tiostrea chilensis*) stock assessment, 1999. Ministry of Fisheries. *New Zealand Fisheries Assessment Report 2001/38.*

Michael, K. P.; Dunn, A.; Diggles, B. K. (in prep.). Foveaux Strait dredge oyster (*Ostrea chilensis*) population and *Bonamia* surveys, October 2001. Ministry of Fisheries. *New Zealand Fisheries Assessment Report in press.*

NIWA **FOVEAUX STRAIT OYSTER COMMERCIAL CATCH SAMPLING**

Size data record

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Sample No.	Date Sampled Day	Month	Year	Time Sampled (NZST)	Recorder

Vessel	Vessel No.	Date Landed Day	Month	Year	Total Catch CELR (sacks)

Size Category	Length (mm)	Height (mm)	No. spat 49-20mm	No. spat 19-10mm	Size Category	Length (mm)	Height (mm)	No. spat 49-20mm	No. spat 19-10mm

1) Start a new form for each vessel sampled.
2) Measure oysters to the nearest mm down.
3) Size category: R, recruits 58mm and larger; P, pre-recruits 50-57mm measured with reference ring gauges.
4) Total catch, record no. sacks from CELR.

FS_oys01

Figure 1. The Foveaux Strait commercial catch sampling form

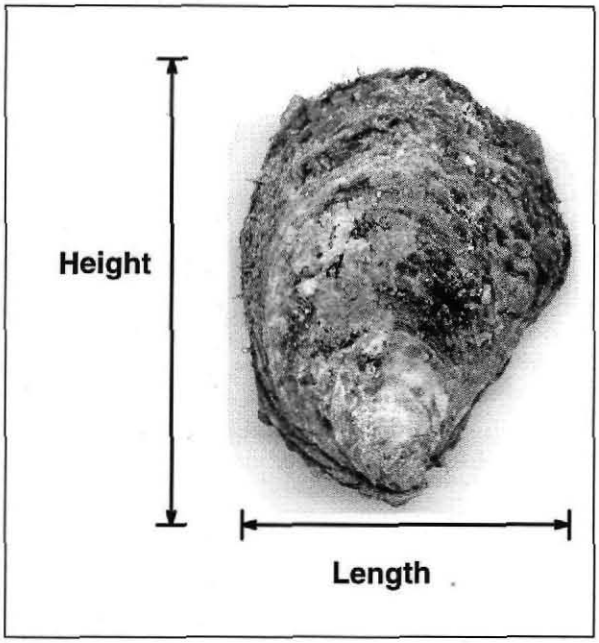

Figure 2. An oyster showing length (anterior-posterior axis) and height (dorsal-ventral axis) dimensions.

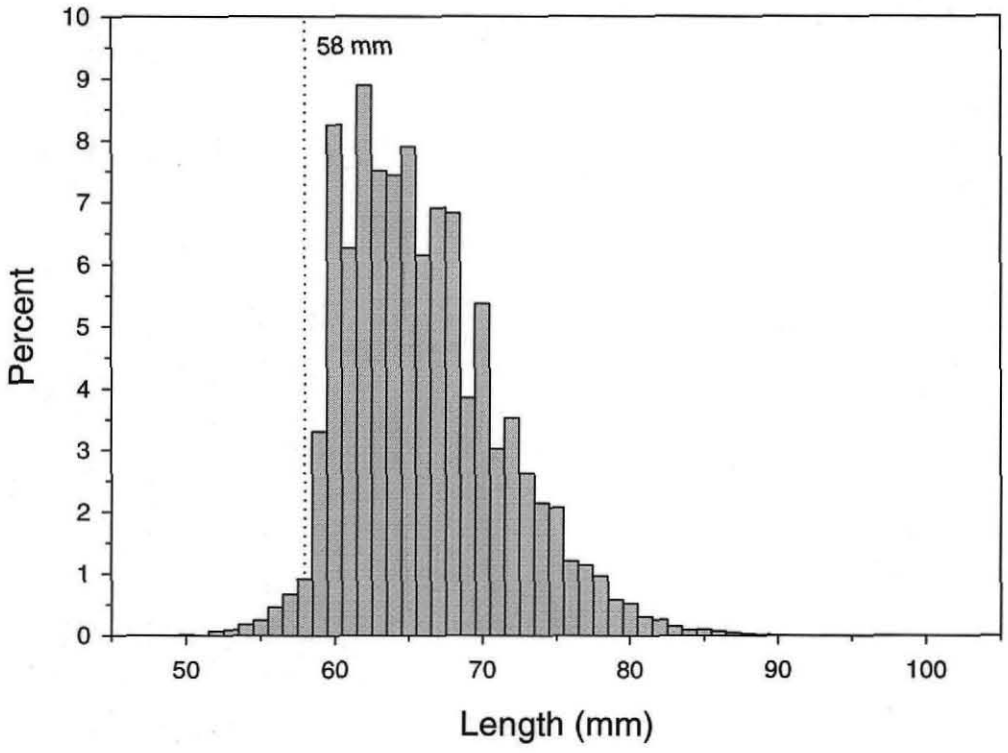

Figure 3. Percent length frequency distribution of 15 580 oysters sampled from the commercial catch during the 2002 oyster season.

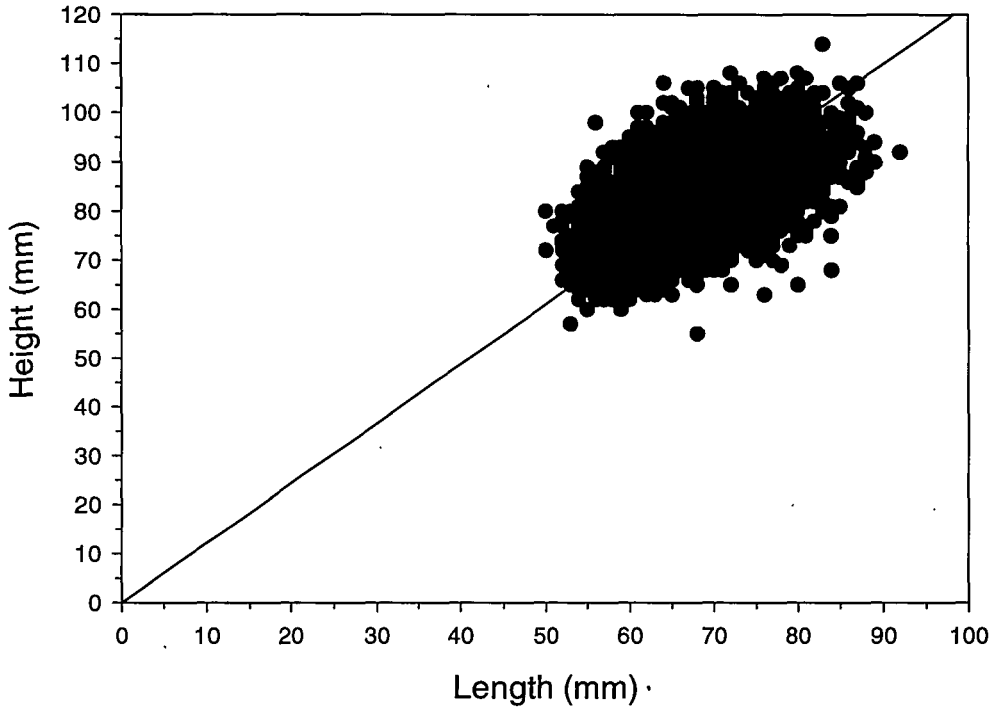

Figure 4. Length height relationship of 15 580 oysters sampled from the commercial catch during the 2002 oyster season.