

Project: Stock assessment of rock lobster

Project Code: CRA2009/01

Start Date: 1 January 2010

Completion Date: 31 December 2012

Vessel Use: None

Overall Objectives:

1. To conduct assessments of rock lobster (*Jasus edwardsii*) stocks including estimation of biomass and sustainable yields.

Specific Objectives (to 31 December 2010):

1. To collect length frequency and other biological data at sea from the catch of the commercial fishery through logbook and catch sampling programmes.
2. To conduct tagging projects to measure the growth rate of lobsters for use in a length-based population model.
3. To update the standardised CPUE analysis from all lobster QMAs and report on the operation of current decision rules.
4. To estimate biomass and sustainable yields for rock lobster stocks.
5. To evaluate new management procedures for rock lobster fisheries.
6. To review future CPUE data requirements.
7. To test the feasibility of alternative methods of monitoring rock lobster abundance.

Note:

This project will run for 3 years from 1 Jan 2010 with an annual review of the objectives at the start of each year.

Reporting Requirements:

Research Reporting

Objectives 1 to 7 (to 31 May 2011)

1. To present the results to meetings of the Rock Lobster Fishery Assessment Working Groups in September 2010 in Wellington. Presentations to more than one meeting may be required in Wellington.
2. To submit to the Chief Scientist MFish a draft Working Group Report as specified in Research Reporting form 8 by 31 October 2010.

3. To present the results to the Fishery Assessment Plenary in November 2010 if required.
4. To submit to the Chief Scientist MFish a Final Research Report as specified in Research Reporting form 5 or a draft Fishery Assessment Research Document as specified in Research Reporting form 7 by 31 May 2011.

Project Update Reports

No Project Update Reporting is required for this project.

Work In Progress Reports

Monthly Work In Progress Reporting is required for this project in accordance with the Conducting Research with the Ministry document.

Data Reporting

To submit any data generated, collected or modified during the course of this project to the Research Data Manager, MFish by 31 December 2012.

Rationale:

General

The red rock lobster, *J. edwardsii* supports the most valuable inshore fishery in New Zealand, with current total TACCs of 2 686 t. Rock lobsters support an important recreational fishery for divers and potters. They are also extremely important for traditional and customary users.

This assessment project has been developed to provide the research information necessary for assessment and management of the fishery. Ensuring the continuing sustainability and optimum use of this fishery is a major management goal.

The assessment model for rock lobsters has been extensively improved in recent years to use all the available data in the model and to consider uncertainty in the model predictions. The latest independent review in 2007 supported the revisions to the length-based model for stock assessments of rock lobster. The model is subject to ongoing improvements and minor changes to suit the stocks being assessed at any time.

CPUE is used as the main indicator of relative stock abundance within rock lobster fisheries. For some time CPUE has been standardised with a general linear modelling approach that tries to remove the effects of season and statistical area from the estimated annual indices. Stock assessments and management procedures (such as the CRA 8 Decision Rule) rely on the standardised CPUE indices. The other main inputs to the assessments are the length frequency distributions of the catch measured at-sea within the Catch Sampling and logbook programmes.

Objective 1

In each fishery the length frequency and sex of the rock lobster catch is collected at sea by fishers completing logbooks or by more intensive catch sampling programmes where fewer days are sampled but the number of samples measured per day is much greater. The number of additional days catch sampling required in each area will be determined from the results from previous years.

Objective 2

Tag and recapture studies have been carried out in recent years to determine the current growth rate of rock lobsters in many areas. Tag recaptures from previous studies will be combined with new tag recoveries as inputs to the assessment model. These results allow the growth rates to be determined for each of the areas within the model.

Objective 3

Standardised CPUE indices for each year are used as indices of abundance in the rock lobster assessment models for each sub-stock. These indices will be determined for each of the 3 major stocks (NSN, NSC and NSS) for the purpose of the decision rules but also for each QMA to allow smaller sub-stocks to be assessed separately if required.

Objective 4

Stock assessments will include new catch information, new growth data from tagging studies, length frequency data from the commercial fishery in several areas and updated CPUE indices from all commercial fisheries. The continuation of data collection in all these areas is important to further update the assessments.

The assessment depends on commercial catch data, which are of good quality, and commercial CPUE data, which are of moderately good quality. It also depends heavily on length frequency data and detailed biological data, which only have good coverage in a few areas. Recently the length-based model has been extended to all areas and further development of the model is expected. The Rock Lobster Fishery Assessment Working Group will decide which stocks will be assessed in each year.

Objective 5

Decision rules have been used in the main rock lobster stocks since 1993 as a basis for annual management decisions. The focus of the rules has been to ensure that stocks rebuild within a predetermined timeframe to biomass levels that can support MSY.

Objective 6

Current standardisation of rock lobster CPUE is limited by the variables available for analysis. Fine scale information on pot type, depth and area fished may improve the explanatory power of the models used and improve the use of CPUE as indices of abundance. Catch rates from different pot types could be explored using logbook and observer data. The effect of vessels and environmental variables (e.g. temperature) could also be examined for this subset of data. If any additional factors are found to strongly influence CPUE data, these should be collected in future data capture to allow the effects to be standardised.

Objective 7

CPUE is currently used as the index of abundance in assessment models of rock lobster stocks. However, high-grading and holding of lobsters in pots are both practices which

may reduce the reliability of CPUE data. If the quality of information from the fishery is not adequate to allow the continued use of CPUE data other methods of monitoring abundance must be considered.

Fishery independent surveys using traps are routinely used in many other rock lobster fisheries to monitor abundance. This objective is to test the feasibility of such surveys in New Zealand or alternatively to design fishery-based surveys that may replace the CPUE. Completion of such a survey is not required.

Weighting

Weightings indicate the relative importance of the each of the objectives. The weightings for the objectives in this project are (in order): 0.15, 0.1, 0.2, 0.2, 0.15, 0.1 and 0.1