



NIWA

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**Estimation of inshore fish abundance along the
east coast of the South Island from Kaikoura to
Shag Point using trawl surveys**

**Final Research Report for
Ministry of Fisheries Research Project INT9702
Objectives 1 and 2**

National Institute of Water and Atmospheric Research

August 1998

Final Research Report

1. **Date:** 31 July, 1998
2. **Contractor:** NIWA
3. **Project Title:** Estimation of inshore fish abundance along the east coast of the South Island from Kaikoura to Shag Point using trawl surveys.
4. **Project Code:** INT9702
5. **Project Leader:** Rosie Hurst
6. **Duration of Project:**
 - Start Date: 1 October 1997
 - Completion date: 31 July 1998

7. **Executive Summary:**

The trawl survey was successfully completed in December 1997-Januray 1998 and the data have been checked and loaded onto the *trawl* database. Preliminary results were presented to Inshore Working Groups 1 & 2 in February 1998.

A NIWA Technical Report has been published (see the attached). It contains biomass estimates for the 20 most abundant species and other commercially important species for which more than 150 kg were caught. Catch rates, distribution, and scaled length frequencies for the major commercial species have been charted. Length weight relationships for the target species, rough skate, smooth skate, rig, barracouta, and dark ghost shark have been calculated from the data.

Target coefficients of variation were achieved on all four target species, elephantfish, red gurnard, giant stargazer, and juvenile red cod < 41 cm total length. Two important issues were identified which may affect interpretation and use of the results in a relative time series. Firstly, the catch rates and biomass estimates of most species were lower than in the 1996–97 survey, and for two of the target species, red gurnard and giant stargazer, the difference was significant. Secondly, the distribution of some species was markedly different from the 1996–97 survey which has implications for survey design in the future, particularly for elephantfish.

These changes in biomass and distribution are possibly related to ocean climate conditions at the time of the surveys.

Length frequency results from the two surveys suggest that it may be possible to develop recruitment indices for the target species as well as barracouta, lemon sole, New Zealand sole, sand flounder, school shark, spiny dogfish, tarakihi and perhaps ling. Ageing of otoliths collected on the surveys would be useful to establish age frequency time series for key species and determine if the surveys are achieving adequate coefficients of variation on specific age classes.

8. Objectives:

Programme Objective:

1. To determine the relative abundance and distribution of inshore finfish species abundance along the east coast of the South Island.

Objectives for 1997/98:

1. To determine the relative abundance and distribution primarily of elephantfish, red gurnard, giant stargazer, juvenile red cod (under 41 cm), and juvenile rig along the east coast of the South Island by carrying out a trawl survey. The target coefficients of variation (*c.v.s*) of the biomass estimates for these species are as follows: elephantfish, 30–35%; red gurnard, 25–30%; giant stargazer, 15–20%; juvenile red cod < 41 cm total length, 30–35%.

Survey completed. Relative abundance and distribution determined. Biomass estimates and *c.v.s* for the target species were: elephantfish, 404 t and 18.2%; red gurnard, 317 t and 16.2%; juvenile red cod < 41 cm, 4 426 t and 24.3%; and stargazer 543 t and 11.4%.

Voyage programme and Voyage Report completed and distributed. Reports to Inshore Working Groups 1 & 2 presented. Technical Report published.

2. To collect the data and to determine the length frequency, length-weight relationship, and reproductive condition of elephantfish, red gurnard, stargazer and red cod caught on the trawl survey.

Data collected during the trawl survey. Length frequencies, length-weight relationships, and reproductive condition determined from the data. Reports to Inshore Working Groups 1 & 2 presented. Technical Report published.

9. Methods:

See the attached Technical Report.

10. Results:

See the attached Technical Report.

11. Conclusions:

See the Executive Summary of this report and the Discussion section of the Technical Report.

12. Publications:

Technical Report attached.

13. Data Storage:

Data from the survey is stored on the Ministry of Fisheries *trawl* database.

