

EEL FISHERIES

Code	Title
EEL2008/01	Recruitment of freshwater eels

Project: Recruitment of freshwater eels

Project Code: EEL2008/01

Start Date: 1 October 2008

Completion Date: 30 September 2012

Vessel Use: NA

Overall Objectives:

1. To monitor the recruitment of juvenile eels.

Specific Objectives:

1. To contribute to a times series of data to monitor the relative recruitment of shortfin and longfin eels by co-ordinating to specific standards the collection of data on abundance, timing of migration and species composition of elver runs at four locations: Karapiro, Matahina, Waitaki and Arnold for the elver migrations 2008/2009, 2009/2010, 2010/2011 and 2011/2012.
2. To investigate the correlation between elver movement and environmental factors such as water temperature and flow.

Note: This project is a continuation of a current project *EEL2006/01 - Recruitment of juvenile eels*. This is a four year project covering the elver runs in the summer of 2008/09, 2009/2010, 2010/2011 and 2011/2012.

Reporting Requirements

Research Reporting:

Objectives 1 and 2

1. To submit to MFish, Research Progress Reports as specified in Form 4 by 1 June 2009, 1 June 2010, 1 June 2011, 1 June 2012 for the elver migrations 2008/09, 2009/2010, 2010/2011 and 2011/2012 .
2. To present the reports detailed in 1 above to meetings of the Eel Working Group in Hamilton and Christchurch in August/September 2009, 2010, 2011 and 2012.
3. To submit to MFish a Final Research Report as specified in Form 5 or a draft Fishery Assessment Report as specified in Form 7 by 30 September 2012.

Rationale:

General

The commercial eel fishery is a moderate volume fishery of around 750 t per year spread throughout the North and South Islands, and the Chatham Islands. The fishery targets both species of eel found throughout New Zealand, the shortfin *Anguilla australis* and the longfin *A. dieffenbachii*. The South Island fishery was introduced into the QMS in October 2000, the Chatham Island fishery in October 2003, and the North Island fishery from 1 October 2004.

There is very limited stock assessment information available for eels, and it is not known if recent catch levels are sustainable. The stock assessment of eels presents particular problems because of the biology of the species. As adults, eels undertake a long homing migration to their oceanic spawning grounds and die after spawning. The location of the spawning grounds is not known, but are likely to be in the south-west Pacific. Juvenile eels migrate back to freshwater and appear to distribute randomly into freshwater. After a period of residence in the lower reaches, juvenile eels known as elvers undertake an upstream migration to disperse throughout the catchment. Because of their biology, all eels are harvested before spawning. The relationship between the escapement of adult eels to spawn and subsequent recruitment has not been determined.

In the Northern Hemisphere the eel fisheries are based on the European eel *Anguilla anguilla*, the Japanese eel *A. japonica* and the American eel *A. rostrata*. Data from glass eel fisheries and elver migration data show a steady decline in recruitment from almost all data sets over the past 20 years. The decline in recruitment for the European eel is now equal to a period equivalent to the average life cycle.

For New Zealand there are no data sets to establish any trends in recruitment. Research has been conducted over the past six years (EEL2000/01, EEL2002/01 and EEL2004/01) that is establishing a times series of data on the relative abundance of elvers at selected locations.

The monitoring of elver runs and hydro dams and other locations where the upstream migration is blocked provides a cost effective means of establishing a longterm data series on the relative abundance. Provided data are collected in a consistent manner each year, the data can be used to determine overall trends in recruitment. The use of existing elver transfer programmes undertaken under special permits issued by MFish provide the most cost effective means of using existing data sources to provide a time series on recruitment.

The Medium Term Eel Research plan proposes that research on recruitment to establish a time series of relative abundance should be ongoing. While the recruitment index will not be used for any predictive modelling of recruitment into the eel fishery, a relative abundance index will provide critical information on recruitment, which will indicate over time the relative status of each eel stock. A major component of any decline in recruitment would be a decline in spawning escapement. This would indicate that management action would be required to maximize spawner escapement.

Objective 1

This objective is designed to extend the results from EEL2006/01 to establish a long-term data series on the relative abundance of elvers at selected locations. The time series of data on relative elver abundance at selected sites began in 1995. This objective will continue the time series for a further four years, 2008/2009, 2009/2010, 2010/2011 and 2011/2012. The research provider will not be required to undertake any collection of elvers. The provider will work with organizations/individuals undertaking elver capture and transfer activities to monitor these activities ensure that the required data is collected in a consistent manner (weight and numbers of elvers, effort, timing of samples, species composition).

This will include visiting sites, sampling caught elvers to check on species composition and estimates of the number of elvers.

Objective 2

This objective would investigate the relationship between elver movement and environmental variables such as water temperature and water flow. For example water temperature appears to play a significant role the timing of elver runs. Changes in the relative abundance of elvers might also reflect cyclical changes in marine conditions affecting the abundance of glass eels, such as the SOI. This objective would investigate these relationships.

Weighting of Objectives:

Weightings indicate the relative importance of each of the objectives. The weightings for the objectives in this project are (in order): 0.7, 0.3.