

## **High Migratory Species**

<b>Code</b>	<b>Title</b>
<b>ALB2009/01</b>	Stock monitoring of albacore
<b>HMS2009/01</b>	Data reports for New Zealand HMS fisheries for international obligations including sharks and full gear and observer descriptions
<b>HMS2009/02</b>	Commercial catch sampling programme for highly migratory species
<b>STM2009/01</b>	Multi-year stock monitoring of striped marlin including logbook programme implementation
<b>STM2009/02</b>	Characterisation of striped marlin fisheries
<b>STN2009/01</b>	Catch-at-age of Southern bluefin tuna
<b>TAG2009/01</b>	Management of the gamefish tag recapture programme

**Project:** Stock monitoring of albacore

**Project Code:** ALB2009/01

**Start Date:** 1 October 2009

**Completion Date:** 30 September 2012

**Vessel Use:** None

**Overall Objectives:**

1. To determine the length composition of the commercial catch of albacore (*Thunnus alalunga*) in New Zealand fisheries waters.
2. To support the stock assessment of the wider South Pacific albacore stock.

**Specific Objectives:**

1. To characterise the fishery for albacore (*Thunnus alalunga*) in New Zealand fisheries waters.
2. To conduct representative sampling to determine the length composition, sex and maturity state and length-weight relationships of albacore tuna during the 2009/2010 fishing year from samples collected in fish sheds. The target coefficient of variation (CV) for the length composition is 20 % (mean weighted CV across all length classes).
3. To conduct representative sampling to determine the length composition and length-weight relationships of albacore tuna during the 2010/2011 fishing year from samples collected in fish sheds. The target coefficient of variation (CV) for the length composition is 20 % (mean weighted CV across all length classes).
4. To conduct sampling in fish sheds and determine the length composition and length-weight relationships of albacore tuna during the 2011/2012 fishing year from samples collected in fish sheds. The target coefficient of variation (CV) for the length composition is 20 % (mean weighted CV across all length classes).

**Note:**

This is a multi-year project and the second and third years of monitoring will be reviewed when Stock Strategies or Fisheries Plans that include albacore are developed.

As the season for albacore is generally finished by May, completion of this project by the end of the fishing year is achievable.

Potential research providers should note that other work is planned under the AWEG that intends to assess the impacts of this fishery and if cost savings can be made by linking sampling in both they should be highlighted.

## **Reporting Requirements:**

### **Research Reporting**

#### Objectives 1 to 4

1. To present the results of Objective 1 to the HMS Working Group including a work plan and sampling design prior to commencing the remaining objectives.
2. 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 1 September 2012.
3. To present the report in 2 above to meetings of the HMS Fishery Assessment Working Group in November 2012 in Auckland or Wellington. Presentations to more than one meeting may be required.
4. To submit to the Chief Scientist, MFish a draft revised Working Group Report as specified in Fishery Assessment Document form 2 for albacore by 1 September 2012.

### **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 October 2012.

### **Rationale:**

#### *General*

Albacore tuna caught in New Zealand fisheries waters are part of a single South Pacific Ocean stock that ranges from the equator to about 45° S. Recent annual catches from the South Pacific stock have ranged between 25,000 and 40,000 t; about 75 % of which is caught by longline vessels with the rest taken mainly by trolling.

The New Zealand fishery is predominantly a summer fishery in which over 95% of landings occur before May. Trolling is the main method used by domestic fishers (about 80%) followed by longlining (20%). 2092 t of albacore were landed in 2007. The troll fishery is an important component of the annual fishing plan of several inshore fishers targeting a wide range of species with different gear types throughout

the year. The albacore catch is an important and stable component of the tuna longline fishery.

Although the regional stock assessment model results are uncertain, exploitation rates are considered moderate and current catches are likely to be sustainable in the medium term. Assessments conducted with limited data on stocks such as South Pacific albacore that, apparently, have been subject to low exploitation rates provide little information on the biomass of the stock. The 2003 assessment gave similar results to the 2002 assessment, with a low impact of fishing on biomass, and indicated that the current biomass is at about 60% of unfished levels. Current catch levels from the South Pacific albacore stock appear likely to maintain the albacore stock at a size capable of supporting an MSY.

Albacore are currently outside the QMS. The Ministry of Fisheries' is attempting to monitor the status of albacore stocks in relation to the  $B_{MSY}$  as estimated in a regional context.

A stock assessment of albacore specifically for New Zealand fisheries waters is not currently possible as the proportion of the South Pacific stock that migrates through and/or resides in New Zealand fisheries waters is unknown.

Changes to the population structure, such as a pronounced reduction in catches of larger fish, or the absence of small fish are the types of signals that might indicate that the albacore stock is under pressure. A time-series of annual size structures will provide a means by which the Ministry can monitor the status of the albacore stock; and, possibly in the future, monitor the effects of management changes. In the absence of a formal stock assessment for New Zealand fisheries waters, monitoring is based on an annual catch sampling programme.

Size structure of the New Zealand albacore catch was considered to be a critical input to the regional size structured stock assessment at the most recent Standing Committee on Tuna and Billfish meeting when it reviewed the albacore stock status. There is a risk that if this particular research project is not undertaken, the current South Pacific albacore stock assessment will be less reliable.

This research is necessary because:

- South Pacific stock status is uncertain and the impact of large catches of juvenile and sub-adult fish in New Zealand waters on the stock are unknown;
- Annual catch sampling is currently our only monitoring tool for this stock;
- The project has been identified as integral to the albacore component of the New Zealand Pelagic Fisheries Medium Term Research Plan;
- A time series of data are required for stock assessment purposes; and
- The data are an important input to the regional stock assessment.

Within this context, this research project is considered a high priority.

#### *Objective 1*

Results of the characterisation will be used to determine which fisheries need to be sampled and the spatio-temporal sampling effort required in order to obtain representative samples. The characterisation will also provide valuable input for the fisheries plan that is presently being developed.

#### *Objectives 2, 3 and 4*

Under these objectives, the research provider will sample to determination of the representative length composition and length-weight relationships of albacore tuna during the 2009/2010, 2010/11, 2011/12 fishing years. Sampling should occur throughout the albacore troll season. The target coefficient of variation (CV) for the length composition is 20% (mean weighted CV across all length classes).

Under this objective, the research provider will sample to collect length and gonad samples from albacore tuna during the 2009/10 fishing year will occur. Sampling will occur in fish sheds at Onehunga, Greymouth, and New Plymouth throughout the albacore troll season. All fish should be measured for length with a sub-sample measured for weight. These will need to be catalogued into the Ministry of Fisheries archive, and the gonads and associated data then forwarded to the Oceanic Fisheries Programme of the SPC for a regional project.

All fish should be measured for length with a sub-sample measured for weight.

An additional requirement is to collect 50 pairs of otoliths from albacore of 50 cm fork length or less in each year. These will need to be catalogued into the Ministry of Fisheries archive, and then forwarded to the Oceanic Fisheries Programme of the SPC for a regional project.

Additional information on sampling methodologies for this project can be obtained from the outputs of ALB2005/01.

#### *Weighting of Objectives:*

Weightings indicate the relative importance of each of the objectives. The weightings for the objectives in this project are (in order): 0.1, 0.3, 0.3 and 0.3.

**Project:** Data reports for New Zealand HMS fisheries for international obligations including sharks and full gear and observer descriptions

**Project Code:** HMS2009/01

**Start Date:** 1 January 2009

**Completion Date:** 30 September 2011

**Vessel Use:** None

**Overall Objectives:**

To characterise the New Zealand tuna fisheries, including catches and discards of associated and dependent species for reporting to International organizations.

**Specific Objectives:**

1. To characterise the New Zealand tuna fisheries for albacore (*Thunnus alalunga*), bigeye tuna (*Thunnus obesus*), Pacific bluefin tuna (*Thunnus orientalis*), skipjack tuna (*Katsuwonus pelamis*), southern bluefin tuna (*Thunnus maccoyii*), yellowfin tuna (*Thunnus albacares*), and swordfish (*Xiphias gladius*) in the New Zealand fisheries waters and adjacent areas for the 2009/10 fishing year and 2009 calendar year.
2. To estimate the catches, catch rates, and discards of non-target fish, HMS sharks, seabirds and sea turtles in tuna and swordfish longline fisheries data from the Observer Programme and commercial fishing returns for the 2009/10 fishing year and 2009 calendar year.
3. To characterise the New Zealand tuna fisheries for albacore (*T. alalunga*), bigeye tuna (*T. obesus*), Pacific bluefin tuna (*T. orientalis*), skipjack tuna (*K. pelamis*), southern bluefin tuna (*T. maccoyii*), yellowfin tuna (*T. albacares*), and swordfish (*X. gladius*) in the New Zealand fisheries waters and adjacent areas for the 2010/11 fishing year and 2010 calendar year.
4. To estimate the catches, catch rates, and discards of non-target fish HMS sharks, seabirds and sea turtles in tuna and swordfish longline fisheries data from the Observer Programme and commercial fishing returns for the 2010/11 fishing year and 2010 calendar year.

**Note:**

The outputs of this project will include reports for various international fisheries organisations and the data analysed under this project will be that submitted by New Zealand to WCPFC and CCSBT.

## **Reporting Requirements:**

### **Research Reporting**

#### Objectives 1 to 4

1. To update the National Fishery Reports for the Western and Central Pacific Fisheries Commission and Commission for the Conservation of Southern Bluefin Tuna in 2010 and 2011.
2. 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 1 September 2011.
3. To present the report in 2 above to meetings of the HMS Fishery Assessment Working Group in November 2011 in Auckland or Wellington. Presentations to more than one meeting may be required.
4. To submit to the Chief Scientist, MFish a draft revised Working Group Report as specified in Fishery Assessment Document form 2 for all species concerned by 1 September 2012.

### **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 October 2012.

### **Rationale:**

#### *General*

New Zealand has a range of tuna fisheries both within New Zealand fishery waters (NZFW) and outside. Many of the target and fish bycatch species taken in these fisheries are highly migratory species (HMS) which are managed under Regional Fisheries Management Organizations (RFMOs). Currently the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) is responsible for managing southern bluefin tuna (STN) and has an interest in ecologically related species taken in STN fisheries. The Western and Central Pacific Fisheries Commission is responsible for managing stocks of HMS in the western and central Pacific Ocean of which New Zealand's fisheries waters are a part. These two Commissions have

memberships that include both coastal states and distant water fishing nations which fish for these stocks. As a member of CCSBT and WCPFC, New Zealand has many obligations, including the provision of data and submission of annual reports describing the fisheries and research activities.

Species covered by these Commission's are some of the most valuable fish species taken in New Zealand fisheries (e.g. southern bluefin tuna and swordfish). Many of these species were brought into the Quota Management System (QMS) in 2004, and currently skipjack and albacore tuna are the only major components of New Zealand tuna fisheries (target or bycatch species) outside the QMS. Those introduced to the QMS were added to the Third Schedule of the Fisheries Act (1996) to reflect their HMS status.

Over the past two years approximately 30,000 t of tuna and swordfish have been taken with about half taken by New Zealand flagged vessels fishing on the high seas or in the EEZs of other countries under access agreements. Most of this catch is skipjack tuna with (20,000t) with albacore and yellowfin making up most of the remainder. Whilst the longline catch is quite low, these catches are often of high value species.

The status of these stocks are determined in a regional context. Based on assessments for the western and central Pacific Ocean, exploitation rates for albacore and skipjack are considered low with current catches likely to be sustainable in the medium term. Bigeye and yellowfin tuna are either fully exploited, or nearing full exploitation, which current rates of fishing mortality above that which will produce the maximum sustainable yield.

The International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC) is currently developing a detailed stock assessment for Pacific bluefin. At this stage the assessment is preliminary and thus uncertain. It is not known if current catches are sustainable or will help the stock move toward the level that will support the MSY. There is concern about the high fishing mortality on juvenile fish.

Southern bluefin tuna are assessed as a single Pacific Ocean/Indian Ocean/Tasman Sea stock, with the New Zealand catch accounting for approximately 2.5% of the global total. Although the results of recent stock assessments are uncertain, exploitation rates are considered high and parental stock is likely to be less than 10% of the virgin stock size.

A first regional stock assessment for swordfish is complete (SWO2003/01 and SWO2004/01, SWO2007/01) and has provided some advice on the sustainability of catches of this important component of New Zealand's longline fishery.

Tuna comprise a significant fishery for highly migratory species in New Zealand fisheries waters, and by New Zealand fishers on the high seas. Understanding these fisheries is important for both domestic management and the development of New Zealand's position in regional fisheries management organisations.

New Zealand is required to submit data to both WCPFC and CCSBT and produce National Fishery Reports (NFR) summarising these data. The outputs of this project will be major inputs to NFRs to the WCPFC and CCSBT Scientific Committees and

the CCSBT Ecologically Related Species Working Group. It is also likely that the successful tenderer will be required to provide input to other papers that could be required for these fora.

This research is necessary because:

- These species support valuable commercial fisheries;
- New Zealand has international obligations to report annually on our tuna fisheries; and
- The project has been identified as integral to the tuna and billfish components of the New Zealand Pelagic Fisheries Medium Term Research Plan.

Within this context, this research project is considered a **high** priority.

### *Objectives 1 and 3*

Analyses under these objectives will focus on the describing the various tuna fisheries operating within New Zealand fisheries waters and on the high seas and in the EEZ of other countries by New Zealand flagged vessels. This will include analysis of all current data to provide detailed gear characteristics for all fleets, and should include logbook and observer data analysis. Inputs and report updates will be required for the National Fishery Reports for the WCPFC and CCSBT Scientific Committees. Previous National Fishery Reports should be consulted for examples of the types of analyses to be included, but it is noted that the requirements could differ depending on specific requests from the Commissions. Note that in 2008 the Scientific Committee of the Western and Central Pacific Fisheries Commission agreed on a new format for the National Fishery Report. Research providers should contact Stephen Brouwer ([Stephen.brouwer@fish.govt.nz](mailto:Stephen.brouwer@fish.govt.nz)) for details.

Outputs will include:

- analyses of the spatial and temporal distribution of effort and catches of key tuna and billfish species;
- developing plots of the number of vessels per year in each fishery for the history of the New Zealand fleets;
- unstandardised CPUE data for important species (e.g. southern bluefin tuna, bigeye tuna, and swordfish);
- analysis of size of weight composition data collected from observer and other catch monitoring programmes;
- estimates of coverage of size and weight data (e.g. proportion of total catch covered by sampling data); and
- estimates of observer coverage in terms of effort and catch for the purse seine and longline fishery.

Available information on the destination of New Zealand's tuna exports and estimates of recreational catches of HMS species should be collated.

### *Objectives 2 and 4*

Analyses under these objectives will focus on non-target fish, HMS sharks, seabirds and sea turtles bycatch taken in tuna and swordfish fisheries. This will include analysis of all current data to provide detailed gear characteristics for all fleets, and should include logbook and observer data analysis. Inputs and report updates will be required for the NFR's for the WCPFC Scientific Committee and the CCSBT Ecologically Related Species Working Group.

Outputs will include:

- estimates of catches and discards of commonly caught (e.g. top ten) bycatch species in tuna and swordfish longline fisheries based on ratio estimators or other approaches;
- summaries of the life status of discards in the longline fishery;
- unstandardised CPUE data for bycatch species with reliable catch data; and
- summaries of any information on bycatch from the skipjack purse seine fishery.

### *Weighting of Objectives:*

Weightings indicate the relative importance of each of the objectives. The weightings for the objectives in this project are (in order): 0.25, 0.25, 0.25 and 0.25.

**Project:** Commercial catch sampling programme for highly migratory fish species

**Project Code:** HMS2009/02

**Start Date:** 01 August 2009

**Completion Date:** 31 March 2013

**Vessel Use:** None

**Overall Objectives:**

1. To collect biological information describing highly migratory fish species from shore-based fish processing and handling facilities.

**Specific Objectives:**

1. To continue the catch sampling programme for swordfish, southern bluefin tuna, bigeye tuna, Pacific bluefin tuna, and yellowfin for the 2009/10 fishing year.
2. To continue the catch sampling programme for swordfish, southern bluefin tuna, bigeye tuna, Pacific bluefin tuna, and yellowfin for the 2010/11 fishing year.
3. To continue the catch sampling programme for swordfish, southern bluefin tuna, bigeye tuna, Pacific bluefin tuna, and yellowfin for the 2011/12 fishing year.

Note: This project represents a continuation of work undertaken in TUN2005/02 and TUN2006/01, TUN2007/02. This project will not summarise the data for input into stock assessments, rather separate projects will be set up when necessary.

There is currently a catch tracking scheme under development within the CCSBT. If this scheme is progressed within the life span of this project, the shed sampling of southern bluefin tuna may need to be reviewed by MFish as it may not be necessary.

**Reporting Requirements:**

**Research Reporting**

Objectives 1 to 4

1. To update the National Fishery Reports for the Western and Central Pacific Fisheries Commission and Commission for the Conservation of Southern Bluefin Tuna in 2010 and 2011.
2. 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 1 September 2013.

3. To present the report in 2 above to meetings of the HMS Fishery Assessment Working Group in November 2012 in Auckland or Wellington. Presentations to more than one meeting may be required.
4. To submit to the Chief Scientist, MFish a draft revised Working Group Report as specified in Fishery Assessment Document form 2 for all species concerned by 1 September 2013.

### **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 October 2012.

### **Rationale:**

#### *General*

New Zealand has a range of tuna fisheries both within New Zealand fishery waters (NZFW) and outside. Many of the target and fish bycatch species taken in these fisheries are highly migratory species (HMS) which are managed under Regional Fisheries Management Organizations (RFMOs). Currently the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) is responsible for managing southern bluefin tuna (STN) and has an interest in ecologically related species taken in STN fisheries. The newly established Western and Central Pacific Fisheries Commission is responsible for managing stocks of HMS in the western and central Pacific Ocean of which New Zealand's fisheries waters are a part.

These two Commissions have memberships that include both coastal states and distant water fishing nations which fish for these stocks. As a member of CCSBT and WCPFC, New Zealand has many obligations, including the provision of data and submission of annual reports describing the fisheries and research activities.

Species covered by these Commission's are some of the most valuable fish species taken in New Zealand fisheries (e.g. southern bluefin tuna and swordfish). Many of these species were bought into the Quota Management System (QMS) in 2004, and currently skipjack and albacore tuna are the only major components of New Zealand tuna fisheries (target or bycatch species) outside the QMS. Those introduced to the QMS were added to the Third Schedule of the Fisheries Act (1996) to reflect their HMS status.

Over the past two years over 26,000 t of tuna and swordfish have been taken with about half taken by New Zealand flagged vessels fishing on the high seas or in the

EEZs of other countries under access agreements. Most of this catch is skipjack tuna with (20,000t) with albacore and yellowfin making up most of the remainder. Whilst the longline catch is quite low, these catches are often of high value species.

Due to their HMS nature, assessments for these stocks are done on a regional basis with New Zealand responsible of monitoring its fisheries and providing these data to the respective Commission. In addition to their benefits for assessments, these data are also useful for monitoring the New Zealand 'component' of these stocks, particularly as New Zealand is at the extremes of the range for most HMS.

Historically most biological information about HMS was collected by observers at sea in the tuna longline fishery. The low quantity of data collected annually due to low levels of observer coverage often means waiting several years to answer key questions and greatly reduces our ability to monitor the components of the stock that migrate through or reside in New Zealand fisheries waters. In response to this, a programme has been set up to take advantage of the large size and high individual value of these HMS species. For many high value species it is possible to obtain individual size/weight data on a high proportion of the catch through records kept by fish processors. This programme was developed under TUN2005/02 and has continued under TUN2006/01, and TUN2007/02. The current project will continue this time series.

This research is necessary because:

- these species support valuable commercial fisheries;
- many of these species have recently been introduced into the QMS and current levels of observer coverage do not provide sufficient information for the monitoring of these stocks;
- catch sampling for these species will provide critical data for future stock assessments and a possible means for monitoring the stocks in the absence of a stock assessment;
- the project has been identified as integral to the tuna, billfish, and pelagic shark components of the New Zealand Pelagic Fisheries Medium Term Research Plan; and
- if this project does not go ahead, our ability to monitor the landings of highly migratory species will be greatly reduced, future stock assessments will be less reliable.

Within this context, this research project is considered a **high** priority.

### *Objectives 1, 2 and 3*

The activities required under these objectives are described in the three steps below. The number of fish processors sampled should allow for individual weight data to be collected 60-80% of the total catch for each species.

### Step 1

Collect individual processed weight data from fish processors that include:

- Vessel name; registration
- Date of landing
- Processed weight; grade

This data represents the “sampled” landings for swordfish and tuna. Collate and error check this data into a centralised database administered by NIWA on the Ministry’s behalf.

### Step 2

Extract relevant catch and effort data (TLCER) for all landings “sampled” based on the vessel name and date of landing. The information extracted will be sufficient to allow temporal and spatial stratification of the processed weight data as may be appropriate, e.g., by 5°×5° latitude/longitude squares, and by month for STN. Stratification for other tunas will most likely be for all the NZ EEZ and by quarter.

### Step 3

Apply relevant conversion factors from individual processed weights to whole fish length (where necessary) to obtain landing-specific length compositions. Extract catch and effort data (TLCER) for all landings of swordfish and tunas required for raising sample length frequencies to total numbers at length in each stratum.

### *Weighting of Objectives:*

Weightings indicate the relative importance of each of the objectives. The weightings for the objectives in this project are (in order): 0.33, 0.33 and 0.33.

**Project:** Multi-year stock monitoring of striped marlin including logbook programme implementation

**Project Code:** STM2009/01

**Start Date:** 01 July 2009

**Completion Date:** 30 November 2011

**Vessel Use:** None

**Overall Objectives:**

1. To monitor recreational fisheries for billfish within New Zealand fisheries waters.

**Specific Objectives:**

1. To update time series of catches, landings, and size composition data collected from recreational sources for the 2009/10 and 2010/11 fishing years.
2. To implement a logbook programme for striped marlin for the recreational fishery for the 2009/10 and 2010/11 fishing years

**Note:**

This is a project is a continuation of the time series of striped marlin monitoring projects extended to include the small recreational catches of other billfish taken in New Zealand fisheries waters.

The outputs of this project will possibly include reports for various international fisheries organisations; however, these will be contracted separately as required.

If the charter vessel reporting scheme comes on board we may need to revisit some of these data as they may be reported elsewhere and the skippers may be reluctant to duplicate reporting.

**Reporting Requirements:**

**Research Reporting**

Objectives 1 to 2

1. To update the National Fishery Report for the Western and Central Pacific Fisheries Commission in 2010 and 2011.
2. 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 1 September 2011.

3. To present the report in 2 above to meetings of the HMS Fishery Assessment Working Group in November 2011 in Auckland or Wellington. Presentations to more than one meeting may be required.
4. To submit to the Chief Scientist, MFish a draft revised Working Group Report as specified in Fishery Assessment Document form 2 for all species concerned by 1 September 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 October 2012.

### **Rationale:**

#### *General*

Striped marlin forms the basis of a significant recreational gamefish fishery in New Zealand. About 1500 striped marlin are caught each year although there are annual fluctuations in catch levels. Typically 65% of the striped marlin that are caught in the recreational fishery are tagged and released. There is also an incidental catch in the pelagic longline fishery; however, commercial fishers are not allowed to retain striped marlin for sale.

As New Zealand fishers encounter some of the largest and likely oldest striped marlin in the Pacific, the abundance of fish found within New Zealand fisheries waters will be sensitive to the status of the stock in addition to environmental factors that may also influence availability. For these reasons monitoring of the components of the stock that migrate through, or reside within, New Zealand fisheries waters will be important input for any future regional stock assessment.

This research project is a continuation of monitoring of striped marlin catches by recreational and commercial fishing. Recreational catch and size composition data are available for the major sports fishing clubs for well over 50 years and catch and effort data are available for the east northland charter fleet for 30 years. The quality of the catch data is very high and has been a critical input to the 2007 regional stock assessment.

The Oceanic Fisheries Programme of the Secretariat of the Pacific Community (OFP-SPC) recently compiled catch estimates for the western and central Pacific Ocean, and the Australian Bureau of Rural Sciences in collaboration with OFP-SPC have recently

developed a stock assessment for the southwest Pacific Ocean. This model had difficulty “predicting” the large fish found in New Zealand, partly due to inadequate data of the movements and habitat preferences of these large individuals. Furthermore, the uncertainty in this preliminary assessment indicates that it is not known if current levels of removals are sustainable.

The stock structure of striped marlin in the Pacific Ocean is not well known, but the focus of current research activities. The two most frequently considered hypotheses are: (1) a single-unit stock in the Pacific, which is supported by the continuous “horseshoe-shaped” distribution of striped marlin; and (2) a two-stock structure, with the stocks separated roughly at the Equator, albeit with some intermixing in the eastern Pacific. Concern has been expressed at the WCPFC science committee 2008 meeting about the decline in the large north Pacific striped marlin fishery.

Striped marlin is not included in the QMS and commercial fishers are not allowed to retain striped marlin for sale. A Fisheries Plan for striped marlin and other HMS species is being developed, and the Ministry of Fisheries is attempting to monitor the status of the striped marlin stock in a regional context.

Monitoring of striped marlin in New Zealand fisheries waters is based on monitoring the catches of striped marlin in the recreational fishery and the levels of bycatch in the commercial longline fisheries targeting tuna.

This research is necessary because:

- striped marlin supports a significant recreational fishery;
- stock status and stock structure of striped marlin is largely unknown, the stock assessment available for this region is highly uncertain;
- as the striped marlin found in New Zealand waters are among the largest encountered in the Pacific, trends in the abundance of this component of the stock could provide important indicators of the status of the stock and provide important information for future regional stock assessments; and
- if this project does not go ahead, future regional stock assessments for striped marlin will be less reliable due to the lack of information on the largest individuals.

Within this context, this research project is considered a **high** priority.

#### *Objective 1*

Future stock assessments for striped marlin will rely heavily on accurate catch statistics. It is important that the various data series are clearly defined. For example, estimates of the numbers and sizes of fish landed may be collected from the various sport-fishing clubs, but these data will be reported separately from estimates of the numbers and estimated sizes of fish released. Size composition information could include both lengths and weights.

This project will not collect commercial estimates of catches as these will be provided from other MFish projects (e.g., TUN2007/01).

This objective is a continuation of the work undertaken under objective 1 of STM2003/01, STM2005/01 and STM2007/01 with the inclusion of catch data on other billfish.

### *Objective 2*

Under this objective the logbook programme implemented under Objective three of project STM2007/01 will be extended for a further two years. The focus will be on collecting high quality catch and effort data for the purpose of deriving CPUE indices for the striped marlin fishery though data on other billfish species (excluding swordfish) will also be collected.

The tenderer is expected to work closely with logbook holders to ensure high quality data and participation rates. Part of this will be providing good feedback to fishers, including data summaries. The tenderer will also ensure that the data is captured and provided to MFish for inclusion in the appropriate data base.

### *Weighting of Objectives:*

Weightings indicate the relative importance of each of the objectives. The weightings for the objectives in this project are (in order): 0.5 and 0.5.

**Project:** Characterisation of striped marlin fisheries

**Project Code:** STM2009/02

**Start Date:** 1 July 2009

**Completion Date:** 30 September 2010

**Vessel Use:** None

**Overall Objectives:**

To characterise the New Zealand fisheries for striped marlin.

**Specific Objectives:**

1. To characterise the fisheries for striped marlin in the New Zealand fisheries waters, the high seas and for New Zealand vessels fishing in other EEZ's.
2. To analyse existing commercial and recreational catch and effort data to the end of 2008/09 fishing year and undertake a CPUE standardisation.
3. To analyse existing observer data on striped marlin catch and catch rates to assess the reliability of commercial reporting.
4. To assess possible gear configuration and operational measures that is employed by commercial fishers to avoid striped marlin catch.

**Reporting Requirements:**

**Research Reporting**

Objectives 1 to 4

1. To update the National Fishery Report for the Western and Central Pacific Fisheries Commission in 2010.
2. 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 1 September 2010.
3. To present the report in 2 above to meetings of the HMS Fishery Assessment Working Group in November 2010 in Auckland or Wellington. Presentations to more than one meeting may be required.
4. To submit to the Chief Scientist, MFish a draft revised Working Group Report as specified in Fishery Assessment Document form 2 for all species concerned by 1 September 2010.

**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 October 2012.

## **Rationale:**

### *General*

Management of the striped marlin and other highly migratory pelagic species throughout the western and central Pacific Ocean (WCPO) is the responsibility of the Western and Central Pacific Fisheries Commission (WCPFC). Under the convention, New Zealand is responsible for ensuring that the fisheries management measures applied within New Zealand fisheries waters are compatible with those of the Commission.

At its third annual meeting (2006) the WCPFC passed a Conservation and Management Measure (CMM) (this is a binding measure that all parties must abide by) relating to conservation and management of striped marlin in the southwest Pacific Ocean (<http://www.wcpfc.org/>). This measure restricts the number of vessels a state can have fishing for striped marlin on the high seas (except in instances when the state has already taken other steps to manage striped marlin, as is the case for New Zealand).

Most of the commercial striped marlin catch in the southwest Pacific is caught in the tuna surface longline fishery, which started in 1952. Since 1980 foreign fishing vessels had to obtain a license to fish in New Zealand's EEZ and were required to provide records of catch and effort. New Zealand domestic vessels commenced fishing with surface longlines in 1989 and the number of vessels and fishing effort expanded rapidly during the 1990s. Very few striped marlin are caught by other commercial methods, although there are occasional reports of striped marlin caught in purse seine nets.

A three-year billfish moratorium was introduced in October 1987 in response to concerns over the decline in availability of striped marlin to recreational fishers. The moratorium prohibited access to the Auckland Fisheries Management Area (AFMA - Tirua Point to Cape Runaway) by foreign licensed and chartered tuna longline vessels between 1 October and 31 May each year. Licence restrictions required that all billfish, including broadbill swordfish, caught in the AFMA be released. In 1990 the moratorium was renewed with some amended conditions.

Regulations prohibited domestic commercial fishing vessels from retaining billfish caught within the AFMA since 1988. In 1991 these regulations were amended to allow the retention of broadbill swordfish and prohibited the retention of marlin species

(striped, blue and black marlin) by commercial fishermen in the entire EEZ of New Zealand. These regulations and government policy changes on the access rights of foreign licensed surface longline vessels have replaced the billfish moratorium. A billfish memorandum of understanding (MOU) between representatives of commercial fishers and recreational interests provided a framework for discussion and agreement on billfish management measures. This MOU was reviewed annually between 1990 and 1997, and was last signed in 1996.

Striped marlin have not been introduced to the QMS. Catch is reported on Catch Effort Landing Returns (CELRs) and Tuna Catch Effort Landing Returns (TCELRs) and recreational catches from New Zealand Big Game Fishing Council records.

This research is necessary because:

- this species contribute to support important recreational fisheries;
- the status of this stock is currently uncertain;
- there is concern about the status of stiped marlin in other WCPFC areas; and the project has been identified as integral to the New Zealand HMS Fisheries Medium Term Research Plan;

Within this context, this research project is considered a **high** priority.

#### *Objective 1*

Results of the characterisation will be used to determine the most appropriate vessels, fisheries and spatio-temporal characteristics of the data to be used for the data grooming procedures prior to CPUE analysis. This should include commercial, recreational and observer data to the end of the 2008/09 fishing year. Where possible, the characterisation should include spatio-temporal assessments of the size data.

#### *Objective 2*

Striped marlin are taken as a target by recreational fishers and bycatch in commercial fisheries. Research providers should also take cognisance of recent progress made in data grooming for CPUE standardization for finfish including methods used to reconcile landings with estimated catch. Potential science providers are referred to the Kendrick and Walker (2004) and Starr et al. (2007) reports for further details. Note that the commercial fleet may currently not land striped marlin and this may effect the CPUE time series for this fishery. The commercial data should be compared to the commercial reporting's data to assess possible underreporting if discarded catch.

#### *Objective 3*

Tuna longline data collected by scientific observers in northern New Zealand is patchy. Results of Objective 1 should be used to investigate factors that could effect catch rate and survivorship of striped marlin. In addition, the research provider would be expected to assess the observer data and compare catch and release rates and state to that reported by the commercial fishery and assess the reliability of the commercial reporting data.

#### *Objective 4*

Under this objective research providers will explore the New Zealand longline fishery data and assess if there are gear configurations or operational measures such as time or set, depth of set or area fished that are employed by commercial longline fishers to reduce striped marlin catch, and if so assess their possible effectiveness.

Kendrick, T.H.; Walker, N. (2004). Characterisation of the GUR 2 red gurnard (*Chelidonichthys kumu*) and associated inshore trawl fisheries, 1989-90 to 2000-01 New Zealand Fisheries Assessment Report 2004/21. 83p.

Starr PJ., Kendrick TH., Lydon GJ. and Bentley N. 2007. Report to the Adaptive Management Fishery Assessment Working Group: Full term review of the GUR 3 Adaptive Management Programme. AMP-WG-07/11v2. (Unpublished manuscript available from the NZ Seafood Industry Council, Wellington).

#### *Weighting of Objectives:*

Weightings indicate the relative importance of each of the objectives. The weightings for the objectives in this project are (in order): 0.1, 0.225, 0.225, 0.225 and 0.225.

**Project:** Catch-at-age of southern bluefin tuna  
**Project Code:** STN2009/01  
**Start Date:** 01 July 2009  
**Completion Date:** 31 May 2012  
**Vessel Use:** None

**Overall Objectives:**

1. To determine the age composition of the commercial catch of Southern bluefin tuna (*Thunnus maccoyii*) in New Zealand fisheries waters.

**Specific Objectives:**

1. To age 250 otoliths per year from southern bluefin tuna collected by scientific observers aboard vessels fishing in New Zealand fisheries waters during the 2008/09 fishing season.
2. To age 250 otoliths from southern bluefin tuna collected by scientific observers aboard vessels fishing in New Zealand fisheries waters during the 2009/10 fishing season.
3. To age 250 otoliths from southern bluefin tuna collected by scientific observers aboard vessels fishing in New Zealand fisheries waters during the 2010/11 fishing season.

**Note:**

This project is a continuation of work started under IFA2004/03, STN2006/01 and STN2007/01 to monitor the ages of southern bluefin taken in the New Zealand fishery.

**Reporting Requirements:**

**Research Reporting**

Objectives 1 to 4

1. 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 1 September 2011.
2. To present the report in 1 above to meetings of the HMS Fishery Assessment Working Group in November 2011 in Auckland or Wellington. Presentations to more than one meeting may be required.

3. To submit to the Chief Scientist, MFish a draft revised Working Group Report as specified in Fishery Assessment Document form 2 for all species concerned by 1 September 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 October 2011.

### **Rationale:**

#### *General*

Southern bluefin tuna are managed by the Commission for the Conservation of Southern bluefin tuna and form a valuable fishery in New Zealand waters taken mainly by domestic and chartered longline vessels.

Given the low current biomass levels for the stock, information on recent year class strength is particularly important. Previously cohort strength has been determined using cohort slicing to convert catch-at-length to catch-at-age, but it has been increasingly realised that it is preferable to use direct age estimation. To this end, a workshop was held in June 2002 to develop protocols for reading and interpreting southern bluefin otoliths.

Sub samples of otoliths collected during the 2000/01 through to 2003/04 have been aged under MFish project IFA2004/03 and STN2006/01 aged samples collected in 2004/05 and 2005/06 to determine catch-at-age for these years, in addition STN2007/01 collected catch-at-age data in 2006/07 and 2007/08. The results of this work were found to be useful within both a local and stock context in terms of providing an indication of recruitment strength. This project will add to the time series for the recent history of the New Zealand fishery.

This research is necessary because:

- Southern bluefin tuna form a valuable target longline fishery; and
- accurate estimation of recent cohort strength is important to assessing the status of the stocks and likely future abundance levels.

Within this context, this research project is considered a **high** priority.

### *Objectives 1, 2 and 3*

Scientific observers aboard New Zealand domestic vessels and foreign vessels chartered to fish in New Zealand waters routinely collect otoliths from Southern bluefin tuna.

To obtain an adequate sample for determination of catch-at-age, Morton and Bravington (2003) concluded that 100-200 per year is sufficient for the Australian surface fishery, 200 for the Japanese longline fishery, and 500 for the Indonesian fishery. IFA2004/03 aged 200 fish per year, and while the patterns in the data were generally consistent across years, it was apparent that an increased number of otoliths would likely reduce the uncertainty in the proportions of younger ages taken in the catch.

Based on this, it is anticipated that 250 otoliths per year will be randomly sampled from the collections for chosen fishing years; however, the final numbers aged may change based on consultation between the MFish, other members of the Scientific Committee for CCSBT, and the successful tenderer. The otoliths will be sectioned and aged, preferably using two blind readings. The report of the “Direct Age Estimation Workshop of the CCSBT” held 11-14 June, 2002, in Queenscliff, Australia should form the basis for the protocols to be employed.

The output from this project will be estimates of age-selected individuals in the format recommended by the 10<sup>th</sup> Scientific Committee, i.e. Year, Month, Fleet, Gear type, Latitude, Longitude, Length, Otolith ID, Age estimate, Sex, Readability, and Comments.

Annual and /or combined age-length keys should also be developed. Images from otoliths aged should also be collected and archived.

#### *Weighting of Objectives:*

Weightings indicate the relative importance of each of the objectives. The weightings for the objectives in this project are (in order): 0.33, 0.33 and 0.33.

**Project:** Management of the gamefish tag recapture programme

**Project Code:** TAG2009/01

**Start Date:** 01 October 2009

**Completion Date:** 30 September 2012

**Vessel Use:** None

**Overall Objectives:**

1. To manage and report the data obtained from the co-operative tag recapture programme for gamefish.

**Specific Objectives:**

1. To collect and key punch tagging and recapture data for gamefish species in the 2009/10 year.
2. To compile an annual summary of the results of the tag recapture programme for 2009/10.
3. To collect and key punch tagging and recapture data for gamefish species in the 2010/11 year.
4. To compile an annual summary of the results of the tag recapture programme for 2010/11.
5. To collect and key punch tagging and recapture data for gamefish species in the 2011/12 year.
6. To compile an annual summary of the results of the tag recapture programme for 2011/12.

Note:

This project continues an extensive time series of work (PEL2000/01, PEL2003/01 and TAG2006/01 are the most recent projects).

This programme will be subject to a review in early 2009. Potential research providers should take note that the objectives of this programme may change pending the outcome of that review. The project will not be tendered until after the review is complete.

The data collected in this programme are to be updated on the MFish *tag* database (managed by NIWA) as regularly as possible and at least annually. Where data are subsequently revised or updated (e.g. the provision of lat/long rather than an earlier

generic position, or the provision of previously missing data) these updates should be entered onto the *tag* database as soon as is practical.

## **Reporting Requirements:**

### **Research Reporting**

#### Objectives 1 to 6

1. 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 1 September 2012.
2. To present the report in 1 above to meetings of the HMS Fishery Assessment Working Group in November 2012 in Auckland or Wellington. Presentations to more than one meeting may be required.
3. To submit to the Chief Scientist, MFish a draft revised Working Group Report as specified in Fishery Assessment Document form 2 for all species concerned by 1 September 2012.

## **Rationale:**

### **General**

Participation in this programme is supported by the New Zealand Big Game Fishing Council (who purchase and distribute tags to recreational fishers). The current process of contracted programme management and annual reporting are also providing good results from the gamefish tagging programme and further promote participation. The annual reports provide stakeholders with an understanding of the fish tagged, and the tag returns annually. The reports and programme data are also in demand internationally with request from Australia, the United States of America and international fisheries management organisations.

The co-operative tagging programme has been underway since 1975 mainly tagging billfish, kingfish, mako and blue sharks. More recently yellowfin tuna have been included in the programme. Participation in the gamefish tagging programme increased dramatically in 1988 when the Billfish Moratorium was implemented in the Auckland FMA. The moratorium prohibits the retention of any commercially caught billfish with the exception of swordfish caught by domestic vessels.

In the cooperative tagging programme, recreational anglers voluntarily tag and release gamefish and report release and recapture information. For species such as striped marlin, Pacific bluefin tuna, mako and blue sharks the majority of the recreational catch is released. The spatio-temporal data are used to characterise these fisheries.

A detailed review of the programme is planned for 2008/09. The outcomes of that review will be used in ensuring New Zealand receives the best possible outcomes from this research programme. The outputs of the review will be used in improving this programme in 2009 and beyond.

This research is necessary because:

- gamefish catches are significant to the recreational sector and the gamefish tagging programme is seen by that sector as particularly important;
- the programme has also provided important background information on a variety of species for fisheries management purposes; and
- the project has been identified as integral to the gamefish component of the New Zealand Pelagic Fisheries Medium Term Research Plan.

Within this context, this research project is considered a **high** priority.

Objectives 1 2, 3, 4, 5 & 6

In recent years the programme has been supported by the New Zealand Big Game Fishing Council who have purchased and distributed tags; and, by the Ministry of Fisheries who has funded the recording and processing of release and recapture information.

The successful tenderer will be expected to liaise with the New Zealand Big Game Fishing Council to ensure the successful outcome of this project.

Data from the programme will be managed in line with the Ministry of Fisheries research database management standards and specifications.

An annual report will be required for each year of the programme covered by this project. These reports should summarise information such as the number of fish tagged and recaptured for each species, and information on movements (see PEL2003/01 reports).

*Weighting of Objectives:*

Weightings indicate the relative importance of each of the objectives. The weightings for the objectives in this project are (in order): 0.166, 0.166, 0.166, 0.166, 0.166 and 0.166.