# Cruise proposal for the 2004/2005 SBT Acoustic Monitoring Survey of the Recruitment Monitoring Program ( Japan )

Fisheries Agency of Japan
National Research Institute of Far Seas Fisheries

(参考)

# ２００４年度豪州水域におけるみなみまぐろ資源調査の概要

**【第二大慶丸（１９８ﾄﾝ)】**

**加入量モニタリング音響調査**

**（１）調査目的**

**ミナミマグロ幼魚分布域を通過する１歳魚の分布量を、ソナーを用いて測定する。調査は、オーストラリアとの共同調査の一環として１９９４年より継続している調査である。本年度は特にこれまで行われていた調査を長期モニタリングに適した形に変更していくための基礎的な情報・実験的な情報収集も合わせて行うことを目的とする。**

**（２）調査方法**

**①ソナーを用いたライントランセクト手法によるミナミマグロ幼魚の分布量調査**

**②各種音響機器を用いた自然状態及び生簀内でのミナミマグロの音響特性調査との比較実験**

**③各種標識によるミナミマグロ分布・移動の調査**

**④海洋観測及び生物試料サンプリング**

**（３）調査日程**

**２００４年１２月１６日～２００５年3月２０日**

**（４）調査海域**

**南緯３２～３８°、東経１１２～１２４°に囲まれた海域、豪州 EEZ を含む**

**（５）調査機関**

**独立行政法人水産総合研究センター　遠洋水産研究所**

# REQUEST FOR FOREIGN RESEARCH VESSEL TO CONDUCT MARINE SCIENTIFIC RESEARCH IN AUSTRALIAN WATERS

List of the abbreviations used in the text:

| | |
|---|---|
| **CCSBT** | Commission for the Conservation of Southern Bluefin Tuna |
| **CSIRO** | Commonwealth Scientific and Industrial Research Organization (Australia) |
| **CTD** | Conductivity -Temperature Depth meter |
| **FAJ** | Fisheries Agency of Japan |
| **FRA** | Fisheries Research Agency (Japan) |
| **NRIFSF** | National Research Institute of Far Seas Fisheries (Japan) |
| **NRIFE** | National Research Institute of Fisheries Engineering (Japan) |
| **SBT** | Southern Bluefin Tuna |
| **RMP** | Recruitment Monitoring Program (Australia-Japan joing program) |
| **WA** | Western Australia |
| **WAFIC** | Western Australia Fishing Industry Council |

The Fisheries Agency of Japan wishes to request permission for the Japanese vessel, ***R/V DAINI (No.2) TAIKEI-MARU***, which will conduct one marine scientific cruise as one of the components within Scientific Research Program under CCSBT in Australian waters.

We provide the following information in support of this request. The information is listed in accordance with the format of the Guideline provided.

The research plan of this cruise will be proposed and reviewed at the forthcoming Scientific Committee of the CCSBT which will be held in September 2004. The overall research activities of the Australia-Japan Collaborative SBT Recruitment Monitoring Program will be reviewed and discussed at the RMP Review workshop as well as at the Australia-Japan joint research workshop which are planned in November 2004. Australian scientists (CSIRO) are expected participants all of these meetings. The information provided here is subject to change, as a whole or in part, depending to outcomes from those review processes. In case of change, a revised version will be delivered promptly.

NOTE:

1. SBT stock has been managed under the CCSBT. At the 7th CCSBT commission meeting (held in Sydney from 18 to 21 April 2001), the draft Scientific Research Program (SRP) developed at the 5th Scientific Committee meeting (held in Tokyo from 19 to 24 March 2001) was approved. *Recruitment monitoring program* is one of the 9 components within the SRP. This survey will take place as one of components within the Scientific Research Program under CCSBT.

2. Regarding the survey, Japan will present cruise proposals at the 2004 Scientific Committee meeting of CCSBT.

# INFORMATION IN SUPPORT OF A REQUEST BY A FOREIGN RESEARCH VESSEL TO CONDUCT MARINE SCIENTIFIC RESEARCH WITHIN THE AUSTRALIAN TERRITORIAL WATERS,EXCLUSIVE ECONOMIC ZONE,AND ON THE AUSTRALIAN CONTINENTAL SHELF

## (a) Full Description of the Marine Scientific Research Project

Nature:

The survey is a part of research activities to be conducted under the joint research program between **CSIRO** (Australia) and **FRA** (Japan), *Recruitment monitoring program*, which has been maintained since 1988. This program is also approved as one component of the SRP under the CCSBT in 2001. The main purpose of the program is to obtain a series of abundance indices of juvenile southern bluefin tuna (SBT) which will assist resource management of this species. This specific survey has been developed to obtain estimation of age 1 SBT abundance using an acoustic survey technique. The survey plan and results under the program have been discussed and reviewed at the annual workshop of this program as well as at the scientific forum of the CCSBT or the tri-lateral informal arrangement for the conservation of this species.

Objectives:

- To obtain abundance indices of juvenile SBT (age 1) migrating through a pre-determined survey area (pre-fixed survey area: see attachment 2) using a consistent procedure with the one used in previous years.
- To examine a distribution of juvenile SBT outside of the pre-fixed survey area mentioned above, including coastal areas, the east side of the pre-fixed survey areas, and the area between Fremantle and Esperance.
- To collect basic information required for an evaluation of indices as well as for a development of an automatic processing system of acoustic data .
- To examine oceanographic and biological environmental conditions of the survey area.
- To deploy archival tags and/or sonic tags to SBT before migrating into the pre-fixed survey area.

Proposed methods and equipment to be used:

- **Line-transect survey:** In order to obtain abundance indices of juvenile SBT (age 1), line transect survey with a high performance omni scan sonar and a scientific echo sounder will be conducted within the pre-fixed survey area (the area encompassed with 34o54.4'S 118o41.1'E,

34o20'S 119o50.1'E, 34o20'S 121o30'E, 34o40'S 121o30'E, 34o40'S 119o 56.7'E and 35o11.5'S 118o53.7'E. Species identification and estimation of biomass of schools recorded with acoustic devices will be conducted by on-board sonar specialists. Fish will be collected by trolling and line poling for a confirmation of species identification done by sonar specialists.

- **Opportunistic survey:** Fish school distribution adjacent to the line-transect survey area will be examined through a high performance omni scan sonar and a scientific echo sounder. Again, species identification and estimation of school biomass as well as occasional confirmation of species identification through catching specimens will be made by on-board sonar specialists. Distribution of fish school will be also examined using the same procedure during the trip between Fremantle and Esperance.
- **Other acoustic experiments:** Several experiments will be conducted to collect basic data on acoustic characteristics of SBT and equipments during line-transect and opportunistic surveys as well as in a separate setting. This may include collaborative parallel survey with Australian based small vessels, comparison of omni-scan sonar with commercial sonar performances, observation of school shapes with side-scanning sonar, measurement of sound speed of SBT muscle, and observation and monitoring of swimming position and speed, muscle and abdominal temperatures of live SBT kept in cage with under-water video camera, acceleration logger, and temperature data loggers.
- **Oceanographic observations:** Portable CTD will be cast up to near sea bottom to examine a general oceanographic feature of the survey area. Casts will be made, at every course altering point during line-transect survey and any other time and places judged as appropriate.
- **Deployments of various tags:** SBT caught for species confirmation during survey will be released with archival tags, sonic tags or data logger for temperature or acceleration when fish are in an appropriate condition for tag-release. Hearing stations for sonic tags will be deployed and removed by a small boat hired by Australian counterparts for the Recruitment Monitoring Program.
- **Biological sampling:** SBT caught for species confirmation during survey but not suitable for tag-release will be used for collecting otoliths, stomach contents, and other biological materials. Research Mortality allowance will be applied to the CCSBT to cover the SBT mortality related to these biological sampling. A certain amount of various bait fish will also be sampled for an examination of their acoustic characteristics.

**(b) Vessel Information**

| | |
|---|---|
| Vessel Name | *"Daini (No.2) Taikei-maru"*<br>(Owned by Taikei fishing Inc., Ishinomaki-city, Miyagi, Japa |
| Means of Propulsion | Engine: (860kw) |
| Configuration/Dimensio | LOA (37.31 m)<br>Breadth (7.80 m)<br>Depth (3.40 m)<br>Gross tonnage (198 t :IGT 312 t)<br>Compartment (20 persons) |

**(c) Frequencies of Devices (See Appendix 1)**

**(d) Deployment of Equipment**

No deployment of equipment will be planned during this cruise except daily deployment and retrieval of fishing gears.

**(e) Proposed Itinerary (tentative)**

| Yr | Mo | Day | Schedule |
|---|---|---|---|
| 2004 | 12 | 16 | Lv. Ishinomaki-city, Miyagi, Japan (via Lombok Strait) |
| 2005 | 1 | 3 | Ar. Fremantle<br>(Field technicians and scientists to be on-board) |
| | 1 | 5 | Lv. Fremantle |
| | | | Fremantle→Esperance (within the AFZ)<br>- Examination of distribution of SBT with acoustic devic<br>- Tag-deployments (sonic tags and archival tags) |
| 1/8-2/25 | | | - Acoustic line-transect survey<br>(within the AFZ, including the Australian territorial water<br>- Cage experiments of acoustic characteristics of live SBT<br>(20-27 Jan., 2005)<br>- Collection of basic acoustic and biological data and samples<br>- Tag-deployments (sonic tags and archival tags) |
| | | | Esperance → Fremantle (within the AFZ)<br>- Examination of distribution of SBT with acoustic devic<br>- Tag-deployments (sonic tags and archival tags) |
| | 2 | 28 | Ar. Fremantle<br>(Filed technicians and scientists disenbark) |
| | 3 | 2 | Lv. Fremantle |

| | | | |
|---|---|---|---|
| | 3 | 20 | Ar. Ishinomaki (Japan) |

**(f) Scientific Research Areas (Map: Appendix 2)**

The area encompassed by 32°S/112°E (the left upper corner of the survey area) and 38°S/124°E (the right lower corner).

**(g) Sponsoring Institutions and Related Information**

| | |
|---|---|
| Sponsor Agency | Fisheries Agency of Japan (FAJ)<br>Director General: Fumio TAHARA |
| Supervisors on Scientific Project | Fisheries Research Agency (FRA)<br>Director :Kyoichi KAWAGUCHI<br>National Research Institute of Far Sears Fisheries (NRIFSF)<br>Chief Scientists : Sachiko TSUJI |
| Operator Agency | Fisheries Research Agency (FRA) |
| Contact Persons | Moriaki Satani (FRA) |
| Master of the vessel | Fishing master : Hidehiko ABE<br>Captain : Osamu ASANO |
| Owner of the vessel | Taikei Fishing Inc., Ishinomaki-city, Miyagi, Japan<br>Director : Keietsu OGATA |

**(h)-i Australian Scientists/Participants**

This survey is a part of Australia-Japan research program, 'the Recruitment Monitoring Program'. Contact points within Australia are as follows:

- Person in charge of the whole program :
  John GUNN (CSIRO, Hobart)
- Contact point for an acoustic collaborative survey :
  Alistair HOBDAY (CSIRO, Hobart)
- Agency organizing Japanese activities within Australia :
  Richard STEVENS (WAFIC)

John Totterdell, an experienced WA based SBT fisherman and a vessel skipper, will be onboard to guide and assist the vessel master. Additional two Australian based survey assistants will be on board to assist data recordings and sample collection.

**(h)-ii Results of the Survey**

Preliminary and final results of the survey and relevant researches will be reported to the scientific forum of the CCSBT and the annual workshops of the

Recruitment Monitoring Program.

Data and samples collected during the survey will be shared by the participating members of the Australia-Japan collaborative Recruitment Monitoring Program following to the agreed rules of the Program.

**(i) Relationship & Agreements between Australia and Japan**

The survey is a part of Australia-Japan research program, 'the Recruitment Monitoring Program'. Contact points within the Australia are described in **(h)-i**.

SBT mortalities caused through this survey will be covered with the Research Mortality Allowance (RMA) of the CCSBT. Government of Japan is responsible for securing appropriate RMA with CCSBT's approval before the initiation of this proposed cruise.

**(j) Sharing the Benefits**

Neither commercial nor financial benefits are expected from this survey. However, when such benefits are recognized, Japan ishappy to develop ways to share those benefits to satisfy both sides.

**(k) Manipulation on the Australian Continental Shelf**

Only biological samples will be taken from the Australian waters. The survey include catch of SBT and other pelagic species. SBT mortalities caused through this survey will be covered with the Research Mortality Allowance (RMA) of the CCSBT as mentioned above.

No manipulation on continental shelf is planned in this survey.

**(l) Radio Active/Hazardous Materials On-board:**

No radioactive or hazardous substances are on board.

# Part I (A)

**(a) Itinerary for Australian Port Visits (tentative) :**

- Fremantle 3-5 January and 28 February – 2 March, 2005
  Additional visits to Albany and/or Esperance may be needed depending weather conditions and other requirements.

Maximum period staying within the Australian waters:
16 December, 2004 – 20 March, 2005

**(b) Radio Frequencies:**

Attached as **Appendix 1**

**(c) Australian Scientific Organization or Contact Persons:**

- Person in charge of the whole Program :
  John GUNN (CSIRO, Hobart)
- Contact point for the acoustic collaborative survey :
  Alistair HOBDAY (CSIRO, Hobart)
- Agency organizing Japanese activities within Australia :
  Richard STEVENS (WAFIC)

**(d) Onboard Crew and Investigators**

**-Crews (tentative)**

| Positions | Name | Birth Date | Birth Place | Passport ID | Expiry Date |
|---|---|---|---|---|---|
| Fishing Maste | Hidehiko ABE | Jan. 29, 1939 | Japan | TE7987086 | Jan. 27, 2008 |
| Captain | Osamu ASANO | Nov.19, 1967 | Japan | TF5068810 | Dec. 9, 2009 |
| Chief engineer | Hidetoshi ABE | Apr. 1, 1946 | Japan | TG3755809 | Jul. 25, 2013 |
| Radio operator | Shunichi HENMI | Mar. 6, 1935 | Japan | MR4424587 | Aug. 4, 2008 |
| 1st Officer | Masanobu MAIYA | Sep. 5, 1971 | Japan | MR4742939 | Dec. 9, 2009 |
| 1st Engineer | Katsunori SATOMI | May 29, 1960 | Japan | TG3755970 | Jul. 30, 2013 |
| 2nd Engineer | Yuji KONDO | Feb. 25, 1971 | Japan | TF2600779 | Mar. 4, 2009 |
| Boatswain | Naoto OIKAWA | Jun. 24, 1947 | Japan | TG4513427 | Dec. 11, 2013 |
| Deck hand | Tatsuo SATO | Aug. 10, 1946 | Japan | MR4424244 | Jul. 30, 2008 |
| Deck hand | Takeshi UEKI | Oct. 1, 1951 | Japan | TE1284574 | Mar. 8, 2006 |
| Deck hand | Sadao YAMAMOTO | Jul. 6, 1942 | Japan | MR4424091 | Jul. 25, 2008 |
| Oilier | Chihiro ENDO | Apr. 5, 1952 | Japan | TE3859179 | Nov. 18, 2006 |
| Oilier | Eiji ONODERA | Sep. 17, 1955 | Japan | TF5067433 | Nov. 26, 2009 |

| | | | | | |
|---|---|---|---|---|---|
| Cook | Shizuo TAKEYAMA | May 25, 1958 | Japan | under applicat | |

## -Scientists and Field Technicians (tentative)

| Name | Birth Date | Birth Pla | Period Aboard | Passport ID | Expiry Date |
|---|---|---|---|---|---|
| To be decided | | | Jan.3 – Mar. 2 | | |
| Ko FUJIOKA | Aug. 3, 1981 | Japan | Jan.3 - Mar. 2 | TG1797708 | May 10, 2012 |
| Yoshimi TAKAO | Sep. 23, 1962 | Japan | Jan.3 - Jan.27 | TG0085042 | May 25, 2011 |
| Yuichi TSUDA | Oct. 6, 1977 | Japan | Jan.20 - Mar. | under | |
| Koki ABE | May 23, 1971 | Japan | Jan.20 - Jan.31 | application | |
| Kazushi MIYASHIT | Jul. 16, 1968 | Japan | Jan.20 - Jan.27 | | Jun. 30, 2007 |
| Kentaro HONDA | Aug. 1, 1980 | Japan | Jan.20 - Jan.27 | TE6278644 | Jun. 27, 2012 |
| | | | | TG2008619 | |

Appendix 1

# Frequency List of DAINI(No.2)TAIKEI-MARU

## 1.Conpulsory Equipment

| | Type | Frequency(kHz) | | | Power(W) | Note |
|---|---|---|---|---|---|---|
| MF/HF | F1B | 2169 | 2187.5 | | 100 | |
| | | 2177 | 2189.5 | | | |
| | | | | | | |
| | F1B | 4207.5 | 6313 | 4180.5 | 250 | |
| | | 6312 | 8415.5 | 6275.5 | | |
| | | 8414.5 | 12578 | 8391.5 | | |
| | | 12577 | 16805.5 | 12521 | | |
| | | 16804.5 | 18899 | 16721 | | |
| | | 4208 | 22375 | 16872 | | |
| | | 6312.5 | 4209 | 22318 | | |
| | | 8415 | 6313.5 | | | |
| | | 12577.5 | 8416 | | | |
| | | 16805 | 12578.5 | | | |
| | | 18898.5 | 16806 | | | |
| | | 22374.5 | 18899.5 | | | |
| | | 4208.5 | 22375.5 | | | |
| | | | | | | |
| | A1A | 2047.5 | 2070 | 2075 | 100 | |
| | | 2091 | 2297.5 | 2350 | | |
| | | 2745 | 3235 | 3317.5 | | |
| | | | | | | |
| | A1A | 4-16, 22MHz | | | 200 | 32, 40, 48, 51 |
| | | | | | | |
| | J3E | 1705 | 1715 | 1738.5 | 100 | |
| | | 2182 | 2235 | 2394.5 | | |
| | | 2785 | 2832 | 3302 | | |
| | | | | | | |
| | J3E | 4125 | 6215 | 8291 | 200 | |
| | | 12290 | 16420 | | | |
| | | | | | | |
| | J3E | 4, 8-16, 22MHz | | | 200 | 72 |
| | | | | | | |
| | J3E | 4-22MHz | | | 200 | 65 |
| | | | | | | |
| | J3E | 4, 12-16, 22MHz | | | 200 | 96 |
| | | | | | | |
| VHF | F2B | 150MHz | | | 25 | CH70 |
| | | | | | | |
| | F3E | 150MHz | | | 25 | CH6,CH8,CH10,CH12-CH14 |
| | | | | | | CH16, CH18, CH20, CH22 |
| | F3E | 158.17MHz | 158.57MHz | | 25 | |
| | | 159.21MHz | | | | |
| Radar transponder | Q0N | 9350MHz | | | 0.4 | |
| Satellite epirb | G1B | 406.025MHz | | | 5 | |
| | A3X | 121.5MHz | | | 0.05 | |
| Two-way VHF radiotelephone apparatus | F3E | 150MHz | | | 0.8 | CH15, CH16, CH17 |

2.Other Equipment

| | Type | Frequency(kHz) | | | Power(W) | Note |
|---|---|---|---|---|---|---|
| VHF | F3E | 158.17, 158.57, 159.21MHz | | | 25 | |
| | | | | | | |
| HF | J3E | 27054.5 | 27058.5 | 27166.5 | 25 | |
| | | 27174.5 | 27210.5 | 27234.5 | | |
| | | 27274.5 | 27334.5 | 27362.5 | | |
| | | 27410.5 | | | | |
| | | | | | | |
| | H3E | 27524 | | | 6 | |
| | | | | | | |
| | | | | | | |
| MF/HF | A1A | 2047.5 | 2070 | 2075 | 250 | |
| | | 2297.5 | 2350 | 2745 | | |
| | | 3235 | 3317.5 | | | |
| | | | | | | |
| | A1A | 4-16, 22MHz | | | 250 | U1, 32, 40, 48, 51, 55, 56 |
| | | | | | | |
| | J3E | 1705 | 1715 | 1738.5 | 50 | |
| | | 2182 | 2235 | 2394.5 | | |
| | | 2785 | 2832 | 3302 | | |
| | | | | | | |
| | J3E | 4, 8-16, 22MHz | | | 200 | 72 |
| | | | | | | |
| | J3E | 4-16 , 22MHz | | | 200 | 65 |
| | | | | | | |
| | J3E | 4, 12-16, 22MHz | | | 200 | 96 |
| | | | | | | |
| MF | A2B | 2331.5 | | | 3 | |
| | | | | | | |
| Radar | P0N | 9410MHz | | | 25KW | |
| | | | | | | |

3.Wireless Telephone

| Type | Frequency(kHz) | Note |
|---|---|---|
| Wireless Telephone (1) | JRC/JSB-28 ( 27MHz ) | |
| Wireless Telephone (2) | JRC/NTD-1011 ( 27MHz ) | |
| Wireless Telephone (3) | JRC/JHV-1151 ( 150MHz ) | |
| Wireless Telephone (4) | JRC/JHV-234 ( 150MHz FM ) | |

4.Sonar

| Type | Frequency(kHz) | Note |
|---|---|---|
| FURUNO CSH-23 | 40L kHz | |
| FURUNO FSU-24 | 26L kHz | |

**Appendix 2**

**roposed Survey Area ( R/V DAINI (No.2) TAIKEI-Maru**
**The Acoustic Monitoring Survey**