Project no. **502572**

FISBOAT

FISHERIES INDEPENDENT SURVEY-BASED OPERATIONAL ASSESSMENT TOOLS

Instrument : STREP

Thematic Priority : 8.1

FINAL PLAN FOR USING AND DISSEMINATING KNOWLEDGE

Period covered: from 01 March 2004 to 30 June 2007

Start date of project: 01 March 2004 Duration: 40 months

Project coordinator name : Pierre Petitgas
Project coordinator organisation name : IFREMER

Revision : draft 1

Contents

Overview table 2
Research articles 3
ICES CM Papers 3
Conference papers 3
Working Documents to ICES and GSCM Expert Groups 4
Website 4
ICES 2007 Theme Session O 4
Publication project - Fisboat special volume 5
Incorporation of FISBOAT methods into the Fisheries advisory toolbox 6

Overview table

Date	Type	Type of audience	Countries addressed	Size of audience	Partner responsible / involved
April 2004	Conference	GFCM-FAO	European + Mediterranean	60	Sibm
June 2004	Fisboat website http://www.ifremer.fr/drvecohal/fisboat/	Public	worldwide	worldwide	Ifremer
October 2004	Fisboat Leaflet	Public and Research	Europe	≈ 700	Ifremer
February 2005	Conference	Fisherman Associations	Italy	20	Sibm 1 paper
May 2005	Conference	Fisherman Associations	Italy	15	Sibm 1 paper
May 2005	Conference	Marine Biology Scientists	Italy	40	Sibm 1 paper
Sept. 2005	Conference ICES ASC	Research	International	≈ 700	Armines, Ifremer 2 papers
Jan. 2006	Working group Association Française d'Halieumétrie	Research	France	20	Armines , Ifremer 1 paper
June 2006	Conference ICES Symposium	Research	International	≈ 500	Imperial College, Ifremer 2 papers
Sept 2006	Conference ICES ASC	Research	International	≈ 700	Armines, Ifremer, I.Coll. 3 papers
Nov. 2006	Working group ICES WGACEGG	Research	International	≈ 20	Ifremer, Azti 3 papers
March 2007	Working group GFCM stock assessment	Research	Mediterranean countries		Sibm 1 paper
March 2007	Working group ICES WGMGM	Research	International		Cefas 1 paper
March 2007	Working group ICES HAWG	Research	International		Frs 1 paper
June 2007	Conference Association Française d'Halieumétrie	Research	France	≈ 100	Ifremer 1 presentation
July 2007	Press	European Parlement	European countries		Ifremer interviewed 1 article
Sept 2007	Conference ICES ASC	Research	International	≈ 700	Armines, Ifremer, Cefas, Sibm 5 papers
2007	Publications	Research	International		Cefas, Ifremer, Armines 6 articles
2008	Publication of a special journal volume expected	Research	International		Ifremer, Cefas, all partners

Research articles

Cotter, J., Mesnil, B. and Piet, G. 2007. Estimating stock parameters using year class curves. ICES Journal of Marine Science, 64: 234-247.

Kell, L., Mosqueira, I., Grosjean, P., Fromentin, J.-M., Garcia, D., Hillary, R., Jardim, E., Mardle, S., Pastoors, M., Poos, J. and Scott, F. 2007. FLR : an open-source framework for the evaluation and development of management strategies. ICES Journal of Marine Science, 64: 640-646.

Poulard, J.-C. and Trenkel, V. (accepted). Do survey design and wind conditions influence survey indices ? Canadian Journal of Fisheries and Aquatic Sciences

Trenkel, V., Rochet, M.-J. and Mesnil, B. 2007. From model-based prescriptive advice to indicator-based interactive advice. ICES Journal of Marine Science, 64: 768-774.

Trenkel, V. (in revision). A biomass random effects model (BREM) for fish stock assessment and management with application to Bay of Biscay anchovy. Canadian Journal of Fisheries and Aquatic Sciences.

Woillez, M., Poulard, J.-C., Rivoirard, J., Petitgas, P. and Bez, N. 2007. Indices for capturing spatial patterns and their evolution in time with an application on European hake (Merluccius merluccius) in the Bay of Biscay. ICES Journal of Marine Science, 64: 537-550.

ICES CM Papers

Cotter, J., Fryer, R., Mesnil, B., Needle, C., Skagen, D., Spedicato, M-T. and Trenkel V. 2007. A review of fishery-independent assessment models, and initial evaluation based on simulated data. ICES CM 2007/O:04.

Cotter, J., Petitgas, P. et al. 2007. FISBOAT manual of indicators and methods for assessing fish stocks using only fishery independent survey data. ICES CM 2007/O:27.

Petitgas, P., Poulard, J.-C., Radtke, K., Spedicato, M.-T., Ibaibarriaga, L., Politou, C.-Y., Korsbrekke, K. , Deernberg, C. and Fernandes, P. 2007. Comprehensive indicator-based diagnostics of fish stocks using fishery-independent survey data: the FISBOAT report. ICES CM 2007/O:16.

Pomarede M., Simmonds E. J., Hillary R., McAllister M., Kell L., Needle C., 2006. Evaluating the management implications of different types of errors and biases in fisheries resources surveys using a simulation-testing framework. ICES CM 2006/I:28.

Poulard, J.-C. and Trenkel, V. 2005. Relationship between survey indices and survey design and wind conditions: Bay of Biscay groundfish survey. ICES CM 2005/Z:02

Spedicato, M.-T., Woillez, M., Rivoirard, J., Petitgas, P., Carbonara, P. and Lembo, G. 2007. Usefulness of the spatial indices to define the distribution pattern of key life stages: an application to the red mullet (Mullus barbatus) population in the south Tyrrhenian sea. ICES CM 2007/O:10.

Trenkel, V. 2007. A biomass random effects model (BREM) for stock assessment using only survey data: application to Bay of Biscay anchovy. ICES CM 2007/O:03.

Woillez, M., Petitgas, P., Rivoirard, J., Poulard, J.-C., and Bez, N. 2005. Indices for capturing spatial pattern and change across years of a fish population: an application on European Hake (Merluccius merluccius) in the Bay of Biscay. ICES CM 2005/L:16.

Woillez, M., P. Petitgas, J. Rivoirard, J.-C. Poulard, P. Fernandes, R. ter Hofstedte, K. Korsbrekke, A. Orlowski, M.-T. Spedicato and C.-Y. Politou. 2006. Relationships between population spatial occupation and population dynamics. ICES CM 2006/O:05

Woillez, M., Rivoirard, J. and Fernandes, P. 2006. Evaluating the uncertainty of abundance estimates from acoustic surveys using geostatistical conditional simulations. ICES CM 2006/I:15

Woillez, M., Rivoirard, J., Petitgas, P. and Deerenberg, C. 2007. Selecting and combining survey based indices of fish stocks using their correlation in time to make diagnostics of their status. ICES CM 2007/O:07.

Conference papers

Pomarede M., Hillary R., Kell L., Needle C, Simmonds E. J., McAllister M., 2006. Evaluating the relative merits of fishery dependent and independent data in fisheries management. ICES Symposium on Fisheries Management Strategies, June 27th-30th Galway, Ireland.

Trenkel, V., Rochet, M.-J. and Mesnil, B. 2007. From model-based prescriptive advice to indicator-based interactive advice. ICES Symposium on Fisheries Management Strategies, June 27th-30th Galway, Ireland.

Working Documents to ICES and GSCM Expert Groups

Cotter J., Fryer R., Mesnil B., Needle C., Skagen D., Spedicato M.-T. and Trenkel V. 2007. A review of Fishery-Independent assessment models, and initial evaluation based on simulated data. Working Document to the ICES Working Group on Methods of Fish Stock Assessment, Woods Hole, March 2007

Ibaibarriaga L. and Petitgas P. 2006. Catchability analysis between abundance estimates with DEPM and Acoustic methods. Working Document to the ICES Working Group on Acoustic and Egg surveys for sardine and anchovy in ICES areas VIII and IX, Lisbon November 2006.

Petitgas, P., Massé, J., Beillois, P. and Coppin, F. 2006. Proposition for a common data base structure for acoustic surveys. Working Document to the ICES Working Group on Acoustic and Egg surveys for sardine and anchovy in ICES areas VIII and IX, Lisbon November 2006.

Spedicato M.T., M. Woillez, J. Rivoirard, P. Petitgas, P. Carbonara, G. Lembo. 2007. Usefulness of the spatial indices to define the distribution pattern of key life stages: an application on the red mullet population in the south Tyrrhenian sea. GFCM-SAC-Sub-Committee Stock Assessment. Workshop on trawl survey based monitoring fishery system in the Mediterranean, Rome, Italy, 26-28 march 2007. 15 pp.

Trenkel, V. 2006. Combining acoustic and DEPM survey indices in the biomass random effects model for stock assessment. Working Document to the ICES Working Group on Acoustic and Egg surveys for sardine and anchovy in ICES areas VIII and IX, Lisbon November 2006.

Website

The FISBOAT web site http://www.ifremer.fr/drvecohal/fisboat/ was an important tool for dissemination and is expected to carry on that role. The website is expected to be maintained and will give access to project outcomes and related matters. All project products are available on the website: software codes and their documentation, data, case study reports, manuals of methods, project deliverables. All meeting documents were also posted on the website (agendas, meeting reports) as well as project reports (interim and final). Six documents were produced that compiled the project outcomes: a Manual of indicators and methods and a Report on their application to case studies, a Report on survey-data-only assessment models and their performance, a Manual on the FLR simulation evaluation loop and a Report of its application to case studies, a Report on how to create comprehensive assessments.

ICES 2007 Theme Session O

IFREMER organised and co-chaired the ICES 2007 Annual Science Conference Theme Session O on 'Flying outside the ICES Assessment WG paradigm – Alternative approaches to providing fisheries management advice'. The Theme session was intended to be a forum for presenting alternative methods using fishery-independent information and stakeholder involvement for provide effective means to diagnosing the status of marine resources and communities and identifying management alternatives. The report available at : http://www.ices.dk/iceswork/asc/2007/themesessions.asp). Papers from the Fisboat project presented reviews of fishery-independent methods (O:4, O:16), described the manual produced by the project (O:27), provided application to case studies (O:10), and examples of the application of techniques (O:3, O:7). The final discussion led to suggest that ICES considers alternative stock assessment methods alongside traditional methods for selected stocks as a means of complementing current methods.

Publication project - Fisboat special volume

IFREMER and CEFAS organised to publish jointly the novel fishery-independent assessment methods developed and their case study applications in a special volume of the journal Aquatic Living Resources. The special volume is expected to be written in a Manual style. Publication is expected for the end of 2008. The contents of the volume has been organised as follows.

Manual of Fish Stock Assessment using Surveys and Indicators
Eds. P. Petitgas (Ifremer), J. Cotter (Cefas), V. Trenkel (Ifremer), B. Mesnil (Ifremer)
Special volume of Aquative Living Resources

Introduction

Article no.01 : Fish Stock Assessment using Surveys and Indicators : an overview (Petitgas)

Section 1 : Surveys and indicators

Article no.02 : Choices of surveys and indices (Cotter, Trenkel)
Article no.03 : Manual of biological indicators (Trenkel, Cotter et al.)
Article no.04 : Manual of spatial indicators (Woillez, Rivoirard)
Article no.05 : Combining raw indicators into multivariate indicators (Petitgas, Poulard, Rivoirad)

Section 2 : Methods to analyse time trends and changes

Article no.06 : Non parametric methods for trends (Cotter)
Article no.07 : Detection of recent trends and power analysis (Trenkel, Bogaards)
Article no.08 : A statistical process control approach to detect change (Mesnil, Petitgas)
Article no.09 : Analysis with Min/Max autocorrelation factors (Woillez, Rivoirard)

Section 3 : Fishery-indepent assessment methods and management strategies

Article no.10 : Indicator-based assessment and forecasting (Trenkel, Petitgas, Woillez)
Article no.11 : Fishery-independent assessment models (Mesnil, Cotter, Trenkel, Needle et al.)
Article no.12 : Fishery-independent management strategies and control rules (Cotter, Bogaards et al.)

Section 4 : Simulation methods
Article no.13 : Manual on FLR tools (Hillary et al.)
Article no.14 : Manual on ALADYM (Lembo, Abella, Fiorentino, Spedicato)

Section 5 : Illustrative applications

Article no.15 : Indicator-based methods applied to case studies (Petitgas, Poulard, Radtke et al.)
Article no.16 : FLR tools applied to case studies (Apostolaki, Ibaibarriaga, Bøthun, Bogaards, Pomarede)
Article no.17 : ALADYM applications to case studies (Spedicato, Poulard, Radtke, Politou et al.)

Concluding articles

Article no.18 : Comprehensive assessments and management strategies (Cotter, Petitgas, Mesnil, Abella et al.)
Article no.19 : Perspective from an invited author external to the Fisboat project

Incorporation of FISBOAT methods into the Fisheries advisory toolbox

Fisboat simulation evaluation tools have been used during the course of the project in working groups of assessment bodies: FLR has been used for testing harvest rules on North Sea herring (ICES) and ALADYM for testing technical measures on red mullet (GFCM). Indicator-based methods are expected to be applied within ICES in 2008 for contributing to the assessment of data poor species at the ICES Working Group on Assessment of New MoU Species (WGNEW). Little information is known on these species but time series of survey data exist and the European Commission is asking for scientific advice on them. The ICES Study Group on Management strategies (SGMAS) may be a forum for continued collaborative methodological development of fishery-independent methods, in particular on what management rules to develop based on indicator-based assessments and methods and tools for evaluating harvest control rules. In addition, the EU project IMAGE (Indicators for fisheries management in Europe) may allow to continue on some of the topics developed in the Fisboat project. Also, the new science program of ICES is expected to develop coordinated research activity on the Identification of indicators, models and methods to ensure high quality advice for integrated management under the ecosystem approach.

Thus fisheries management is now clearly envisaged in an ecosystem approach and there is an emerging need for indicator based assessments for data poor species but also for integrated ecosystem management. The fisheries advisory tool box of methods is therefore expected to expand and the fishery-independent assessment methods developed in the Fisboat project are thus expected to be in the list of new methods. Further developments of fishery-independent methods for ecosystem and fish stock monitoring,assessment and advice are expected to take place in the coming years, which will build on the Fisboat project outcomes. The Fisboat Manual of methods and applications (special volume) is expected to contribute to that purpose.