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Report of the Study Group on Survey Trawl Standardisation (SGSTS)

19-20 April 2007

Galway, Ireland

International Council for the Exploration of the Sea
Conseil International pour l'Exploration de la Mer

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Contents

Executive summary

This meeting of the Study Group on Survey Trawl Standardisation (SGSTS) was focussed on the planning for the publication of an *ICES Cooperative Research Report* on this subject. As such the main aims were to review the material collected thus far, and to identify any gaps in that material.

The SG concluded that the material was better presented as two separate CRR. The first to be a generic survey trawl document addressing issues common to all or most survey otter trawls. The second would collate all the material on the GOV trawl, used in the IBTS survey. This trawl is relatively unique in being used in a multi-national survey where data are explicitly combined, and where standardization is particularly important.

The structure of the generic survey trawl CRR was agreed as follows.

- Specification for survey gears – procurement and construction
- Specification for survey gears – Preparation for sea, shakedown, calibration
- Specification for survey gears - Maintenance of gear at sea
- Trawling Performance Monitoring
- Training & Personnel
- Gear changes and intercalibration
- Ideal Survey Trawl – State of the art
- Overview, Exec summary & Bibliography

Information gaps were identified on:

- Elaboration of the procedures for shakedown prior to surveys and for standard calibration tows to be used as part of the shakedown
- Information on new surveillance tools e.g. tilt sensors, and clarification of methods for integrating the analysis of the data
- Addition of section detailing new personnel training model adopted by DFO Canada
- Updated on recent calibration work in Scotland & Ireland, and any other relevant work in the literature
- Comparison of GOV to “Ideal” as previously completed for the Campelen

A timetable for the final drafting, collation and editing was agreed and a final product delivery data of April 2008 agreed.

The structure of the GOV trawl standardization CRR was agreed as follows:

- Current status of GOV trawls used in the ICES area. – to include what deviations from the standard document currently existed, possible impacts of these, and where possible recommendations on a coherent new standard
- Standard guidelines for attachment of ground gear to fishing lines. To update the very weak guidelines in the IBTS manual.
- History of changes in GOV gear/rigging – given the 30 year history of this net, and the many changes in materials, construction, rigging and survey practice that have occurred, this section will provide a timeline and impact assessment to place future possible changes in context.
- Recommendations for GOV standard outside the North Sea – SGSTS recognizes that while the GOV is appropriate for surveys in the North Sea, it may be less so for western European waters. This section will make a series of recommendations for suitable improvements to the trawl for use in these areas, and propose a new standard for this area.

The second CRR would be reviewed in April 2008 and presented for publication by agreement thereafter.

1 Introduction

1.1 Terms of Reference

a) compile text material for proposed *ICES Cooperative Research Report*;

b) identify and document any gaps in material and assign writing responsibilities;

c) provide timetable for *ICES Cooperative Research Report* publication.

1.2 Participants

A list of participants can be found in Annex 1 of this report.

2 Compilation of text material for ICES Coop Research Report (ToR "a")

2.1 Structure and chapters for the CRR

Following discussion, it was agreed to compile the text material into eight chapters for the CRR. In order these were:

1. Specification for survey gears – procurement and construction –

This chapter will provide guidance on how to specify a net and its construction from the procurement stage through to final purchase or construction. The guidance will draw heavily on the experiences in the US and Newfoundland where extensive and detailed guidelines have been drawn up. This chapter will also cover details on net drawings and the use of net modelling software. The aim will be to provide a set of guidelines for trawl procurement and construction for three main survey gears.

- Campelen – as used in Norway and Canada
- Poly Nor Eastern - as used by NOAA in the NE USA
- GOV – as used in most European bottom trawl surveys

2. Specification for survey gears – Preparation for sea, shakedown, calibration

This chapter will provide guidance on the preparation of the net for deployment in a survey situation. It will include details of the putting together of the net components e.g. wires, groundgear, floats etc. It will also provide guidance on carrying out preliminary "shake down" at sea of the net and its associated components, to ensure that rigging and operation are correct, and standard. For this to work best, the text will also propose the use of standard calibration or test sites where the gear can be tested before every survey.

3. Specification for survey gears - Maintenance of gear at sea –

This chapter will concentrate on how to maintain a net onboard the survey vessel and during operations to retain a standardised configuration. It is not expected that maintenance at sea can be controlled or monitored in the way that we would on shore. This chapter will propose a reduced set of critical gear parameters to check following damage and/or repair to the net. The guidelines have been compiled by an international group of gear experts, and are designed to help less knowledgeable cruise leaders keep their gear performing properly. The examples include the GOV and Campelen gears. This chapter will also include guidance on rotating use of nets at sea and for the retirement of nets after a period of use.

4. Trawling Performance Monitoring

This chapter will concentrate on the use and analysis of trawl monitoring technology. The first part will concentrate on the acquisition of key performance parameters; door and wing spread, headline height, and bottom contact. This will include advice on the specification, deployment, testing, and calibration. It will go on to deal with guidance on data screening and analysis as well addressing questions of within and between haul geometry variability and providing guidance on tolerances and valid tows. The second part of the chapter will also provide similar guidance on the use of other trawl surveillance instrumentation such as door angle, speed, symmetry, warp, net offset and catch. This will include an appraisal of how these parameters may impact on the catch rate and composition.

5. Training & Personnel

This chapter will provide guidance on what the survey crew need to know and be able to do to carry out a properly Quality Assured survey. This will in part be in terms of maintenance and use of the gear itself and the instrumentation (in relation to the above chapters). It will also include guidance on the involvement of the vessel crew before and during the survey, training of survey scientists in the important gear issues and the use of shakedown periods to test all survey components before the full scale survey starts.

6. Gear changes and intercalibration

This chapter will provide guidance on the questions of when and how to make changes in survey gear and whether these need to be calibrated – before and after – and if so how to carry that out. The chapter will reiterate the key concepts of; minor changes to approach the standard; modest changes that depart from standard, and major changes. The chapter is not intended to provide the type of “recipe book” approach to calibration given for other survey procedures. Rather it will detail the state-of-the-art in calibration methods and approaches and provide advice on how these might be conducted.

7. Ideal Survey Trawl – State of the art

The final main chapter will provide guidance on what would constitute the “ideal” survey trawl. It will present examples of where current survey gears differ from this ideal. It will also include the state-of-the-art for the New Norwegian Survey Trawl, which represents an example of the real world approaches that can be made to this ideal.

8. Overview, Exec summary & Biblio

The report will include an overview to summarise the key recommendations of the CRR, and to provide the background to the issues. It will also present a comprehensive bibliography related to survey gear use and standardisation. An executive summary will also be included.

2.2 Gaps in material required for completion of the report (ToR "b")

Much of the material needed for the CRR has been compiled for the first two reports produced by SGSTS. The main gaps identified by the group requiring additional text are presented in table 2.2.1.

Table 2.2.1. Chapters for CRR and current status.

CHAPTER	TITLE	STATUS
1	Specification for survey gears – procurement and construction	Largely completed
2	Specification for survey gears – Preparation for sea, shakedown, calibration	Elaboration of the procedures for shakedown and for standard calibration tows to be used as part of the shakedown
3	Specification for survey gears - Maintenance of gear at sea	Largely completed
4	Trawling Performance Monitoring	Requires information on new surveillance tools e.g. tilt sensors, and clarification of methods for integrating the analysis of the data
5	Training & Personnel	Largely completed – addition of section detailing new personnel training model adopted by DFO Canada
6	Gear changes and intercalibration	Largely completed – to be updated with recent work in Scotland & Ireland, and any other relevant work in the literature
7	Ideal Survey Trawl – State of the art	Largely completed – requires comparison of GOV to "Ideal" as previously completed for the Campelen
8	Overview, Exec summary & Bibliography	pending

2.3 Writing assignments (ToR "b")

Based on the chapter layout described in chapter 2.2, writing assignments are presented in table 2.3.1. In each case there is one person responsible for the chapter, although others will contribute material.

Table 2.3.1. Chapters for CRR and writing assignments.

CHAPTER	TITLE	WRITING ASSIGNMENTS (PRINCIPLES IN BOLD)
1	Specification for survey gears – procurement and construction	**Brian Harley** (CEFAS), assisted by Steve Walsh (DFO). Specific sections on: **Campelen** - Aril Engaas(IMR) **Poly NE** – Ken Weinberg (NOAA/AFSC) **GOV** – Frankie Griffin (IMI)
2	Specification for survey gears – Preparation for sea, shakedown, calibration	**Aril Engaas** (IMR) & Jim Ellis (CEFAS)
3	Specification for survey gears - Maintenance of gear at sea	**Rob Kynoch** & Kevin Peach (FRS)
4	Trawling Performance Monitoring	**Ken Weinberg** (NOAA/AFSC) & Dave Stokes (IMI). Input from Gerard Bavouzet (IFREMER) & Aril Engaas(IMR)
5	Training & Personnel	**Steve Walsh** (DFO) & Dave Reid (FRS)
6	Gear changes and intercalibration	**John Cotter** (CEFAS) – new material from Dave Reid (FRS) & Dave Stokes (IMI), and any other relevant work in the literature
7	Ideal Survey Trawl – State of the art	**John Willy Valdemarsen** (IMR) – GOV Comparison Frankie Griffin (IMI).
8	Overview, Exec summary & Bibliography	**Dave Reid** (FRS)

2.4 Timetable for publication (ToR "b")

The SG agreed that the preparation of the report would be on the following timetable:

September 2007 Completion of draft chapters and circulation within study group. Completed drafts will be circulated to other client and gear user groups for comment.

December 2007 Completion of Overview and Summary. Incorporation of external comments

March 2008 Final Collation and editing

April 2008 Present to WGFTB and FTC

3 Proposed additional CRR on specific standardisation issues for the GOV

The standardisation issues for the GOV are significantly more complex than for the other gears considered by SGSTS. Both the Campelen and the Poly Nor Eastern are used for single nation, and often, single vessel surveys. The GOV is used for a number of multi nation, multi vessel surveys, most importantly, the International Bottom Trawl surveys in the North Sea and in Western European waters. As such the standardisation issues are more complex and require more detailed documentation. SGSTS recommends that a separate CRR be produced that specifically addresses the GOV. The advantage of this would be that users of the GOV would be able to find all pertinent information in a single dedicated volume. The report would also be much easier to find via internet search engines. If accepted the report would be constructed as follows.

1. Current status of GOV trawls used in the ICES area

This section would comprise of comparisons between existing GOVs in operation on surveys to the standard drawings provided in the IBTS manual. This would encompass all gear components from the doors to the cod end. It would include materials, construction and rigging. It would use the critical factor check list developed by SGSTS and presented in Section 3.2.2 of the 2006 report.

The procedure would be for FRS to prepare an example from experience in Scottish IBTS surveys. This would be circulated to all GOV users in SGSTS (FRS, IMI, IMR, IFREMER, CEFAS, and DIFRES) and subsequently to all other users within the IBTS community.

This section would be collated and edited by FRS – Dave Reid, Rob Kynoch and Kevin Peach.

2. Standard guidelines -ground gear to fishing lines

The current IBTS manual contains almost no information on the method for attachment of the ground gear to the fishing line. This raises considerable potential for inadequate rigging and consequent impacts of the way the net fishes. A new section will prepared for the manual covering this and any other relevant aspects of the ground gear rigging.

This section would be collated and edited by CEFAS & IMI – Brian Harley & Frankie Griffin

3. History of changes in GOV gear/rigging

The GOV has been in use for IBTS and other surveys for over thirty years. While there have been standards applied during that time it is recognised that there may have been a number of changes to the net construction and its use, both documented and undocumented. These may extend from material changes, to rigging and set up, and through to actual use on the surveys. It is proposed to document all known changes that the group and other contacts can provide to develop a history and timeline of any changes. This will include the net itself and how it is used. For instance the introduction of different ground gears, the use of differing lengths of sweep with depth and including aspects such as switching to half hour tows. The aim of this is to provide users with an understanding of how much change has actually occurred over time, and to allow proposed new changes to be seen in this perspective. Where possible, the potential impact of any documented changes will be described.

This section would be collated and edited by FRS with contributions from IMR, IMI, IFREMER, CEFAS and others.

4. Recommendations for GOV standard outside NS

Apart from the surveys within the North Sea, the GOV is used in many surveys on the western European shelf. Historically, these surveys have not all used the GOV. For those that do, there is nor real agreed standard, beyond simply following that for the North Sea. However, the fishing grounds in this area are often much more aggressive than those found in the North Sea, e.g. west of Scotland, Porcupine Bank or in the English Channel. This tends to require heavier ground gear or even rock hopper gear, as well as other features to strengthen the net e.g. belly lines or tearing strips. Additionally the species encountered are different and in different abundances. For example, the French surveys in Biscay use a GOV without a kite, to reduce the bulk of pelagics in the area. In consequence it has proven difficult to establish the IBTS North Sea pattern as a standard. The obvious solution would be a completely new net, that is robust to these and other area specific needs. To date no agreement exists on what such a net might look like, although the Norwegian Survey Trawl may be a candidate. In the interim, the group will attempt to establish a generally acceptable standard for GOV bottom trawl surveys in this area, based on the Gov configurations currently deployed.

This section would be collated and edited by IMI – Dave Stokes

It is proposed that a draft be prepared in time for a short meeting held within WGFTFB in April 2008. Publication timetable will be agreed then and work will continue by correspondence.

Annex 1: List of participants

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Annex 2: SGSTS Terms of Reference 2008

The **Study Group on Survey Trawl Standardisation** [SGSTS] (Chair: D. Reid, UK) will meet in Tórshavn, Faroes, from ??–?? April 2008 to:

a) Present completed *ICES Cooperative Research Report* on Generic Survey Trawl Standardization ;

b) Review draft *ICES Cooperative Research Report* on GOV standardization;

SGSTS will report by 30 June 2008 to the attention of the Fisheries Technology Committee.

Supporting Information

PRIORITY:	High: Bottom trawls provide fisheries independent data used in stock assessment of many commercial finfish and shellfish species worldwide. Minimizing survey variability is a key issue in developing accurate and reliable time series of abundance. In 2003 ICES mandated that all users of survey gears within ICES should develop a programme of standardization.
SCIENTIFIC JUSTIFICATION AND RELATION TO ACTION PLAN:	Action Plan: 1.125, 1.13.4, 4.10 –a), Action Plan: 1.13.1, 5.4, -b), Action Plan: 1.13.1, 5.4 -c), Action Plan: 1.13.1, 5.4. -d), Action Plan: 1.13.1, 5.4. -e), Action Plan: 6.3-f) There are continuing developments in trawl design and instrumentation available for surveys. Requirements for surveys may be changing such as the possibility of absolute abundance estimates being needed as a result of lower reliability of fishery dependent data. In recent years there have been criticisms of protocols associated with some surveys. As a result of all these developments, it is recognised that a review and possible development of a new programme of standardization and quality control are needed. For example, a Study Group (SGSTG) has recently identified the need for some changes to current practice in the IBTS Western Waters surveys. The study group are working towards an ICES CRR providing comprehensive guidelines for: • Trawl Gear specification (Generic and GOV) • Trawl monitoring • Gear Maintenance at sea • Training and Personnel issues • Changes and calibration • Ideal survey trawls and candidates
RESOURCE REQUIREMENTS:	No ICES resources
PARTICIPANTS:	Members of the WGFTFB, WGFAST, IBTSWG
SECRETARIAT FACILITIES:	None required above report compilation
FINANCIAL:	No financial implications.
LINKAGES TO ADVISORY COMMITTEES:	ACFM and ACE
LINKAGES TO OTHER COMMITTEES OR GROUPS:	WGFTFB, WGFAST, WGIBTS, all trawl survey and trawl based assessment groups
LINKAGES TO OTHER ORGANIZATIONS:	Links to FAO via WGFTFB

Annex 3: Recommendation

The Study Group recommends the publication of an additional *ICES Cooperative Research Report* on GOV standardization, based on the work carried out by SGSTS.

RECOMMENDATION	ACTION
1. The study group recommends the publication of an additional *ICES Cooperative Research Report* on GOV standardization, based on the work carried out by SGSTS.	FTC to consider recommendation and confirm with Publications Committee.