SC/68A/GEN/04

Draft SC Handbook

INTERNATIONAL
WHALING COMMISSION

Scientific Committee Handbook
Working methods of the IWC's Scientific Committee

INDEX

1. INTRODUCTION

1.1 The Scientific Committee Handbook

The Scientific Committee Handbook (SC HB) is a guide to the Scientific Committee's working methods. These working methods have been developed and agreed by the Committee, and endorsed by the Commission since the first Scientific Committee meeting in 1950. The basis for this Handbook was prepared by Greg Donovan (IWC Head of Science) and Phil Hammond (former Scientific Committee chair). The more formal rules are incorporated into the Commission's Rules of Procedure. The Handbook is intended as an online easy source of information on the Scientific Committee working methods and activities. It contains all cross-references to the IWC Rules of Procedures and Financial Regulations and to any other decision of the Commission relevant for the Committee. This guide is complemented by the 'Annex 1': a consolidated compilation of full documents on the Scientific Committee rules, working methods, guidelines and protocols' as agreed by the Committee and endorsed by the Commission (see Annex 1). The SC HB also links the relevant sections to a number of IWC webpages and portals (section 10).

The SC HB and its 'Annex 1' represent the Committee's method of working. They are periodically updated to ensure that (a) they represent the Committee's most efficient working methods (this is a standing agenda item at the Committee's annual meetings) and (b) incorporate all instructions received from the Commission (e.g. via Resolutions or reports). All updates are discussed and agreed by the Committee in Plenary. Any proposed changes to these working methods is subject to discussion by the full Committee and approval by the Commission.

This Handbook is updated annually after the Scientific Committee report is approved and any proposed amendments to it or to the formal Rules of Procedure are submitted to the Commission for its consideration at each biennial meeting.

1.2. The Scientific Committee

The Scientific Committee was established by the Commission in 1950. This in part is a reflection of Article IV of the Convention that refers to scientific research and the publication of results, statistics and reports and in part a reflection of Article V.2 of the Convention that states that *inter alia* Schedule amendments '...shall be based on scientific findings....'. It has met each year[LINK TO WEB PAGE: https://iwc.int/historical] since then.

The Scientific Committee was established in accordance with the Commission's Rule of Procedure M.1 and its general terms of reference are given in Rule M.4 and in the preambular section Rules of Procedure of the Scientific Committee, available here (Annex 1: Chapter 1).

The Scientific Committee covers a wide range of scientific subjects with respect to the conservation and management of cetaceans (see section 9). These are covered in its broad Agenda over each biennium. Its agenda is based upon the draft agenda submitted by the Committee to the Commission for comment and approval and any general or precise instructions given by the Commission at its biennial meetings.

The primary Terms of Reference of the Scientific Committee are drawn from the text of the International Convention for the Regulation of Whaling which established the IWC, including its Schedule:

- Encourage, recommend, or if necessary, organise studies and investigations related to whales and whaling (Convention Article IV.1(a))
- Collect and analyse statistical information concerning the current condition and trend of whale stocks and the effects of whaling activities on them (Article IV.1 (b))
- Study, appraise, and disseminate information concerning methods of maintaining and increasing the population of whale stocks (Article IV.1 (c))
- Provide scientific findings on which amendments to the Schedule shall be based to carry out the objectives of the Convention and to provide for the conservation, development and optimum utilization of the whale resources (Article V.2 (a) and (b))
- Publish reports of scintific activities and findings (Article IV.2)
- Review current threats and methods to mitigate them in order to maintain cetacean populations at viable levels (Rule of Procedure M.4)
- Receive, review and comment on Special Permits issued for scientific research (Article VIII.3 and Schedule paragraph 30)
- Assess stocks subject to aboriginal subsistence whaling (Schedule paragraph 13(b))
- Review research programmes of Contracting Governments and other bodies (Rule of Procedure M.4)

The work of the Scientific Committee is further directed by the Commission via three routes:

- instructions in resolutions addressed to the scientific committee,
- relevant decisions made during the meetings of the Commission; and
- via the review of the Scientific Committee's report at the Commission meeting.

Some of the key resolutions are listed here:

- Conduct Comprehensive Assessment of whale stocks (Rep. int. Whal. Commn 34:30)
- Implement the Revised Management Procedure (Rep. int. Whal. Commn 45:43)
- Develop the Aboriginal Subsistence Whaling Management Procedure (Rep. int. Whal. Commn 45:42-43)
- Study effects of environmental change on cetaceans (Rep. int. Whal. Commn 43:39-40; 44:35; 45:49)
- Advise the Commission on scientific aspects of whale sanctuaries (Rep. int. Whal. Commn 33:21-2; 45:63)
- Advise the Commission on scientific aspects of small cetaceans (Rep. int. Whal. Commn 41:48; 42:48; 43:51; 45:41)
- Advise the Commission on scientific aspects of whalewatching (Rep. int. Whal. Commn 45:49-50)
- Resolution on the Scientific Committee (Resolution 2014-4).
- Further incorporate the contribution made by live cetaceans to ecosystem functioning into their work (Resolution 2016-3)

Resolution 2014-4 on the Scientific Committee, also includes a comprehensive list of previous resolutions that also relate to the work of the Scientific Committee.

The Rules of Procedure (RoP) of the Scientific Committee are decided by the Commission and published biennially in the Report of the Commission Meeting as well as being available here (Annex 1: Chapter 1).

This document has been developed to provide a relatively simple explanation of the work of the Scientific Committee and its procedures and to be of value for scientists and non-scientists alike. It is intended to be a living document, regularly updated and incorporated into the IWC website. A pdf version of this document may be found here[LINK TO THE PDF VERSION OF THE SC HANDBOOK AND ALL APPENDIXES].

2. PLACE IN THE COMMISSION SYSTEM

The Scientific Committee is one of four Committees established by the Commission, the others being the Finance and Administration Committee, the Technical Committee and the Conservation Committee (see Fig. 1).

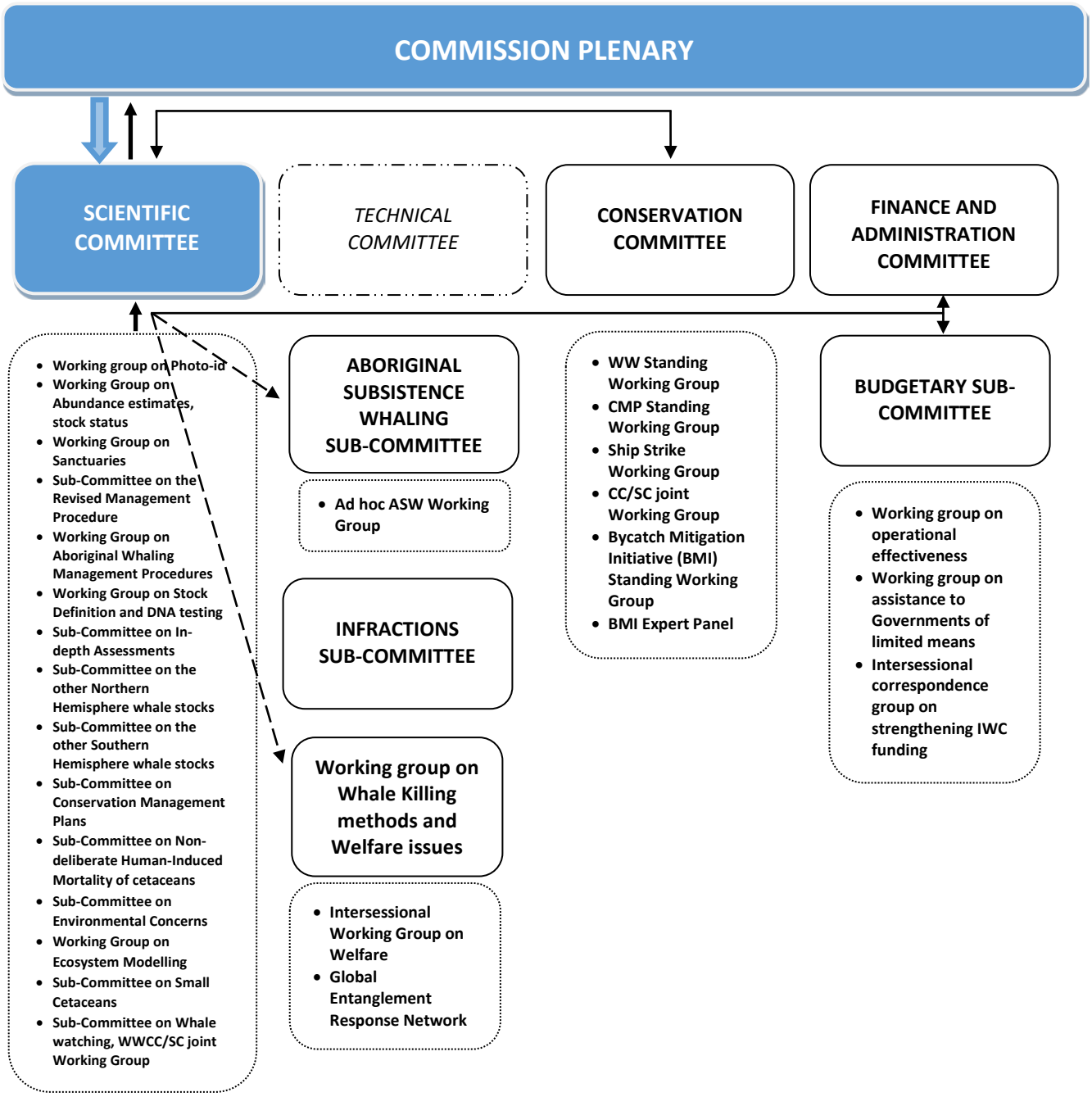


Figure 1. Schematic summary of IWC structure showing **information/reporting flow from the Scientific Committee**. The Technical Committee has not met in recent years. Note that the Commission instructs the Scientific Committee and agrees its workplan.

Formally, the Scientific Committee reports directly to the Commission (which considers the Scientific Committee's reports under appropriate items in its Plenary agenda) but in practice, some relevant sections of its reports are first reported to other bodies of the Commission, depending on their Agendas (see Table 1). (read more...[DROP DOWN BOX])

The Technical Committee has not met for several years but when it did meet the Scientific Committee used to provide advice on *inter alia* commercial whaling catch limits. The broad Scientific Committee agenda is determined by the Commission. Other Commission bodies can request the advice of the Scientific Committee via the Commission. Occasionally, individual Commissioners ask the Scientific Committee for advice and this is dealt with if time permits.

Table 1: Recent examples of the Scientific Committee first reporting to other bodies of the Commission

Commission body	Scientific Committee items
Aboriginal subsistence whaling sub-committee and Working Group on ASW	Aboriginal subsistence whaling management procedure (AWMP), advice on aboriginal subsistence whaling catch limits
Conservation Committee	Ship strikes, Whale watching, Conservation Management Plans, Small Cetaceans, Sanctuaries, Entanglements, Bycatch
Working Group on Whale Killing Methods and Welfare Issues	Strandings, Entanglements
Finance and Administration Committee	Rules of Procedure changes
Budgetary sub-committee	Research fund proposals

3. MEMBERSHIP AND OFFICERS

3.1 Membership (SC RoP A.1-7, C.5; Financial Regulations C.1)

The membership of the Scientific Committee comprises the following:

1. **National Delegates;** (read more...)[DROP DOWN BOX]

   National delegations are made up of scientists (SC RoP A.1) nominated by the Commissioner of each Contracting Government; there is no limit to the size of any delegation. Each country represented on the Scientific Committee nominates a Head of Delegation who has one vote, should voting be required. However, the Scientific Committee has chosen to work on a consensus basis to 'decide' scientific matters (see section 5) and voting is typically not used apart from occasionally with respect to choosing a Chair and/or Vice-Chair (SC RoP C.5; see also section 3.2).

   Under certain circumstances, an expert may be allocated national delegate status by a Contracting Government through an alternative path (see Financial Regulations C.1 on '*Voluntary Assistance Fund to facilitate Governments in Capacity to Pay Groups 1 and 2 that are not EU Member States or members of the Organisation for Economic Cooperation and Development to participate fully in the work of the Commission*').

2. **Invited Participants** (IPs)**;** (read more...)[DROP DOWN BOX]

   Invited participants are non-voting members of the Scientific Committee. Although treated as one category, IPs fall into two broad categories:

   1. those scientists and experts that are identified by the Convenors (see section 4.1.1) as providing necessary expertise to allow them to successfully complete the work of their group and for which funding will be provided by the IWC *if available*; and
   2. those scientists or other experts who have requested to participate in meetings of the Scientific Committee and admitted by the Chair of the Scientific Committee in consultation with the relevant Convenors. These IPs will be expected to show how they will contribute to the Committee's work and will commit to attend using their own funding.

   The timetable and process for Invited Participants is summarised below (SC RoP A.6):

At least 4 months prior to a meeting	Convenors suggest IPs based on draft agenda/workplan. Other scientists and experts may request to attend explaining their potential contribution to priority items.
3.5 months prior to a meeting	Chair in consultation with Convenors and Secretariat develop list of IPs and invitation letters sent stating that funding *may* be available. If prospective IPs cannot obtain their own funding, the Secretariat will prepare a costed list within two weeks. Governments are forwarded this list to ascertain whether they can offer funding for some of the listed scientists.
3 months prior to a meeting	Secretariat supply Chair with consolidated list of potential IPs and costs, for decisions on funding based on priorities and consultations with Convenors and Secretariat.
2 months prior to a meeting	IPs informed of outcome of funding requests. See Annex 1:Chapter 7 for full details.

   See Chapter 7.1 of Annex 1 for more details.

   Although IPs can participate fully in the Committee's scientific work, they are expected to use discretion with respect to recommendations pertaining to the Scientific Committee's procedures and policies, including catch limits and

management advice. IPs are also expected to use their discretion as regards their involvement in the formulation of potentially controversial material. The Chair, in Plenary sessions, or Sub-groups chairs, during their sessions, may identify such topics and may rule IPs out of order at his/her discretion (SC RoP A.5.g).

3. **Observers from accredited Inter-Governmental Organisations and Non-Governmental Organisations.** (read more...)[DROP DOWN BOX]
   The Scientific Committee has a history of co-operation with many relevant IGOs and regional agreements (including FAO, UNEP, ASCOBANS, ACCOBAMS, NAMMCO, CCAMLR, etc.). Those observers are subject to confirmation by the Chair of the Scientific Committee and may attend as non-voting members. IUCN (which has both governmental and non-governmental members) is accorded the same rights.

   As is the case for the IPs, although Observers can participate fully in the Committee's scientific work, they are expected to use discretion with respect to recommendations pertaining to the Scientific Committee's procedures and policies. They are also subject to the same rules of debate, as specified above (bullet point 2).

In addition, Scientific Committee meetings can be attended by **scientific representatives of non-member governments, observers from non-governmental organisations** (whose CVs show that they have sufficient scientific background to understand the technical discussions) and **local/independent scientists**, at the discretion of the Chair of the Scientific Committee (in consultation with the Chair and Vice-Chair of the Commission if the Chair believes attendance is inappropriate).

With respect to recommendations pertaining to the Committee's procedures and policies, all observers are also expected to use discretion and leave those decisions to the 'voting' members of the Committee.

3.2 Officers (RoP I, M.9 and SC RoP C)

The formal officers of the Scientific Committee are the **Chair** and the **Vice-Chair**; they are assisted by the IWC Secretariat's **Head of Science**. At present, the Chair and Vice-Chair are elected by the Heads of Delegation, normally every three years; unless there are special circumstances, the Vice-Chair succeeds the Chair automatically. Although voting can occur to allow the election of these officers, the preferred approach is to reach consensus.

The role of the Chair and Vice-Chair is to facilitate the work of the Scientific Committee in providing the best scientific advice to the Commission. As is the case for the Chair of the Commission, the Scientific Committee Chair's role is '*to serve the Commission, and as such, shall serve in an individual capacity and not represent the views of their Contracting Government, when acting as Chair*' (Commission Rule F.1). To accentuate this, when presenting the results of the Scientific Committee's work at the Commission meeting, the Chair of the Scientific Committee usually sits with the Secretariat's Head of Science and they work together to deliver the report and answer questions. The Chair and Vice-Chair take office at the end of the Commission meeting in years when they are elected. In years when the Commission does not meet the newly elected Vice-Chair take office [*term to be added once agreed by the Commission IWC67*].

The IWC Secretariat's Head of Science (HoS) is the liaison officer dedicated to support the Scientific Committee activities. The HoS also oversees the production of all IWC scientific meeting reports and publications (see sections 5.2-5.4).

Read all details on the role of these officers here[DROP DOWN BOX].

The primary tasks of the Chair of the Scientific Committee (usually carried out in consultation with the Vice-Chair and the Head of Science) are:

1. Annual Meeting related activities:
   a. to develop the draft agenda for the annual Scientific Committee meeting and circulate it 60 days in advance;
   b. to integrate any comments received on the draft agenda and circulate a revised draft agenda 21 days in advance of the Annual Meeting for discussion and adoption at the opening plenary;
   c. to develop a timetable and *modus operandi* for discussion and adoption at the opening plenary (see below);
   d. to appoint Convenors for sub-committees, standing working groups, etc. (see below);
   e. to approve invited participants, observers and local scientists (see section 4.1.1);
   f. to Chair Annual Meetings (Plenary sessions, including Special Permits);
   g. to organise and chair Convenors' meetings, including the post-meeting Convenors' meeting;
   h. to finalise the biennial budget and workplan of the Committee (last days of Plenary);
   i. to assist the Head of Science in finalising the Scientific Committee report.
2. Other intersessional work:

a. to determine the participation of the expert group to review special permits and chair their meeting (see below);
b. to chair the following groups:
    i. Standing Steering Group on Special Permits (this is a shared responsibility with Vice-Chair and HoS);
c. to participate in the following groups as an *ex officio* member:
    i. Data Availability Group;
    ii. Strandings Initiative Steering Group;
    iii. IWC-SORP Standing Steering Committee;
    iv. Commission Standing Working Group on Special Permit Programmes (Resolution 2016-2);
    v. Conservation Committee Standing Working Group on the Bycatch Mitigation Initiative;
    vi. Conservation Committee Standing Working Group on Conservation Management Plans;
    vii. Conservation Committee Whale Watching Working Group on Whale watching;
    viii. Joint CC/SC Working Group;
    ix. Review Group of the Voluntary Research Fund for Small Cetaceans;
    x. Steering Group for the Voluntary Conservation Fund.
d. to oversee the intersessional progress of the Scientific Committee on identified tasks (see 4.3);
e. to liaise with the Secretariat on the relevant work of all other bodies of the Commission (i.e. ASW, F&A, BS, CC);
f. to participate in Bureau meetings upon request;
g. to oversee the update of the recommendations database;
h. to present the work of the Scientific Committee to the Commission (biennially):
    i. prepare and present the 2-year summary of main recommendations and the biennial workplan of the Scientific Committee in conjunction with the Vice-Chair and Head of Science;

The Vice-Chair acts as Chair in his/her absence or if there is a conflict of interest. On those occasions, he/she exercises the powers and duties prescribed for the Chair. The primary tasks of the Vice-Chair of the Scientific Committee (usually carried out in consultation with the Chair and the Head of Science) are:

1. support to the Chair on Annual Meeting-related activities and intersessional activities;
2. to prepare the biennial budget of the Committee (for its approval in Plenary);
3. to chair the Data Availability Group;
4. to co-chair the Special Permits sessions;
5. to co-chair the Standing Steering Group on Special Permits (this is a shared responsibility with Vice-Chair and HoS);
6. to participate in the following groups as an *ex officio* member:
    i. Strandings Initiative Steering Group;
    ii. IWC-SORP Standing Steering Committee;
    iii. Conservation Committee Standing Working Group on the Bycatch Mitigation Initiative;
    iv. Conservation Committee Standing Working Group on Conservation Management Plans;
    v. Conservation Committee Whale Watching Working Group on Whale watching;
    vi. Joint CC/SC Working Group;
    vii. Review Group of the Voluntary Research Fund for Small Cetaceans;
    viii. Steering Group for the Voluntary Conservation Fund.

The IWC Secretariat's Head of Science (HoS) is the liaison officer with the Scientific Committee. The primary tasks of the HoS (usually carried out in consultation with the Chair and the Vice-Chair) are:

1. support to the Chair on Annual Meeting-related activities and intersessional activities;
2. to coordinate (including acting as Plenary rapporteur) all IWC scientific meeting reports and publications, with the assistance of other Secretariat staff;
3. to represent the Committee at scientific meetings of other IGOs when designated;
4. to co-chair the Standing Steering Group on Special Permits (this is a shared responsibility with Chair and Vice-Chair);
5. to participate in the following intersessional groups as an *ex officio* member:
    i. Data Availability Group;
    ii. Aboriginal Subsistence Whaling Working Group of the Commission;

iii. Strandings Initiative Steering Group;
iv. IWC-SORP Standing Steering Committee;
v. Conservation Committee Standing Working Group on the Bycatch Mitigation Initiative;
vi. Conservation Committee Standing Working Group on Conservation Management Plans;
vii. Conservation Committee Whale Watching Working Group on Whale watching;
viii. Joint CC/SC Working Group;
ix. Review Group of the Voluntary Research Fund for Small Cetaceans;
x. Steering Group for the Voluntary Conservation Fund;
xi. Other groups that the Scientific Committee or Commission may deem necessary.

The Committee is represented at the Aboriginal Subsistence Whaling Working Group of the Commission by two members selected by the Chair of the Scientific Committee. The current members in this role are Prof. Lars Walløe and Dr. Alex Zerbini.

A list of Chairs since the inception of the Committee is given in Table 2.[DROP DOWN BOX]

Table 2: Chairs of the Scientific Committee, 1950 onwards

Chair	Country	SC meetings chaired
N.A. MACKINTOSH	UK	1950-63
J.T. RUUD	Norway	1964
D.G. CHAPMAN	USA	1965-74
K.R. ALLEN	Australia	1975-79
J.L. BANNISTER	Australia	1980-82
M.F. TILLMAN	USA	1983-85
G.P. KIRKWOOD	Australia	1986-88
R.L. BROWNELL JR	USA	1989-91
P.S. HAMMOND	UK	1992-93
S.B. REILLY	USA	1994-96
J.L. BANNISTER	Australia	1997-99
J.E. ZEH	USA	2000-02
D.P. DEMASTER	USA	2003-05
A. BJØRGE	Norway	2006-09
D. PALKA	USA	2010-12
T. KITAKADO	Japan	2013-15
C.M. FORTUNA	Italy	2015-18
R. SUYDAM	USA	2018-

3.3 Conflict of interest

The Committee is mindful of the need to avoid potential or perceived situations of 'conflict of interest', especially regarding chairing duties or membership in evaluation groups (e.g. IWC-SORP and SMRF funding, chairing Special Permits or AWMP/IR discussions, etc.). Committee's members are encouraged to self-report any such situation that may concern them. Given their role, the Chair, Vice-Chair and Head of Science are often asked to take over additional duties when an unavoidable situation of 'conflict of interest' becomes apparent. In situations where they have themselves a conflict of interest, an *ad hoc* Chair may be appointed by consensus.

4. STRUCTURE AND MEETINGS (RoP M.4b, SC RoP C1-5, D1-3)

The primary meeting of the Scientific Committee is the **Annual Meeting** (in recent years usually been held for two weeks between mid-May and mid-June). In 2012, the Commission agreed to move to biennial meetings (usually at the beginning of October). The Scientific Committee continues to meet annually (about 100 days before the Commission in years when it meets). At the request of the Commission the Scientific Committee may hold full intersessional meetings on particular issues, but these are rare. The Scientific Committee may hold **Intersessional Workshops** that do not comprise the full Scientific Committee and the results are reported to the Scientific Committee at annual meetings; these workshops may either be on a specific one-off topic (e.g. climate change and cetaceans) or may be to make progress

with ongoing work of the Committee (e.g. with respect to in-depth assessments, *Implementations and Implementation Reviews* of the Revised Management Procedure or Aboriginal Subsistence Whaling Management Procedure).

4.1 The plenary and sub-groups

The authoritative body is the full Scientific Committee. Its broad agenda is set in response to the needs of the Commission and approved by the Commission biennially. The Scientific Committee's Rules of Procedure outline in the Terms of Reference, the primary topics of interest and their origin in either the Convention, Schedule, Commission Resolution or Commission decision. A more detailed two-year workplan and budget (highlighting priority topics and activities) is agreed each year the Commission meets and presented to the Commission for approval/modification. Both the workplan and budget are structured to allow some flexibility on the allocation of resources (i.e. time and funds) for additional activities arising from agreed intersessional work. In order to efficiently address its broad agenda, the Committee forms a number of sub-committees and working groups (generically called sub-groups), with their own convenors (for the duties of Convenors see Item 4.1.1) and rapporteurs. Rapporteurs play a vital role in the work of the Committee. They are members appointed by the relevant Convenors and their responsibility is to take notes during the sessions and develop a draft report (for the duties of Rapporteurs see Item 5.2).

All of these sub-groups are subservient to the whole Committee: their work is carried out in relation to the Committee agenda; therefore, sub-groups make recommendations to the Committee but it is the Committee that makes recommendations to the Commission. Occasionally, the full Committee does not agree with the conclusions or recommendations of a subgroup. Although this has been rare it is entirely proper - the Plenary is not obliged to rubber stamp a sub-group report or else discussions of such reports would be meaningless. See Item 5 to learn how these instances are handled in reports.

Some items of the Committee's agenda are dealt with only in Plenary sessions (i.e. cooperation with other International organisations, Special Permits, budget, working methods and Rules of Procedure). Read more on the sub-groups here.[DROP DOWN BOX]

The Chair decides on the appropriate sub-groups for the Annual Meeting based on the workplan and finalises this in the notes to the draft agenda circulated before each Annual Meeting (see example in Table 3).

Table 3: Example of sub-groups: 2017 Annual Meeting

Sub-committees/working group name	**Convenor**	**Co-convenor**
Scientific Committee Plenary, SC	Fortuna	Suydam
Plenary sessions on Special Permits, SC/SP	Fortuna	Suydam
Ad hoc Working group on interactions between Scientific and Conservation Committees, SC/CC	Parsons	Rojas-Bracho
Ad hoc Working group on Photo-id, PH	Olson	
Ad hoc Working Group on IWC Global Data Repositories and National Reports, GDR	Double	Miller (Secretariat)
Ad hoc Working Group on Abundance estimates, stock status and international cruises, ASI	Zerbini	Butterworth
Sub-Committee on the Revised Management Procedure, RMP	Bannister	
Standing Working Group on the development of an Aboriginal Whaling Management Procedures, AWMP	Donovan	Brandon
Working Group on Stock Definition and DNA testing, SD&DNA	Lang	Tiedemann
Sub-Committee on In-depth Assessments, IA	Palka	Herr
Sub-Committee on the other Northern Hemisphere whale stocks, NH	Brownell	
Sub-Committee on the other Southern Hemisphere whale stocks, SH	Jackson	Bell
Sub-Committee on Conservation Management Plans, CMP	Walløe	Urban-Rámirez
Working Group on Non-deliberate Human-Induced Mortality of cetaceans, HIM	Leaper	Currey
Standing Working Group on Environmental Concerns, E	Rowles	Hall
Working Group on Ecosystem Modelling, EM	Kitakado	
Sub-Committee on Small Cetaceans, SM	Scheidat	Porter
Sub-Committee on Whale watching, WW	Suydam	

It is the Chair's responsibility to appoint Convenors for each of the sub-groups; this requires a balance of several features including experience, geographical spread, good communication skills in English, and a balance of the need for new

perspectives with the need for continuity (more important in some groups than others). Participants select which sub-groups they plan to attend during online registration.

Sub-groups can be defined as follows:

(1) *Sub-Committees* - established by the Chair to efficiently address long-standing issues referenced in the Convention, Schedule or as a result of a specific request of the Commission.

(2) *Working Groups* - normally a spin-off from a Sub-committee (or the Plenary) on a specific agenda item that entails a serious increase in work load that cannot be handled by the sub-committee/Plenary and thus becomes a priority topic in itself. There are two types of Working Groups:

(a) *Ad hoc Working Groups (AWG)* that are created to accomplish a specific task (or set of tasks) expected to be achieved in the short-term which may complete their work and be dissolved or evolve into a Standing Working Group or sub-committee;

(b) *Standing Working Groups (SWG)* created in response to a request from the Commission on a specific topic (e.g. the development of an aboriginal subsistence whaling management procedure) or established by the Chair to address longer-term specific issues, perhaps evolved from the task of an *ad hoc* Working Group.

The Chair, in consultation with the Vice-Chair and HoS (Rule C), is in charge of the Committee organisation. Working groups and sub-committees are established or dissolved according to their proposals, approved by the Commission, with the exception of those groups identified by the Commission and indicated as 'standing' groups.

Sub-groups work synergistically to further the Committee agenda. Figures 2 and 3 shows how sub-groups interact in the species' and populations' pre-assessment and assessment process.

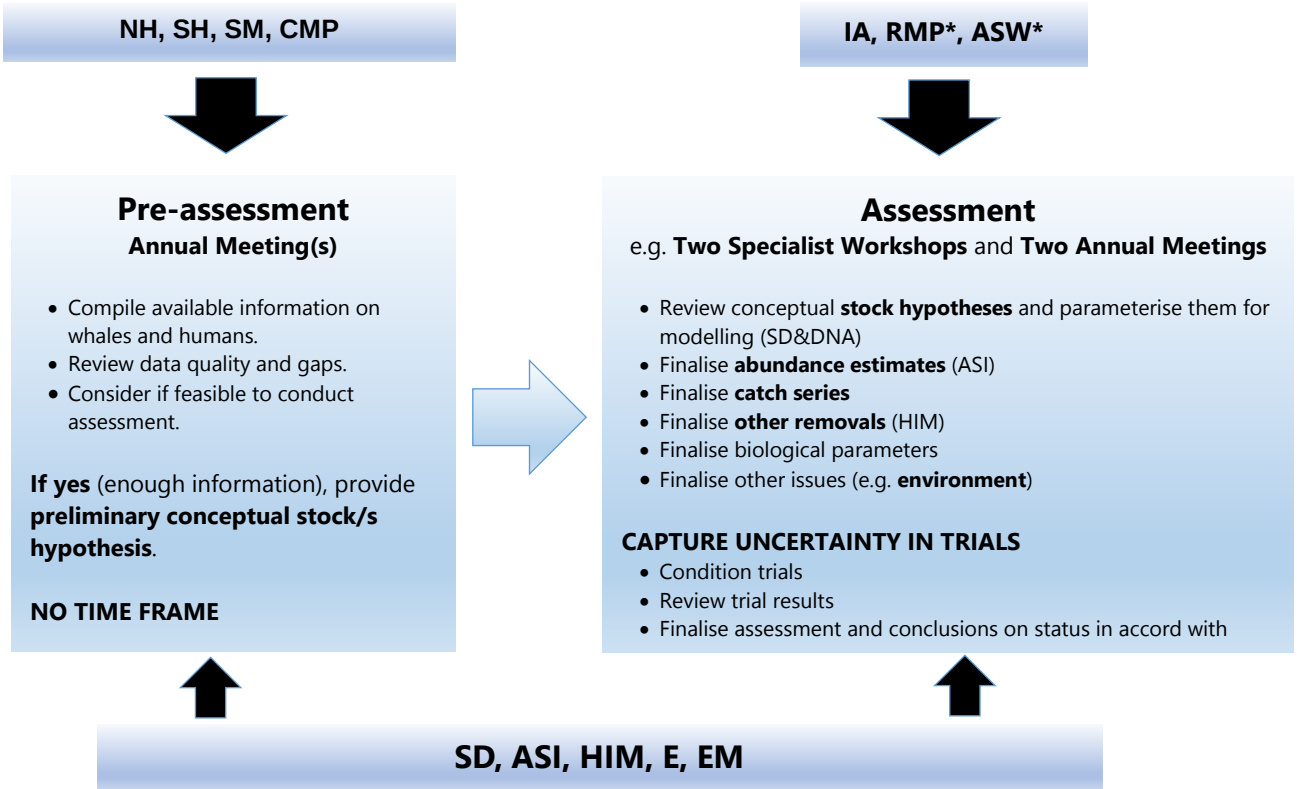


Figure 2. Working process within the Scientific Committee on species and populations assessments

Sub-groups work synergistically to further the Committee agenda. Fig. 2 and 3 shows how sub-groups interacts in the species' and populations' pre-assessment and assessment process. In particular, Fig. 3 shows an example for a pre-assessment of a species subject to a CMP.

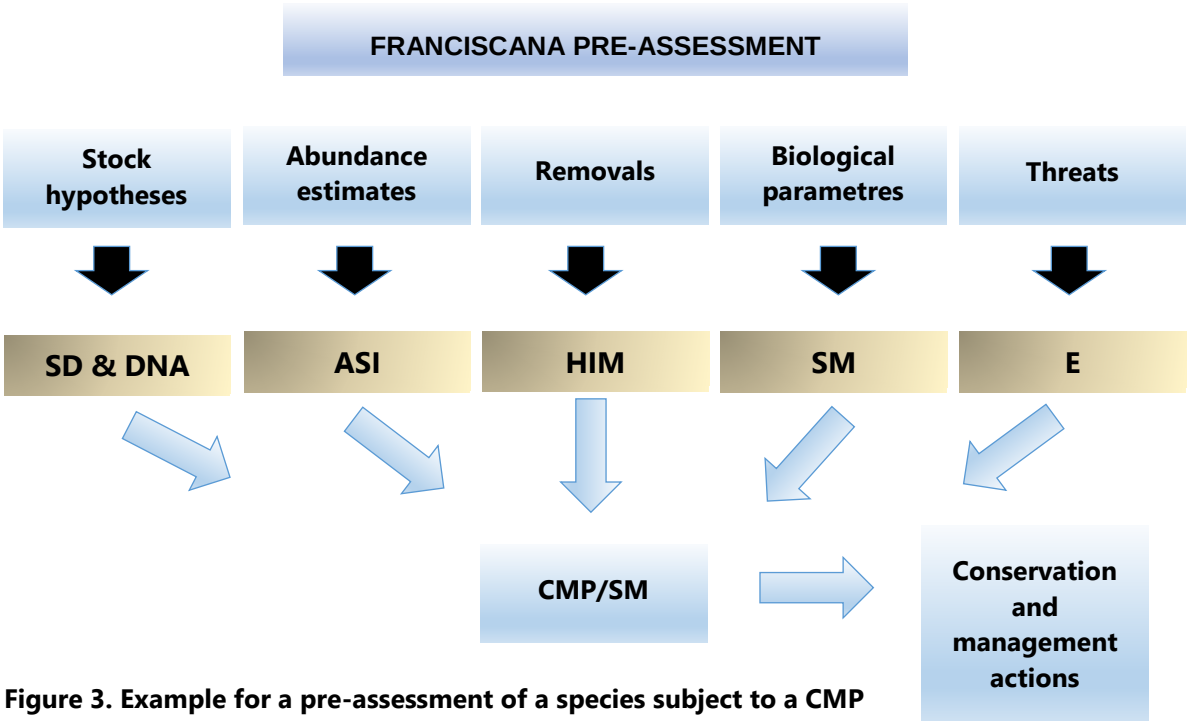


Figure 3. Example for a pre-assessment of a species subject to a CMP

4.1.1 The role of convenors, eligibility and duration of appointments

The Convenors' group is set in accordance to SC RoP D.3. Convenors are directly identified by the Chair and Vice-Chair (with advice from the Head of Science), who usually consult with other members of the Scientific Committee. A Co-convenor may be appointed to assist the Convenor of a sub-group and, at the same time, gain experience in chairing and learn Committee procedures. All Committee members (i.e. Delegates and IPs) are eligible to become Convenors or Co-convenors.

The role of the Committee's Chair and all Convenors is largely administrative and is to ensure that (a) the Committee functions properly (in line with the Committee's Rules of Procedure and the Commission's instructions); (b) all matters on the Committee's Agenda are discussed and that the necessary expertise is available during meetings to do so; and (c) that clear scientific advice is delivered to the Commission.

It is not their role to represent positions of Governments or others but rather to be sensitive to all viewpoints. The composition of the group may change annually due to contingencies or rearrangement of the sub-committees and working groups.

The 'Convenors' Group' comprises the Chair, Vice-Chair, Head of Science, Secretary to the Commission, Secretariat computing manager, Convenors and Co-convenors. This group is there to assist the Chair and Vice-Chair.

Requirements to be appointed as Convenor/Co-convenor include appropriate scientific background and/or chairing experience, knowledge of Committee procedures and appropriate communication skills. Being perceived as a balanced and fair Scientific Committee member is also a desirable characteristic.

Read more details on Convenors' responsibilities here.[DROP DOWN BOX]

A Convenor's responsibilities can be summarised as follows.

Intersessionally:

1. to facilitate intersessional progress on identified tasks including providing advice to the Chair as appropriate;
2. to identify potential invited participants for their sub-group in consultation with their sub-groups participants;
3. to assist the Secretariat during the intersessional editorial work for the publication of the final sub-group report and plenary Scientific Committee report;
4. review and approve/disapprove papers submitted to the Annual Meeting for relevance to each subgroup's agenda.

At the Annual Meeting:

1. to develop the draft agenda for the sub-group's work for discussion and agreement at an organisational meeting of the sub-group;

2. when elected chair (as is normally the case, unless there is a formal objection from the floor) by the sub-group at its opening meeting, they are expected:
   (a) to meet daily in the Convenors' Group to determine the business and timetable for the coming days;
   (b) to provide advice to the Chair on other meeting-related matters should they arise;
   (c) to chair the sub-group meetings efficiently and fairly and if necessary establish small expert groups;
   (d) to authorise working papers should they be deemed necessary (see below);
   (e) to develop budget requests relevant to their subgroup;
3. to recruit and appoint rapporteurs and ensure the sub-group's report follows the guidelines for reports, and to draft and present a summary of the sub-group report to the full Plenary which will compose the relevant sections of the Plenary report;
4. to develop with other members of the Convenors' Group a prioritised list of workshops, studies, or other projects proposed for funding (that list needs to be made available to the full Committee at least by 6pm on the penultimate day of the Scientific Committee Annual Meeting);
5. to ensure that the final version of the sub-group report is completed by the end of the day after the Scientific Committee meeting;
6. to meet in the Convenors' Group the day after the Scientific Committee meeting to finalise the draft workplan for the coming year(s).

The Scientific Committee Chair, in consultation with the Vice-Chair and the Head of Science, appoints Convenors/Co-convenors and thus retains discretion on the composition of the Convenors' Group that works with and advises him/her.

On the last day of the Scientific Committee meeting of the year of the appointment of a new Vice-Chair and the inception of the new Chair, it shall be assumed that all Convenors/Co-convenors have completed their terms. However, the new Chair and Vice-Chair may reconfirm Convenors/Co-convenors for the following term, if they are available and willing. This will be usually done at the meeting of the Convenors' Group the day after the Scientific Committee meeting. The Scientific Committee Chair and Vice-Chair, in consultation with the Head of Science, may replace or invite Convenors/Co-convenors whenever they deem it appropriate.

4.2 Logistics

Discussions at Annual meetings follow a similar pattern each year (e.g. see Table 4 in the drop-down box below). Plenary opens on the first day. Additional morning Plenary sessions may be called during the following week, e.g. to deal with Special Permits. The more detailed scientific work is undertaken by sub-committees or working groups over the following week (see Item 4.1); the final three days are held in Plenary sessions, primarily to review the work of the sub-groups, discuss working methods and the Committee's budget and to agree the report. (read more...)[DROP DOWN BOX]

The workload of the Committee is such that simultaneous sessions of sub-groups must be held; whilst every attempt is made by the Convenors to avoid clashes of sub-groups with overlapping participants, this is not always possible. The aim is to have a scheduled 105 sessions (three concurrent sub-group meetings for each of five work sessions per day, starting at approximately 08:30 and ending typically at 18:00). If possible, formal evening sessions are avoided to allow: (1) rapporteurs to draft reports; (2) time for small break out groups (e.g. to do simulation runs and testing); and (3) dedicated sessions on particular topics that can be attended by all. See Table 4 below for an example time schedule.

Table 4: Example time schedule for an Annual Scientific Committee meeting.

Date	Items	Comments
First day	Plenary session, then read documents	SC Agenda Items 1-4, plus begin other items as appropriate
Second to ninth days	Predominantly sub-groups (possibly some short plenary meetings)	To organise the work, complete sub-group agendas and agree reports
Tenth day	*Tentative* rest day with no meetings	Subject to cancellation if insufficient progress is made....
Eleventh to thirteenth days	Plenary sessions. Intention to finish no later than 5pm on the last day	To complete agenda and agree report, including work plan and draft initial agenda for next Annual Meeting
Fourteenth day	Convenors to complete editorial work on sub-group and plenary reports and attend the final Convenors' Group meeting; consider refinements of the draft initial agenda, priorities, and changes in organisational structure implied by the draft initial agenda or by discussions during the meeting.	

4.3 Intersessional Groups

As a large part of the work of the Scientific Committee occurs intersessionally, the Committee and its sub-groups may establish intersessional groups at each Annual Meeting. The lifespan of such groups is one year, they must report their progress at the following Annual Meeting and they must be formally re-established if the work is ongoing. There are three types of intersessional groups:

1. *Steering Groups* (SG);[DROP DOWN BOX]
   Steering Groups (SG) are groups that have been set up to ensure that particular meetings, workshops or identified pieces of work are completed by the next Annual Meeting. They have the authority to make decisions on behalf of the Committee within the context of their terms of reference (e.g. meeting budget spends, participants, agreements on parameters for analyses). Numbers are limited and membership is agreed at the Annual Meeting although the Convenor of the SG may request additional members or respond to late requests to be members. The expected outcomes will be either a workshop/meeting report or an analytical paper.
1. *Intersessional Correspondence Groups* (ICG);[DROP DOWN BOX]
   Intersessional Correspondence Groups (ICG) are groups that have been set up to ensure progress on particular topics within the intersessional period. Membership is more flexible and open. It is expected that a written report/working paper on progress will be submitted to the appropriate sub-group or to the Committee at the Annual Meeting.
2. *Advisory Groups* (AG);[DROP DOWN BOX]
   Advisory Groups (AG): these are occasional groups established by the Committee to provide scientific and technical advice on specific issues if requested by a Contracting Government or the Scientific Committee.

The existing Intersessional Correspondence Groups, together with their Terms of Reference and membership can be found here (LINK TO WEB PAGE: https://iwc.int/correspondence-groups).

Intersessional Correspondence Groups are not to be considered as a substitute for intersessional meetings.

5. REPORTS AND PAPERS (SC RoP E1-5)

The Committee informs its discussions at its Annual meetings through the use of a range of different types of document. Specific rules are applied on how to handle their submission and discussion. Similar rules apply to documents submitted to intersessional workshops.

5.1 Types of documents

The Scientific Committee receives and writes several types of documents and reports. These are summarised briefly below. All papers are publicly available in the Secretariat's archives although some have conditions on citation (see Item 5.2). For financial and environmental reasons, primary papers are distributed wholly electronically on the IWC website. Only sub-group chairs and rapporteurs may request hard copies from the Secretariat during the course of the Committee meeting.

The categories of documents received by the Scientific Committee are as follows:

1. National Progress Reports; (read more...)[DROP DOWN BOX]
   National Progress Reports have their origin in Article VIII, Paragraph 3 of the Convention. All member nations are urged by the Commission to provide Progress Reports to the Scientific Committee following the most recent guidelines developed by the Scientific Committee and adopted by the Commission. The report is intended as a concise summary of the cetacean research undertaken in member countries as well as a summary of information on direct and incidental anthropogenic mortality. An online submission system has been developed. Country representatives are informed directly on how to use this facility. For further information contact IT Support

2. SC Primary Papers; (read more...)[DROP DOWN BOX]
   Primary scientific papers (not 'For Information' papers – see below) and discussion documents on Scientific Committee processes should be submitted to the Committee following an agreed template and style. Authors are requested to submit at least preliminary titles, authors and ideally an abstract about seven weeks before the meeting to be reviewed and approved or otherwise by the Convenor for inclusion in the relevant subgroup's agenda. Approved Primary papers must be submitted (using an online submission system) by the end of the first day of the Annual Meeting. Under special circumstances, the Chair in consultation with the Vice-Chair, Head of

Science and relevant Convenor may either extend this deadline or agree to upgrade a working paper (see point 4 below) to the status of a Primary paper and allocate a document number.

Papers are allocated document numbers and categories by the Secretariat. Table 5 presents examples of categories of papers.

Table 5: Categories of Primary papers presented to the Scientific Committee (last updated: May 2018)

Category	Title	Description
ASI	Abundance estimates, stock status and international cruises	Papers on abundance estimates, stock status and international cruises
AWMP	Aboriginal Whaling Management Procedure	Papers mainly relevant to the AWMP, the Greenlandic Research programme and aboriginal subsistence whaling by Greenland and St. Vincent and The Grenadines
CMP	Conservation Management Plans	Papers relevant to cetacean stocks subject to CMPs or proposed as CMP candidates.
E	Environmental Concerns	Papers mainly relevant to environmental concerns
EM	Ecosystem Modelling	Papers relevant to the Ecosystem Modelling working group
HIM	Non-deliberate Human-Induced Mortality of cetaceans	Papers mainly relevant to the issue of estimation of accidental Human-Induced mortality rates, particularly bycatch and ship-strikes.
IA	In-depth Assessments	Papers mainly relevant to Antarctic minke whale assessments, SOWER cruises, IWC-DESS, sperm whales
NH	Northern Hemisphere whale stocks	Northern Hemisphere whale stocks not subject to hunts or CMPs
PH	Photo-id catalogues	Papers relevant to IWC Photo-id catalogues and related initiatives
RMP	Revised Management Procedure	Papers relevant to general RMP matters and Implementations or Implementation Reviews
SAN	Sanctuaries	Papers relevant to the discussion on new proposals on IWC Sanctuaries or containing information on existing Sanctuaries.
SCP	Scientific Committee Process	Papers relevant to the working methods of the Scientific Committee including improvements to the review process for Scientific Permits and Sanctuaries
SD&DNA	Stock Definition and DNA testing	Papers mainly relevant to Stock Definition, including general stock identity issues and those related to the issue of DNA testing
SH	Southern Hemisphere assessments	Papers mainly relevant to the assessment of Southern Hemisphere whales stocks not subject to hunts and CMPs
SM	Small Cetaceans	Papers mainly relevant to small cetaceans
SP	Special Permits	New information on special permits programmes, review papers and response papers
WW	Whale watching	Papers mainly relevant to whale watching

Submission of Primary papers does not preclude publication in peer-reviewed scientific journals (or indeed elsewhere), although they reside in the Secretariat, are publicly available on request and are considered part of the public domain. The Committee has agreed that authors may put the following text on the title page of their manuscripts – it will automatically be put on the website downloads pages for Primary papers: '*Papers submitted to the IWC Scientific Committee are produced to advance discussions within that Committee; they may be preliminary or exploratory. It is important that if you wish to cite this/a paper outside the context of an IWC meeting, you notify the author at least six weeks before it is cited to ensure that it has not been superseded or found to contain errors*'.

3. For Information Papers; (read more...)[DROP DOWN BOX]

This category is for papers that (a) have been submitted to a journal, (b) are in press, (c) have been published, or (d) have been submitted to another meeting (IWC or elsewhere).

4. SC Working Papers; (read more...)[DROP DOWN BOX]

Working papers are intended to expedite resolution of disagreements or stimulate debate within the meeting. They are only distributed with the agreement of the chair of a sub-group or the Scientific Committee Chair for plenary sessions. Recognising that such papers are often written at the last minute in order to stimulate discussion or present the results of a preliminary analysis which subsequently the author feels (or is told) is flawed, it has been agreed that they officially disappear at the end of the meeting. Working papers containing substantive or lengthy

contributions may be upgraded to a Primary paper (see point 2 above) or appended to the Committee or sub-group reports with the author's permission, and with the agreement of the Scientific Committee Chair and Vice-Chair, in consultation with the Head of Science. Any working paper that forms the basis of management advice must be appended to the appropriate report. Non-appended working papers have no status once the meeting is closed and thus cannot be cited in Primary papers or publications (or the report of the Committee or one of its sub-groups).

When considering whether to upgrade a working paper to a Primary paper, the Chair and Vice-Chair, in consultation with Head of Science will apply the following criteria:

1. the working paper has been presented and discussed within a sub-group or during the Plenary, such that there has been the opportunity to comment on it; and
2. the text of the sub-group or plenary report would be significantly improved, streamlined or clarified by the ability to reference the paper as a Primary paper.

5. SC Reports (including sub-groups/workshops). (read more...)[DROP DOWN BOX]

The Scientific Committee report is the public face of the work of the Committee. It has to serve a number of functions providing a concise yet comprehensive account of the scientific work undertaken for the benefit of (1) the participants; (2) scientists not attending the meeting; and (3) the Commission.

The Scientific Committee report and its Annexes (primarily the work of the sub-groups) is extensive, comprising in some years over 600 published pages in the IWC's *Journal of Cetacean Research and Management* (previously in *Rep int Whal Commn*). A primary component of the Plenary report is a summary of the work of the sub-groups. When reporting the work of the sub-groups each sub-group Chair provides a draft of what could comprise the main Committee discussions of those topics. The Head of Science may edit those draft reports into a format consistent with the reports of the Committee. While it is not common for the Plenary session to radically alter conclusions reached in sub-groups, this can happen. As noted above (Item 4), the Plenary is the ultimate body to decide the Committee's view.

In terms of reporting, if the Plenary as a body disagrees with the conclusions of a sub-group, this is handled quite simply by (1) explaining the reasons for this in the Plenary report and (2) including a footnote to the relevant section of the sub-group report.

However, at various times in its history, the Committee has struggled with how to deal not with major changes by the Committee but rather with comments by an individual or small group of individuals. The concern has been that by including such comments in the full Plenary report, they are effectively given far greater weight than similar comments made in the sub-group itself.

Given this, in 2004, the Committee agreed that:

1. every attempt is made to achieve consensus on sub-group conclusions and recommendations – in particular sufficient time must be made available for a full presentation to the Committee of major issues in a sub-group report (e.g. development of a new *SLA*, provision of catch limits, modifications to annotations to the RMP);
2. if the Chair rules that there is insufficient time to debate an issue, this must be clearly stated before discussion starts or during the discussion and reflected in the Plenary report;
3. general discussion that does not alter sub-group conclusions or recommendations shall be briefly reported along the lines of 'There was additional discussion of the conclusions/recommendations but the Committee endorses the view of the sub-group.'
4. statements under individual names should not be allowed in the body of the report but they may request to have a statement included in a 'Minority Annex' – the Plenary report will merely record that 'a minority statement (or statements) is (are) given in Annex Z.'
5. if the general discussion results in the Committee being unable to agree as a body to a conclusion /recommendation, the report will reflect the discussion with a brief rationale under 'Some…. Others …Yet others' culminating with a statement that 'under such circumstances, the Committee was unable to endorse the sub-group conclusion/recommendation.'

Full guidelines on intersessional meetings arrangements, including writing of reports, is given in Chapter 6 of Annex 1.

5.2 Style of sub-group reports

Sub-group reports need to be:

(1) concise and comprehensible both to people who attended the meeting and people who did not; and
(2) as complete as possible (including references and artwork) by the end of the meeting as the Scientific Committee Chair and HoS will have only two weeks after close of meeting (see Commission Rule of Procedure M.5) to finalise the full Committee report (including sub-group reports as Annexes) for distribution to Commissioners and Contracting Governments. This will have the additional benefit of allowing the published version (as published in the *Journal of Cetacean Research and Management*) to be completed more quickly.

Since 2016, the Committee's advice, agreements, recommendations and conclusions are written according to a standard format, which helps in highlighting and identifying them, the primary intended recipients (of course it is recognised that in a general sense, the whole report provides advice to the Commission) and the context in which they generated. See below for more details.[DROP DOWN BOX]

5.2.1 General style of sub-group reports

General guidelines for rapporteurs have been developed and full details can be found here (Annex 1: Chapter 6).

The sub-group agenda are used to form the outline of the report, but additional sub-items can be inserted if this improves the clarity of the report.

The text of the report is not a verbatim or quasi-verbatim record. As a general approach, rapporteurs need to write a good, logically structured 'essay' on the topic of the agenda item, based on the discussions, irrespective of the order in which comments were made.

Individuals' names should be avoided, unless someone specifies that they would like a particular statement attributed to them or there is no general agreement on a given issue.

Sub-groups are referred to in the past tense, including their recommendations and agreements. **Bold** should be used when the sub-committee has **agreed** on, or **recommended** something.

Authors must provide brief summaries of their papers, which will be edited for consistency and style, and to keep a fair balance. It must be clear where an author's summary ends and the sub-group discussion begins. For complex or controversial discussions, the relevant parts of the draft report should be shown to the relevant participants before being inserted in the draft report.

5.3 Advice, recommendations and conclusions

Important action items, such as agreements and recommendations, are highlighted by placing them in boxes. These boxes include the code of the primary intended recipients, text providing the context in which the advice, agreement, recommendation or conclusion arose, followed by the actual advice, agreement, recommendation or conclusion. See examples here[DROP DOWN TEXT]:

The first row of the box provides the code of the primary intended recipients (SC=recommendation internal to the Scientific Committee, G=general scientific recommendation; C-A=advice to the Commission; C-R=recommendation to the Commission; CC=recommendation relevant to the Conservation Committee; AWS= recommendation relevant to the Commission's Aboriginal Subsistence Whaling sub-committee; CG-A=advice to a contracting government or governments; CG-R=recommendations to a contracting government or governments; G-R=recommendations to a non-contracting government or governments; S= recommendation relevant to the Secretariat).

Attention: [intended audience:]*SC, C-A* [context:] *The Committee has completed the* Implementation Review *of North Atlantic common minke whales.* [agreement/advice:] *Based on the results of the* Implementation Simulation Trials*, the Committee* ***agrees*** *that variants 1, 3, 4 and 5 (see Item 6.1.2) are acceptable in terms of conservation performance. Of those, variant 5 achieves the best performance in terms of catch.*

Attention: [intended audience:] G, CG-R
[context:] The Committee welcomes the results of the long-term studies of gray whales in the wintering areas in the lagoons of Mexico and the northbound shore-based migration counts. [recommendation/advice:] It reiterates the importance of these long-

term studies and recommends that they continue, particularly for analyses of abundance and calf production in conjunction with environmental factors. Such analyses can provide general as well as specific insights on the population dynamics of whales in response to environmental factors.

Attention: [intended audience:] *G, CC*

[context and recommendation/advice:] *The Committee* ***recommends*** *that the work on dynamics of collisions between large ships and large whales, such as that in SC/67a/HIM16 continue, noting its potential to provide advice on mitigation measures. It also encourages the author to discuss with relevant stranding coordinators what type of data could be collected to help improve the models.*

5.4 Chair's overview of sub-group work

Following a Commission request, the Committee is constantly trying to improve its communication strategy. At the past two Commission's meetings the Scientific Committee Chair, Vice-Chair and Head of Science prepared a new document titled "Short overview of the work of the Scientific Committee at its 2015 and 2016 Annual Meetings" (see for example document IWC/66/17). These documents were greatly appreciated by Contracting Governments.

5.5 Distribution of reports

The Rules of Procedure deal with the availability of reports. In summary, the Annual Meeting report, Reports of Special Committee Meetings (and sometimes intersessional Workshops) are confidential until they are sent by the Secretary to the full Committee, Commissioners and Contracting Governments and/or made available on the website. Confidentiality applies to the 'outside' world and does not preclude Committee members from discussing the report with their Commissioners. Reports of intersessional Steering Groups or sub-groups are confidential until they have been discussed by the Scientific Committee, normally at an Annual Meeting.

The Scientific Committee occasionally agrees recommendations which include a request to the Secretariat to contact CGs, non-CGs or IGOs in order to raise specific concerns or offer assistance to tackle urgent matters. In years when the Commission meets, contact will be made by the Secretariat after the Commission's endorsement of these recommendations. Neither the IWC Secretariat nor any other IWC Committee or Working Group can send a letter to an individual Contracting Government independent from the Commission.

Members of the Scientific Committee should be aware of these restrictions and potential solutions.

6. RESEARCH FUNDS

Each biennium, the Commission approves a research budget for the Scientific Committee for activities that the Committee believes are essential to its work in providing the best scientific advice to the Commission (Financial Regulations Rule C, SC RoP G.1, G.3). This includes *inter alia* Workshops (see Item 4), data processing, data collection and collation (SC RoP H), analyses and the costs of inviting experts to annual and intersessional meetings (see Item 3.1). Read more here.

All research funds have an allowance for dealing with contingencies and emergency situations. See Table 6 for more detail on this matter. Reports on all funds (i.e. Research fund and Voluntary funds; see Table 6) are submitted annually to the Scientific Committee Plenary. All relevant information on their balance, including necessary adjustments, is reported to the Commission via the Committee annual report.

Table 6: Summary of Funds available to support Scientific Committee activities and relevant coordinating bodies

Fund name	*Fund coordinating body*	*Contingency fund per year*	*Contingency fund coordinating officers*
Research Fund	SC plenary, Convenors, HDs	10% [under consideration]	SC Chair and Vice-Chair, relevant convenors, Head of Science/Secretary
Voluntary Fund for Small Cetaceans' Research and Conservation	SM Review group	10% [under consideration]	SM Review group: SC Chair and Vice-Chair, SM Convenor/s, IWC Head of Science, and a number of competent SC members who provide a wide geographical scope and relevant expertise

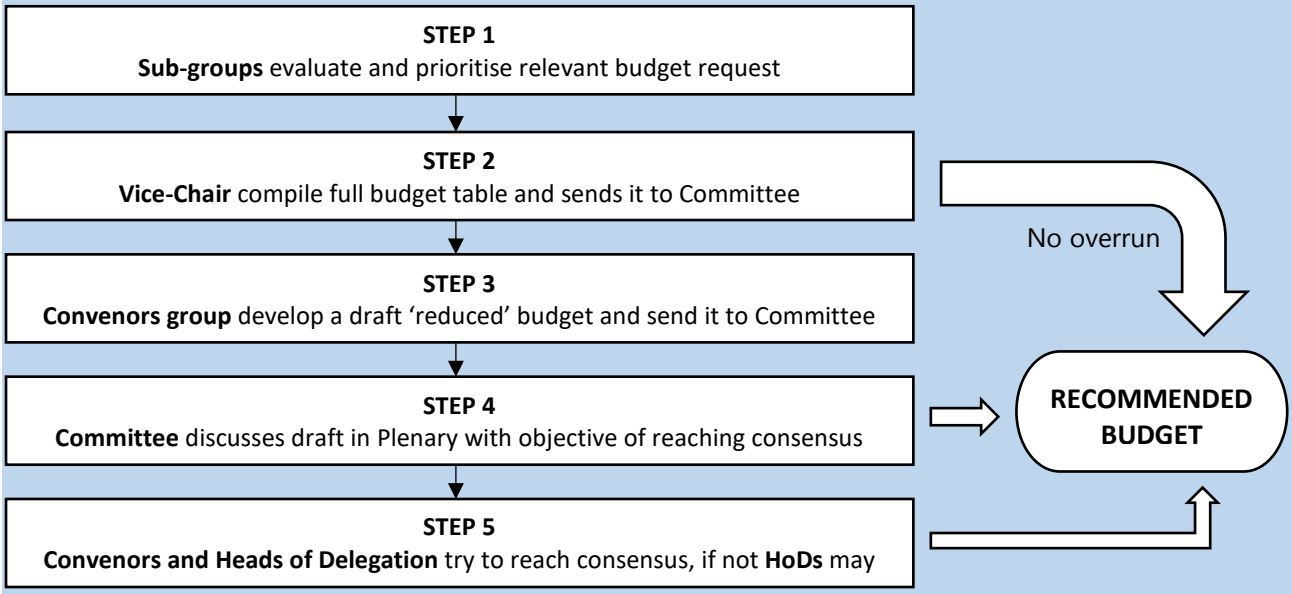
Voluntary Research Fund on Southern Ocean Research Partnership	IWC-SORP Scientific Steering Committee (SSC), IWC-SORP Assessment Panel	15,000	IWC-SORP SSC: a representative, with technical expertise, nominated by each member nation of the Partnership, SH Convenor/s o, SC Chair, IWC Head of Science, IWC-SORP Secretariat and CCAMLR observer to IWC Scientific Committee.
Voluntary Fund for Aboriginal Subsistence Whaling	SC plenary, Convenors, HDs	None	SC Chair and Vice-Chair, relevant convenor, Head of Science/Secretary

6.1 Scientific Committee projects and activities

Most of the research supported by the IWC arises from discussions at Annual Meetings of the Committee. However, the Committee can accept applications developed by sub-groups for funding for research projects, the objectives of which are to advance the work of the Committee following a *pro forma* given here (Annex 1: Chapter 5). In years when the Commission meets, the Committee develops an overall budget summary document including a short summary of the objectives of each proposed item for funding, as part of the Committee's report. (read more…)[DROP DOWN BOX]

At present, the annual research budget is about £315,800. Details can be found in the Scientific Committee report.

In 2015 the Committee finalised a new approach to Improve the Scientific Committee's process for developing a consensus Budget recommendation to the Commission, which was endorsed in 2016. This new procedure is usually applied in years when the Commission meets and includes the following steps:



Step 1: Sub-groups evaluate, prioritise and rank each budget request/proposal

The precise mechanism for doing this is the responsibility of the individual sub-groups and their report will explain their approach as well as the result. Each request to the sub-group is filled in the appropriate *pro forma* (here), which includes information on objectives, relevance to work of the Scientific committee and its relevant sub-group, methods, deliverables, work plan, budget breakdown, in-kind support, etc.

Prior to submission of a project with a budget exceeding £20,000 the proponent should consult with the Chair, Vice-Chair and Head of Science to receive guidance, for example, on the relevance of the project to the Scientific Committee, the appropriateness of the budget, the likelihood of success.

The evaluation and prioritisation process should be initiated as early as possible within the sub-group. Whatever mechanism is agreed by the sub-group it should consider factors such as conflict of interest. Caution should also be used for projects proposed by active members of the Scientific Committee. The Scientific Committee should have in place safeguards to ensure all proposals are subject to equal scrutiny and challenge. This will maintain the integrity of the Scientific Committee by ensuring necessary transparency in the handling of possible conflicts of interest. The use of the agreed evaluation criteria (or scoring/prioritisation sheet) helps to ensure this. There is also the possibility of the Convenor, in consultation with the sub-group, requesting the process be completed anonymously by all members of

the group, particularly for controversial cases. In general, proponents should be asked to leave the room when their proposal is discussed.

The evaluation process to prioritise proposals is conducted using the ***agreed evaluation criteria*** (here) and considers such factors as relevance to work of the sub-group, likelihood of success, value for money, timeline etc. Please note that not all projects with a good/sufficient score can be funded nor is the arithmetic ranking fully reflected in the final funding decision. The final decision is taken on the basis of a thorough and fair discussion beyond that of the simple scoring process. The prioritisation process should occur towards the end of the sub-group meeting, so that it can be considered in terms of factors such as the sub-groups two-year work plan and the Scientific Committee's two-year budget. Where appropriate it may also consider the outcomes of previous similar or related proposals or proposals by the same authors/groups. The sub-group may decide to comment on implications of delaying some proposals or parts of some proposals. Where proposals are not deemed worthy of funding or considered a priority at this time by the sub-group, the rationale will be given.

Proponents together with the sub-groups shall also consider possibilities to reduce budgets in light of the necessity of cuts being made during the following steps, especially considering the two-year period. The sub-group report will contain a short summary of all of the proposals, evaluation, costs and ranking. The full *pro formas* are also made available to the full Committee by the Secretariat. A table summarising all budget requests will be included at the end of each sub-group report and also sent directly to the Vice-Chair.

Step 2: Scientific Committee Vice-Chair, Chair and Convenors
The Vice-Chair (in conjunction with the SC Chair and convenors) compiles an overall budget summary document including a short summary of the objectives of each proposed item for funding. If the total does not exceed the expected budget available and each item meets the required scientific, administrative and logistic standards (Chair and Convenors will briefly reconsider all proposals), the total budget shall be provided to the Committee for its final approval.

If there is an overrun the Chair informs the Committee immediately and moves to Step 3.

Step 3: Reduced Budget
The Chair and Convenors develop a draft Reduced Budget by considering inter alia:

(1) implications of delaying funding for a particular project;
(2) implications for future years' budgets (beyond the current two-year process): long-term projects that are likely to require ongoing funding should be clearly identified;
(3) implications for the overall work of the Scientific committee;
(4) any expected wider benefit of funding overall commission objectives; and
(5) decisions from previous years (consideration is to be given to meritorious proposals rejected/ postponed in a previous year, if their value is high in the new ranking).

Among equally important activities that suffer cuts, as good practice, cuts in different years should not pertain always to the same activities/sub-groups, but they should be equally spread in the long-term.

Step 4: Discussion on draft Reduced Budget in Plenary
This Reduced Budget is submitted to the full Committee as soon as possible (and no later than 6pm the day before it is to be discussed), along with an explanation for the proposed reductions. The draft Reduced Budget is discussed by the Committee no later than the morning of the last day of Plenary. Every effort should be made to reach consensus.

If consensus is reached, the Reduced Budget is included in the Committee's report and the process described (i.e. details are provided on why reductions where applied for each of the affected projects). A summary of the full set of submitted proposals is also included in the report.

If consensus cannot be reached then Step 5 will be followed.

Step 5: Chair and Convenors and Heads of Delegation
The Scientific Committee Chair, Convenors and Heads of Delegation reach a final decision, taking fully into account the discussions thus far. If consensus cannot be reached, Head of Delegations vote on a way forward and options are submitted to the Commission, and the rationale reported in the Committee's report.

However the agreement is reached, during presentation of the agreed budget to the Commission, a list of all the research/work proposals put forward to the Scientific Committee (with their associated ranking) will be available to the

Commission as an appendix to the budget documentation. In case of a cut to the recommended Scientific Committee budget by the Commission, the Scientific Committee Chair, Vice-Chair and Head of Science will proceed to cuts on lower priority activities (identified through this process).

6.1.1 Mid-term and final evaluation of the budget
A mid-term (i.e. after one year) and a final revaluation of the budget is necessary.

In the mid-term, the Chair, Vice-Chair, Head of Science and Secretary present the actual situation on activities completed and provide to the Scientific Committee a simple plan for covering any over expenditure or reallocation of any unspent funds.

The transfer of funds from one activity to another should be made in a way which maintains generally their original intent (e.g. workshop/meetings, research projects, modelling, databases, preparation of technical material for the website, etc.). For example, unspent funds previously assigned to the organisation of a workshop can be transferred to the organisation of another workshop during the same year or the year after. Where small sums are involved (up to £2,000) there may be more flexibility in changing categories to ensure an overall balanced budget.

In case of some foreseen activity that did or will not take place (e.g. modelling no longer useful or no longer possible due to the lack of appropriate experts), the Chair, Vice-Chair, and the Head of Science, in consultation with the Secretary, will propose alternate funding options taking into account the Scientific Committee priorities and projects, which were previously identified by the Scientific Committee, but not selected for funding. These options will be presented to the Scientific Committee for agreement. This concept applies to all research funds (see section 6.3).

6.2 Unsolicited research projects and activities (SC RoP G.2) [Note: There is a proposal for deleting this RoP. If the proposal is accepted, this section will be removed from the SC HB]
In addition, the Committee may consider and accept outside research proposals (i.e. those which are not generated through the Committee's own work) following the same pro forma and evaluation process of Committee's proposals (section 6.1). Unsolicited projects must be to be submitted to the Secretariat (secretariat@iwc.int) at least four calendar months prior to the annual Committee meeting where they will be considered.

6.3 Voluntary research funds (Financial Regulations Rule C and its Appendixes 1 and 4)
There is also a Voluntary Fund for Small Cetaceans Conservation Research (https://iwc.int/sm_fund), a Southern Ocean Research Program (SORP) Fund (https://iwc.int/sorp) and a Voluntary Fund for Aboriginal Subsistence Whaling), which are assigned and managed through specific procedures. All proposed disbursements need to have the Scientific Committee's recommendation and the Commission's endorsement before they become active. See Annex 1: Chapter 5 to this document for all relevant pro-forma and criteria. [On web page too, or text to be here only?]

7. PROCESS FOR REVIEW OF SCIENTIFIC PERMITS
Article VIII of the Convention allows governments to issue special permits to their nationals to take whales for scientific research. The Schedule (Para. 30) provides for the Scientific Committee to review and comment on them (see also SC RoP F).

Although the Scientific Committee and the Commission itself can comment on proposed permits, the final decision over content and numbers of animals resides with individual Contracting Governments. The issue of scientific permit whaling has become increasingly controversial within the Commission as has the question of the review of scientific permit proposals and results.

All proposed permits have to be submitted for review by the Scientific Committee following Guidelines adopted by the Commission (Annex 1: Chapter 4). (read more…)[DROP DOWN BOX]

The Scientific Committee's review has concentrated on the following issues, whether:

- the permit adequately specifies its aims, methodology and the samples to be taken;
- the research is essential for conservation and management, the work of the Scientific Committee or other critically important research needs;
- the methodology and sample size are likely to provide reliable answers to the questions being asked;
- the questions can be answered using non-lethal research methods;
- the catches will have an adverse effect on the stock;
- there is the potential for scientists from other nations to join the research programme.

The Committee inevitably includes the scientists who are proposing the permit and the usual way that the review was carried out was for all scientists to be present for discussions although the comments of the proposers and the rest of the Committee are identified in the report. As one might expect with such a large group of scientists, the review of any permits rarely resulted in unanimity either in favour or against the scientific merit of the proposal. The published reports of the Scientific Committee have reflected the agreements and disagreements of the review process, for both new and continuing permits (e.g. *Journal of Cetacean Research and Management* (Suppl.) 10, pp.341-42; *Journal of Cetacean Research and Management* (Suppl.) 11, p.64).

In 2009, in an attempt to improve the review process for both new permit proposals and periodic review of results of ongoing or completed programmes, the Committee proposed a new approach (traditionally known as the 'Annex P' process because Annex P was where it was first specified) that was accepted by the Commission. The primary change involved the initial review of a new proposal, or interim and final reviews of permit programmes at a small specialist workshop with a 'limited but adequate' number of invited experts (The 'Expert Panel') who may or may not be present members of the Scientific Committee. A limited number of scientists associated with the proposal can attend the workshop in an advisory role, primarily to present the proposal and answer points of clarification and not to participate in the discussion of the Panel. The practical way this was implemented at the first meeting this process (a mid-term review of the JARPN II programme) was that proponents provided brief presentations of their documents to the Panel in the morning session and answered questions of clarification; for the rest of the day the Panel was left alone to discuss the results and develop its report. In addition, Scientific Committee members are allowed to submit documents/analyses and attend open sessions as observers. Since 2009 the Annex P has been improved few times; all versions have been agreed by consensus. The most recent version of this detailed process is given here. The report of Expert Panel, along with comments made upon it by the Scientific Committee at its Annual Meeting, are submitted to the Commission.

8. DATA AVAILABILITY PROCEDURES

The Scientific Committee uses a very large amount of data to provide the best advice to the Commission. Some of these data are provided by Member governments to the IWC as a requirement under the Convention/Schedule. These data are held and administered by the Secretariat. Other data are provided by or can be made available from governments, other organisations and individuals. The availability of data has sometimes proved to be a complex and sensitive issue.

8.1. Data Availability Agreement

Recognising that a balance must be struck between the needs of the Scientific Committee and the rights of the scientists who have invested considerable time and effort in collecting the data, the Scientific Committee has formulated a Data Availability Agreement overseen by a Data Availability Group (DAG) comprising the Chair and Vice-Chair of the Committee and the Head of Science.

Primary Contact and correspondence should be with the Vice-Chair (sc.vice-chair@iwc.int). Copies should also be sent to the Chair of SC (sc.chair@iwc.int) and the Head of Science (head.science@iwc.int; greg.donovan@iwc.int).

There are two data availability procedures:

1. **Procedure A** applies to data required for the RMP, AWMP and to provide advice on aboriginal subsistence whaling catch limits before the relevant SLAs have been completed.
2. **Procedure B** applies to data required for analyses deemed important in providing advice to the Commission other than catch limits (e.g. on the status of stocks not subject to IWC regulated whaling).

The full Rules are downloadable here (Annex 1: Chapter 3.1) and you can read more on the full process (here[DROP DOWN BOX]).

8.1.1 Deadlines

Under Procedure A, there are deadlines for papers using those data to be submitted to the Scientific Committee (Table 7).

Table 7: Tentative deadlines under Procedure A

Type of paper	Time before the first day of Scientific Committee Plenary and *Implementation Reviews* Intersessional meetings
Final datasets available	6 months
Papers using novel methods	3 months

Papers using standard methods	2 months
Papers responding to those above	1 month

8.1.2 Datasets

Summary lists of the data available can be downloaded from Table 8. Applications for such data shall be copied to the DAG.

Table 8: Summary lists of the data available

Subject
western North Pacific common minke whales (2012)
Genetic data for the *Pre-Implementation Assessment* (Japan)
Genetic data for the *Pre-Implementation Assessment* (USA)
Genetic data for the *Pre-Implementation Assessment* (Korea)
Sightings data for the *Pre-Implementation Assessment* (Japan)
Sightings data for the *Pre-Implementation Assessment* (Korea)
western North Pacific common minke whales (2018)
Genetic data for the *Pre-Implementation Assessment* (Japan)
Eastern North pacific gray whales (2012)
Summary of data for the 2012 *Implementation Review*
Bering-Chukchi-Beaufort Seas stock of Bowhead whales (2012)
Summary of data for the 2012 *Implementation Review*
Bering-Chukchi-Beaufort Seas stock of Bowhead whales (2018)
Summary of data for the 2018 *Implementation Review*

8.1.3 Applications

Applications made under Procedure A should be made to the contact persons identified in the summary files provided above and copied to the DAG. Applications made under Procedure B should follow the protocols provided below (if no Protocol is listed contact the DAG).

8.1.4 Protocols

At present, these are the agreed protocols for approaching the following bodies for data available under Procedure B (Table 9). Right click link and choose 'Save target as..' to download.

Table 9: Lists of the available protocols for data access

Title	*Link*
Protocol for access to samples/data from the Institute of Cetacean Research (ICR), Tokyo, Japan (JCRM 6 (suppl.): 56-7	ICR
Protocol for access to samples/data from the Cetacean Research Center (CRC), National Fisheries Research and Development Institute, Korea, (JCRM 6 (suppl.):57)	CRC
Protocol for access to data from the University of Auckland	UAuckland
Protocol for access to samples/data from the National Research Institute of Far Seas Fisheries (NRIFSF), Fisheries Research Agency, Japan, for data availability (JCRM 6 (suppl.):57)	NRIFSF

8.1.5 Agreements

For the successful operation of the agreement, certain conditions must be met that ensure the rights of the data holders as detailed in the Rules available (see 8.1.3, 8.1.4 and Annex 1: Chapter 3.1.6). An example of the standard agreement letter can be downloaded here.

8.1.6 Report on data availability requests

The Data Availability Group reports annually to the Committee on all received requests for data access and their outcome.

8.2 Other available datasets outside the Data Availability system

In addition, the Committee has procedures to consider applications for the use of acoustic data, tissue samples or photo-identification photographs collected in IWC research programmes (i.e. SOWER and POWER, SORP and other IWC

datasets), outside the Data Availability system. An example of the user proposal form for SOWER and POWER data can be downloaded here (Annex 1: Chapter 3.2, 3.3). The POWER Cruise Steering Group reviews these proposals. Data Availability procedures for SORP data can be found here (http://www.marinemammals.gov.au/sorp; https://iwc.int/sorp).

At its Annual Meeting, the Committee receives a full report on the outcome from all data access request from the DAG and from the Secretariat.

9. SCIENTIFIC WORK

The Scientific Committee covers a wide range of scientific subjects related to the conservation and management of cetaceans, such as the Revised Management Procedure, Aboriginal Whaling Management Procedure and in-depth ('comprehensive') assessments, environmental concerns, DNA, whale watching, small cetaceans and Conservation Management Plans.

Table 10: AWS and RMP *Implementation* and *Implementations Reviews* [this table needs periodic updates]

AWS Hunt	Year *SLA* developed (IRs completed)	Next *Implementation Review*
Alaska and Chukotka bowhead	2000 (2007, 2012)	Start 2018
Chukotka gray/Makah gray	2001 (2010, 2012)	Start 2019
West Greenland humpback	2014	Start 2020
West Greenland bowhead	2015	Start 2021
West Greenland fin	2017/18 est.	2023 estimated
West Greenland/East Greenland common minke	2018	2024 estimated
RMP Stock	**Year *Implementation* (IRs) completed**	**Next *Implementation Review***
North Atlantic (NA) common minke whales	1993 (2003, 2008, 2017)	Start 2022
Western North Pacific (WNP) common minke whales	2003 (2013)	Start 2018
WNP Bryde's whales	2007	Start in 2017
NA fin whales	2009 (2016)	Start 2023
Antarctic minke whales	1992 (no *Implementation Reviews* have occurred since, given the adoption of the Southern Ocean Sanctuary in 1994)	

With respect to whale stocks, the approaches differ depending on the nature of actual or potential direct exploitation and indirect exploitation. The objective for aboriginal subsistence whaling is for *Strike Limit Algorithms* to be developed for all stocks by 2018 (this work is on track with two *SLA*s left to be completed for the Greenlandic hunts). There is a system of regular (5-6 year) *Implementation Reviews* with established guidelines (Table 10). Similarly, those stocks that might be subject to whaling under the RMP follow a formally documented approach with established Requirements and Guidelines (*pre-Implementation Assessment, Implementation, Implementation Review* every 5-6 years; Table 10; Annex 1: Chapter 2.1 and 2.3). The RMP *pre-Implementation Assessment* for new species/populations is usually preceded by an in-depth assessment.

The Committee has no formal guidelines for assessing the effect of special permit catches on stocks, but has agreed that it should normally follow a similar modelling approach to that used for AWMP and RMP with respect to modelling potential effects in light of uncertainty. In 2016, the Committee agreed to start drafting guidelines in this area.

For stocks not subjected to direct hunting by contracting governments, the Committee has followed an 'in-depth' assessment approach (Table 11). Table 11 provides a short summary of the Committee's work on whale stocks. A similar table will be constructed for small cetaceans by 2020. At present, this is less formal (and has no timeline) and takes into account the available information and uses modelling to establish the status of the population(s) i.e. where the population is now compared to its pre-exploitation state and what are the current trends are. This follows a similar approach to the RMP in that there is a pre-assessment evaluation of the available information to see if it is sufficient to carry out an in-depth assessment. Once an assessment is completed it is revisited when sufficient new information is available to warrant it.

Table 11: Current assessment/management status of large whale stocks and SC sub-groups responsible

Species	Region	Assessment/Management Status	Sub- Group
Blue whale	North Pacific	Pre-In-Depth Assessment	NH
	North Atlantic	No assessment plans at present. Receive new information	NH
	Southern Hemisphere	Antarctic wide in-depth assessment completed. Investigation to see if smaller scale in-depth assessment feasible	SH
Sei whale	North Pacific	Ongoing *In-Depth Assessment*. Subject of Special Permit whaling	IA/SP
	North Atlantic	Request for RMP *Implementation* postponed. Receive new information	NH
	Southern Hemisphere	No assessment plans. Receive new information.	SH
Fin whale	North Pacific	No assessment plans. Receive new information.	NH
	North Atlantic	*Implementation Review* completed. Subject of whaling under reservation	RMP
	West Greenland hunt	SLA being developed. Subject of Aboriginal Subsistence Whaling	AWMP
	Southern Hemisphere	Examining feasibility of undertaking in-depth assessment. Receive new information.	SH
Omura's Whale	Indian Ocean, north and central west Pacific	No assessment plans. Receive new information.	NH
Gray whale	North Pacific	Rangewide review in progress	CMP
	western	Subject of Conservation Management Plan	CMP
	Chukotka, Makah hunts	*SLA* developed. Next *Implementation Review* expected in 2019. Subject of Aboriginal Subsistence Whaling	AWMP
Common minke whale	North Pacific	Other than outlined below, no assessment plans. Receive new information.	NH
	Western	Next *Implementation Review* expected in 2019. Subject of special permit whaling	RMP/SP
	North Atlantic	Other than outlined below, no assessment plans. Receive new information.	NH
	central and eastern	Complete *Implementation Review* in 2017. Subject of whaling under objection	RMP
	East Greenland	*SLA* being developed. Subject of Aboriginal Subsistence Whaling	AWMP
	West Greenland	*SLA* being developed. Subject of Aboriginal Subsistence Whaling	AWMP
	Southern Hemisphere	No assessment plans for dwarf minke whales. Receive new information	SH
Antarctic minke whale	Southern Hemisphere	Assessment recently completed. Subject of Special Permit whaling	IA/SP
Bryde's whales	North Pacific	Other than outlined below, no assessment plans. Receive new information especially from IWC-POWER	NH
	Western	*Implementation Review* starting in 2017. Was subject of Special Permit whaling until 2016	RMP/SP
	North Atlantic	No assessment plans. Receive new information.	NH
	Southern Hemisphere	No assessment plans. Receive new information.	SH
Right whale	North Pacific	No assessment plans. Receive new information.	NH
	North Atlantic	Other than outlined below, no assessment plans. Receive new information.	NH
	Western	New assessment required.	IA
	Southern Hemisphere	Assessment recently completed. Receive new information	SH
	SE Pacific, South Atlantic	Two populations subject of Conservation Management Plans	CMP
Bowhead whale	North Atlantic	Other than outlined below, no assessment plans. Receive new information.	NH
	Greenland hunt (and Canada)	*SLA* developed. Subject of Aboriginal Subsistence Whaling (also by Canada - a non-member nation)	AWMP
	North Pacific		
	Bering-Chukchi-Beaufort Seas	Subject to Aboriginal Subsistence Whaling	AWMP
	Okhotsk Sea	*SLA* developed. Next *Implementation Review* expected in 2019. Subject of Aboriginal Subsistence Whaling	NH
Humpback whale	North Pacific	Subject to *In-Depth Assessment* (P-IA)	IA
	North Atlantic	Due a new assessment (last one completed in 2002). Receive new information.	NH
	West Greenland hunt	Subject of Aboriginal Subsistence Whaling	AWMP
	St. Vincent and The Grenadines	Subject of Aboriginal Subsistence Whaling	AWMP
	Southern Hemisphere	Assessment recently completed. Receive new information	SH
	Arabian Sea	Proposed for Conservation Management Plan	CMP
Sperm whale	Global	Reviewing assessment plans. Receive new information	IA

9.1 Cooperation with other organisations

The importance of collaboration with other international organisations is well recognised and encouraged on many issues including bycatch, ship-strikes, environmental concerns, small cetaceans, ecosystem modelling, etc.

9.2 General assessment issues and Revised Management Procedure

The Sub-committee on the Revised Management Procedure considers general assessment issues generated from the RMP discussions (or those from other sub-groups e.g. AWMP, IA) such as: (1) the relationship between $MSYR_{mat}$ and

$MSYR_{1+}$; (2) text for the 'requirements and guidelines for conducting surveys' e.g. with regard to model based abundance estimates; (3) implications of RMP and AWMP simulation trials for consideration of 'status'; and (4) matters of relevance to special permits that involve RMP considerations including effects of catches upon stocks.

In addition, this sub-committee is in charge of assessment of whale stocks subject to RMP or Special Permits: (1) ongoing *Implementation Reviews* (see Table 10), and (2) preparation of new *Implementation Reviews* (e.g. North Pacific common minke whales). Items related to the stock structure and abundance of these stocks are dealt with by the sub-groups on SD&DNA and ASI, respectively. Issues related to specific special permits are dealt with by the RMP sub-committee and included under Item 'Special Permits' of the main Scientific Committee report. See full details on the RMP here (https://iwc.int/rmp).

9.3 Aboriginal Whaling Management Procedure and stocks subject to Aboriginal Subsistence Whaling including management advice

The Standing Working Group on the Aboriginal Whaling Management Procedure (AWMP) is in charge of: (1) completing and updating the Aboriginal Subsistence Whaling Management Procedure (completion and updating of SLA for all hunts, and conducting *Implementation Reviews*; Annex 1: Chapter 2.2 and 2.5); and (2) provide annual advice on stocks subject to Aboriginal Subsistence Whaling (ASW; https://iwc.int/aboriginal) hunts - Greenland hunts for common minke, fin, humpback and bowhead whales, Chukotka hunt for gray whales, potential Makah hunt for gray whales, Alaska and Chukotka hunts for bowhead whales, St. Vincent and The Grenadines hunt for humpback whales. Items related to the stock structure and abundance of these stocks are dealt with by the sub-groups on SD&DNA and ASI, respectively.

9.4 Whale stocks not subject to direct takes or to CMPs

Stocks not subject to direct takes (see Item 9.2 and 9.3) by contracting governments or to CMPs (see Item 9.5) are considered by three different sub-committees. They include (1) stocks in the process of (or final preparations for) an In-depth Assessment (IA); (2) Southern Hemisphere (SH) or Northern Hemisphere (NH) stocks for which a recent in-depth assessment has occurred or for which data are being assembled to see if an In-depth Assessment is feasible; and (3) the remaining Southern Hemisphere (SH) or Northern Hemisphere (NH) stocks for which there is limited information (which are not considered each year, nor each biennium). Efforts will be made to develop a longer-term strategy to assess all stocks. Items related to the stock structure and abundance of these stocks is dealt with by the sub-groups on SD&DNA and ASI.

9.5 Cetacean stocks that are or might be the subject of Conservation Management Plans

The Sub-committee on Conservation Management Plans (CMP; https://iwc.int/conservation-management-plans), with a focus on progress with scientific aspects, considers cetacean stocks that are: (1) the subject of existing CMPs (i.e. SE Pacific and S Atlantic southern right whales, North Pacific gray whales and Franciscana) or (2) are high priority candidates for a CMP (i.e. Humpback whales in the northern Indian Ocean including the Arabian Sea). It will also periodically reconsider stocks that have previously been considered as potential CMPs, recognising that the Commission has stressed the need for Range States to support any IWC CMPs (i.e. northern Indian Ocean Blue whales, Mediterranean Fin whale and Sperm whale, Boto in Amazonia). Items related to the stock structure and abundance of these stocks is dealt with by the sub-groups on SD&DNA and ASI.

9.6 Stock definition and DNA testing

The Working Group on Stock Definition and DNA testing (SD&DNA) reviews: (1) new papers on stock structure on behalf of other sub-groups (AWMP, CMP, EM, HIM, IA, NH, RMP, SH, SM and WW); (2) DNA testing matters including those related to DNA registries (Annex 1: Chapter 2.7); (3) guidelines for ensuring DNA data quality and for analyses of genetic data (Annex 1: Chapter 2.6); (4) general statistical and other issues related to stock structure matters using a suite of data and techniques; (5) terminology appropriate to stock definition, unit-to-conserve and 'viable' population for use across sub-groups and the Committee; and (6) population models to test spatial stock structure models.

As genetic data are frequently applied to give advice to the IWC (including, but not limited to, detection of population structure) there is a need to agree on data quality criteria for currently used DNA marker types (sequences, microsatellites, Single Nucleotide Polymorphisms [SNPs]; possibly nuclear DNA sequencing in the future). The guidelines and considerations on DNA quality provided here (Annex 1: Chapter 2.6) represent common practice subject to ongoing discussion and will need future adaptation, as the state-of-the-art of DNA analysis in population genetics progresses. It is also evident that, although accordance to these guidelines is highly desirable, this does not preclude consideration of

genetic work failing to fully meet these standards. For studies explicitly carried out to give stock definition advice to the IWC, adherence to these guidelines is strongly recommended.

9.7 Cetacean abundance estimates, stock status and international cruises

The Working Group on cetacean Abundance estimates, stock Status and International cruises (ASI) focuses on: (1) reviewing new abundance estimates on behalf of other sub-groups (AWMP, CMP, EM, HIM, IA, NH, RMP, SH, SM and WW), which are included in the Abundance summary table (LINK TO A WEB PAGE); (2) developing a biennial document compiling agreed abundance estimates including a basin wide summary (LINK TO A WEB PAGE) ; (3) methodological issues including model-based abundance estimates; (4) discussion on how to present information on the status of stocks (https://iwc.int/status) including a summary of information on the status of stocks based on completed in-depth assessments or RMP and AWMP *Implementations*; and (5) the design and analyses of IWC research projects related to abundance estimation including relevant IWC-SORP projects and IWC-POWER cruises (https://iwc.int/power), including Guidelines on survey design and techniques (Annex 1: Chapter 2.4).

9.8 Non-deliberate human-induced mortality of cetaceans

The Sub-committee on Non-deliberate Human-Induced Mortality of cetaceans (HIM) currently discusses: (1) entanglement of large whales (https://iwc.int/entanglement); (2) ship strikes (https://iwc.int/ship-strikes); (3) approaches for addressing the bycatch of small cetaceans (https://iwc.int/bycatch); and (4) relevant information submitted in National Progress Reports and evaluate its adequacy.

The Sub-committee addresses the assessment and scientific aspects of mitigation of non-deliberate mortality of cetaceans. The main focus is on large whale entanglement, bycatch of small cetaceans and ship strikes. The Working Group continues to consider methods to estimate mortality rates from these causes for use in the Committee's In-depth Assessments and *Implementation Trials*. The Sub-committee also contributes to the joint work programme of the Scientific and Conservation Committees, providing scientific views on aspects of the Commission's Ship Strikes Working Group and large whale disentanglement initiatives. The Working Group also considers scientific advice relevant to furthering cooperation between IWC and other international bodies including the International Maritime Organization. Specific topics that are considered by the working group include:

1. Bycatch and entanglement
   i. Review the information submitted by member countries in National Progress reports relevant to bycatch and entanglement;
   ii. Estimation of rates of entanglement, risks of entanglement and mortality for large whales and evaluate mitigation measures for preventing large whale entanglement;
   iii. Estimation of rates of bycatch, risks of, and mortality for small cetaceans including consideration of scientific aspects of bycatch mitigation measures and prevention;
2. Ship Strikes
   i. Review progress on developing a global data base of ship strike incidents;
   ii. Estimation of risks and mortality from ship strikes;
   iii. Consideration of methods to identify high risk areas;
   iv. Evaluate options to mitigate risk of ship strikes with a focus on identified high risk areas.

9.9 Environmental concerns

The Standing Sub-committee on Environmental Concerns (E; https://iwc.int/environment) focuses on a wide range of topics, including Pollution 2020, Oil spill impacts, cumulative impacts, harmful algal blooms, marine debris, diseases of concern, strandings and mortality events, noise, climate change.

9.10 Ecosystem modelling

The Sub-committee on Ecosystem Modelling (EM) covers topics including: (1) co-operation with CCAMLR, (2) several issues relevant to ecosystem modelling, including ensemble averaging, effects of long-term environmental variability, IBEMs and aspects of ecosystem services, and aspects of ecosystem services; (3) relevant aspects of Special Permits programmes; (4) spatial modelling and (5) review of ecosystem modelling developments outside the IWC.

9.11 Small cetaceans

The Sub-committee on Small Cetaceans (SM; https://iwc.int/smallcetacean) covers a wide range of topics. These are usually the following: (1) a focus on the annual priority species/stock/topic; (2) update on the Voluntary Fund for Small Cetacean Conservation Research (https://iwc.int/sm_fund); (3) review progress on previous recommendations where new

information is available (species only are periodically considered); (4) review takes of small cetaceans; (5) update on progress made on the topic of 'poorly documented hunts of small cetaceans for food, bait or cash.' Items related to the stock structure and abundance of these stocks are dealt with by the sub-groups on SD&DNA and ASI.

9.12 Whale watching

The Sub-committee on Whale watching (WW; https://iwc.int/whalewatching) focuses on scientific aspects of whale watching especially: (1) the impact of whale watching on cetaceans (Modelling and Assessment of Whale watching Impact, MAWI); (2) data collection and analytical techniques including use of platform of opportunity data; and (3) emerging concerns. It will also review progress on the Commission's 5-year strategic plan and joint work with Conservation Committee (Online handbook; 5-Year Strategic Plan for Whale Watching; General principles and guidelines, https://iwc.int/wwguidelines).

9.13 Special permits

The discussion on Special Permits (SP; https://iwc.int/permits) is carried out in special Plenary sessions. This item includes: (1) planning for Expert Panel workshops and review of reports from them in accordance with Annex P (new, ongoing or final); (2) reviewing progress with recommendations made by Panels and the Committee; (3) short reviews of updates from ongoing programmes; Detailed technical review of analyses/papers from special permits occurs in the relevant sub-groups of the Committee (EM, HIM, IA, NH, RMP and SH).

9.14 Whale sanctuaries

The Scientific Committee also has a Working Group on Sanctuaries (SAN) that, when necessary, carries out: 1) reviews of any new Sanctuary proposals, 2) scheduled reviews of existing Sanctuaries and 3) responses to requests from the Commission on scientific aspects of sanctuaries (https://iwc.int/sanctuaries).

9.15 IWC databases and catalogues

The IWC is increasingly acting as a repository of data (including genetic samples currently stored at the Southwest Fisheries Science Center, La Jolla, California). These databases and archives include: (1) the IWC catch database; (2) the National Progress Report database; (3) the IWC sightings database (IWC-DESS) which holds sightings and effort data from the IWC IDCR, SOWER and POWER cruises as well as data submitted under the RMP; (4) the IWC photographic archive for the IWC IDCR, SOWER and POWER cruises; (5) a number of photo-identification catalogues (e.g. Southern Hemisphere blue whales, Antarctic humpback whales, various species from IWC-POWER etc.); (6) the global ship strikes database and possibly other future databases (e.g. entanglements). Under this item the Committee addresses: (1) common guidelines and principles for IWC databases including data availability; (2) design issues and (3) provide a summary of holdings.

The *Ad hoc* Working Group on Photo-identification (PH) supports the IWC work conducting cetacean population assessments through photo-ID databases (catalogues of cetacean photo-identifications and associated geographical and biological data, including genetic data when applicable and appropriate). Specifically, this Working Group: (1) develops guidelines for catalogues contributing photo-ID data to IWC assessments and/or that are IWC funding recipients (Annex 1: Chapter 3.3); (2) reviews progress in archiving IWC photo-ID data for IWC IDCR, SOWER, and POWER cruises; (3) reviews ongoing species-specific catalogue developments (e.g. Antarctic humpback whales, Southern Hemisphere blue whales); (4) supports the collaboration of photo-ID catalogues in order to integrate databases as an underpinning of cetacean population assessments.

In 2017 the Committee established with the Secretariat an intersessional Standing Steering Group on IWC Global Data Repositories and National Reports (GDR) with the following tasks: (1) Review technical progress on existing Global Data Repositories (i.e. databases); (2) Consider needs and specifications for potential new databases, including developing simple technical guidelines on new proposals (Annex 1: Chapter 5.1.3.2); 3) Produce a budget and workplan for the implementation and development of existing and new databases.

10. LIST OF WEB PAGES AND PORTALS LINKED TO THE SC HANDBOOK [TO BE COMPLETED]

- ✓ Venues and dates of all previous meetings (https://iwc.int/historical)
- ✓ Intersessional correspondence groups (LINK TO WEBPAGE: https://iwc.int/correspondence-groups)
- ✓ Abundance summary table
- ✓ Biennial report on agreed abundance estimates including a basin wide summary
- ✓ Meetings' portal

- ✓ SORP (https://iwc.int/sorp and http://www.marinemammals.gov.au/sorp)
- ✓ WW portal

11. CONSOLIDATED COMPILATION OF SCIENTIFIC COMMITTEE RULES OF PROCEDURE, WORKING METHODS, GUIDELINES AND PROTOCOLS: ANNEX 1

In 2018, the Committee introduced the use of a consolidated compilation of Committees' Rules of Procedure, details on working methods, guidelines and protocols (e.g. 'Annex P', 'Requirements and Guidelines for Implementations under the Revised Management Procedure', 'Data Availability Guidelines', 'Guidelines for DNA data quality control for genetic studies relevant to IWC') to allow this material to be easily accessible and reference all updates throughout time.

Annex 1 contains the following documents already agreed by the Scientific Committee and endorsed by the Commission:

1) Rules of Procedure of the Commission, Financial Regulations and Rules of Procedure of the Scientific Committee;
2) Requirements and Guidelines for Implementations under the Revised Management Procedure (RMP);
3) Requirements and Guidelines for Conducting Surveys and Analysing Data within the Revised Management Scheme
4) Draft Guidelines for Aboriginal Subsistence Whaling Management Procedure *Implementation Reviews*
5) The Revised Management Procedure (RMP) for Baleen Whales
6) Guidelines for DNA data quality control for genetic studies relevant to IWC
7) Data Availability Guidelines
8) Protocol for access to samples/data from the Institute of Cetacean Research (ICR)
9) Protocol for access to samples/data from the Cetacean Research Center (CRC), National Fisheries Research and Development Institute
10) Protocol for access to data from the University of Auckland under Procedure B for the In-Depth Assessment of Western North Pacific common Minke whales
11) Protocol for access to samples/data from the National Research Institute of Far Seas Fisheries (NRIFSF), Fisheries Research Agency, Japan, for data availability
12) Southern Ocean Research Partnership (SORP): Data availability protocol
13) Southern Hemisphere Blue Whale Catalogue Terms of Reference and Sharing Agreement
14) Procedure to consider applications for the use of acoustic data, tissue samples or photo-identification photographs
15) Template for Research Proposal: Request for use of: (1) IWC IDCR/SOWER; and/or (2) IWC-POWER samples/data
16) DNA registries template
17) IWC Guidelines for Photo-Identification Catalogues
18) Southern Hemisphere Blue Whale Catalogue - Terms of Reference and Sharing Agreement
19) Process for the Review of Special Permit Proposals and Research Results from Existing and Completed Permits
20) Annex S. Trial Approach to Improve the Scientific Committee's Process for Developing a Consensus Budget Recommendation to the Commission. (*J. Cetacean Res. Manage. 16 (suppl.), 2015*)
21) Annex S. Improving the Committee Budget Review Process: Proposal for a Revised Method of Defining and Adopting the Budget and Implications for the Working Methods (*J. Cetacean Res. Manage. 17 (suppl.*), 2016)
22) Annex V. Matters Related to Working Methods (*J. Cetacean Res. Manage.* 19 *(suppl.), 2018*)
23) Annex R. Proposed Funding Mechanism for Allocation of IWC SORP Funds (*J. Cetacean Res. Manage. 12 (suppl.), 2011*)
24) Annex W. Update to the Funding Mechanism for Allocation of Funds from the IWC-SORP Research Fund (*J. Cetacean Res. Manage. 18 (suppl.), 2017*)
25) Annex R. Ad hoc Working Group on IWC Global Data Repositories and National Reports (GDR) (*J. Cetacean Res. Manage. 19 (suppl.), 2018*)
26) Technical guidelines on new proposals for Data bases
27) Informal guidelines for Rapporteurs and sub-groups' chairs, including templates
28) Guidelines on logistic arrangements for Invited Participants' attendance at Scientific Committee meetings
29) IWC policy for paying travel for Invited Participant.

Annex 1

CONSOLIDATED COMPILATION OF RULES OF PROCEDURE, WORKING METHODS, GUIDELINES AND PROTOCOLS OF THE SCIENTIFIC COMMITTEE OF THE INTERNATIONAL WHALING COMMISSION

First compiled: June 2018. Amendments: see footnotes under each chapter.

INTRODUCTION

This is the living Annex of the Scientific Committee Handbook. It is available online [LINK to the SC HB webpage] to the annual IWC Scientific Committee report since 2018. The rational of this Annex is to create a single place where all Rules of Procedure of the Commission and Financial Regulations relevant to the Scientific Committee, as well as all adopted guidelines, protocols, procedures and forms are easily accessible. This document also helps keeping track of all past and future amendments to our working methods, providing the latest updated version of each of these documents.

This Annex include the following documents, in full or as a link to their latest version[LINK ALL FOLLOWING DOCS TO THE RELEVANT SECTION OF THIS ANNEX]:

Chapter 1:
- Rules of Procedure of the Commission, Financial Regulations and Rules of Procedure of the Scientific Committee.

Chapter 2:
- The Revised Management Procedure (RMP) for Baleen Whales;
- Requirements and Guidelines for Implementations under the Revised Management Procedure (RMP);
- Requirements and Guidelines for Conducting Surveys and Analysing Data within the Revised Management Scheme;
- Draft Guidelines for Aboriginal Subsistence Whaling Management Procedure *Implementation Reviews*;
- Guidelines for DNA data quality control for genetic studies relevant to IWC;
- DNA registries template.

Chapter 3:
- Data Availability Guidelines;
- Protocol for access to samples/data from the Institute of Cetacean Research (ICR);
- Protocol for access to samples/data from the Cetacean Research Center (CRC), National Fisheries Research and Development Institute;
- Protocol for access to data from the University of Auckland under Procedure B for the In-Depth Assessment of Western North Pacific common Minke whales;
- Protocol for access to samples/data from the National Research Institute of Far Seas Fisheries (NRIFSF), Fisheries Research Agency, Japan, for data availability;
- Southern Ocean Research Partnership (SORP): Data availability protocol;
- Southern Hemisphere Blue Whale Catalogue Terms of Reference and Sharing Agreement;
- Procedure to consider applications for the use of acoustic data, tissue samples or photo-identification photographs;
- Template for Research Proposal: Request for use of: (1) IWC IDCR/SOWER; and/or (2) IWC-POWER samples/data;
- IWC Guidelines for Photo-Identification Catalogues (data access and sharing);
- Southern Hemisphere Blue Whale Catalogue - Terms of Reference and Sharing Agreement;

Chapter 4:
- Process for the Review of Special Permit Proposals and Research Results from Existing and Completed Permits (ex-Annex P);

Chapter 5:
- Annex S. Trial Approach to Improve the Scientific Committee's Process for Developing a Consensus Budget Recommendation to the Commission. (J. Cetacean Res. Manage. 16 (suppl.), 2015)
- Annex S. Improving the Committee Budget Review Process: Proposal for a Revised Method of Defining and Adopting the Budget and Implications for the Working Methods (J. Cetacean Res. Manage. 17 (suppl.), 2016)
- Annex V. Matters Related to Working Methods (J. Cetacean Res. Manage. 19 (suppl.), 2018)
- Technical guidelines on new proposals for Data bases
- Annex R. Proposed Funding Mechanism for Allocation of IWC SORP Funds (J. Cetacean Res. Manage. 12 (suppl.), 2011)
- Annex W. Update to the Funding Mechanism for Allocation of Funds from the IWC-SORP Research Fund (J. Cetacean Res. Manage. 18 (suppl.), 2017)
- Annex R. Ad hoc Working Group on IWC Global Data Repositories and National Reports (GDR) (J. Cetacean Res. Manage. 19 (suppl.), 2018)

Chapter 6:
- Informal guidelines for Rapporteurs and sub-groups' chairs, including templates

Chapter 7:
- Guidelines on logistic arrangements for Invited Participants' attendance at Scientific Committee meetings
- IWC policy for paying travel for Invited Participants

CHAPTER 1

RULES OF PROCEDURE OF THE COMMISSION, FINANCIAL REGULATIONS AND RULES OF PROCEDURE OF THE SCIENTIFIC COMMITTEE

The Commission's Rules of Procedure, Financial Regulations, Rules of Debate and Scientific Committees Rules of Procedure provide the framework in which the Scientific Committee conducts its business, including meetings (i.e. Terms of Reference and standing items on the Agenda), the role of the Scientific Committee's officers, the Committees' organisation, some financial rules, etc. They were first drafted in 1976 (IWC 1977) and modified in 1985 (IWC 1986), 1999 (IWC 2000), 2012 (IWC 2013) and 2016 (IWC 2017).

The Scientific Committee's rules can be amended. Usually this is done based on proposals from the Committee or in response to Commissions' requests.

This chapter gives a direct link to the latest version of the **Rules of Procedure of the Commission and Financial Regulations relevant to the Scientific Committee**[LINKED](RoP last updated in 2016; to be updated in 2018).

CHAPTER 2

REVISED MANAGEMENT PROCEDURE AND THE ABORIGINAL WHALING MANAGEMENT PROCEDURE

2. ALL DETAILS ON REVISED MANAGEMENT PROCEDURE (RMP) AND ABORIGINAL WHALING MANAGEMENT PROCEDURE (RMP)

This Chapter includes all current information on the Revised Management Procedure (RMP) and of the Aboriginal Whaling Management Procedure (AWMP), including details on the *Catch Limit Algorithm*, *Strike Limit Algorithm*, all definitions used in the *Implementation Reviews*, guidelines for *Implementation Reviews* (*IR*) in the context of the RMP and of the AWMP. It also specifies all requirements for data to be used in an *IR*.

Documents titled '*The Revised Management Procedure (RMP) for Baleen Whales*', '*Requirements and Guidelines for Implementations under the Revised Management Procedure (RMP)*' and '*Requirements and Guidelines for Conducting Surveys and Analysing Data within the Revised Management Scheme*' were finalised in 2011 (IWC 2012, JCRM 13:485-517). The document 'Draft Guidelines for AWMP *Implementation Reviews*' was first drafted in 2012 (IWC 2013, JCRM 14:170-171).

2.1 The Revised Management Procedure (RMP) for Baleen Whales[1]

Please, note that superscript numbers in this section refer to the appended annotations not to footnotes.

2.1.1 Definitions

Regions are non-overlapping major ocean areas. For species found in or migrating to higher latitudes, these will normally be the arctic and adjacent waters, the North Atlantic and adjacent waters, the North Pacific and adjacent waters, and the Southern Hemisphere. For species confined to lower latitudes, the *Regions* will normally be the Atlantic, Pacific and Indian Oceans. *Regions* can be combined for species where the interchange is not negligible.

Small Areas are disjoint areas small enough to contain whales from only one biological stock, or be such that if whales from different biological stocks are present in the *Small Area*, catching operations would not be able to harvest them in proportions substantially[2] different to their proportions in the *Small Area*.

Medium Areas[3] correspond to known or suspected ranges of distinct biological stocks.

Large Areas[4] coincide with *Regions*, unless evidence exists to support the selection of one or more areas smaller than a *Region* which fully covers the range of some biological stocks of a species and definitely excludes whales from all other biological stocks of that species in the *Region.*

Residual Areas[5] are all geographical areas in a *Region* which are outside any *Small Areas. Medium Areas* comprise unions of *Small* and, where identified, *Residual Areas. Large Areas* comprise unions of *Medium* and, where identified, *Residual Areas.*

Combination Areas are disjoint unions of *Small Areas* to which the *Catch Limit Algorithm* is applied when *Catch- cascading* is used.

Management Area is a generic term denoting a *Small, Medium, Large, Residual* or *Combination Area.*

Catch Limit Algorithm is the process (described in section 2.4) that is used to calculate a catch limit for a *Management Area*.

Years[6] are consecutive periods of 12 months used for the compilation of time series of catches and abundance data for application of the *Catch Limit Algorithm*. neither this definition, nor any statement following, should be construed as precluding the possibility of a regulation that a catch limit calculated in such an application may be taken only during a certain part of the *Year*.

Catch-cascading[7] is the process by which a catch limit calculated for a *Combination Area* is distributed among the *Small Areas* that make up the *Combination Area* in proportion to the calculated relative abundances in those *Small Areas*. When *Catch-cascading* occurs, the relative abundances for *Small Areas* within the *Combination Area* shall normally be calculated from the same estimates of absolute abundance as were used for the application of the *Catch Limit Algorithm* to the *Combination Area*. the calculated relative abundance in a *Small Area* shall be an appropriate form of weighted average of the available abundance indices for that *Small Area*, with the statistically appropriate weighting, except that each estimate shall also be further weighted by the factor 0.9^n, where *n* is the number of years that have elapsed between the *Year* to which the estimate refers and the *Year* of the *Catch Limit Calculation*.

Catch-capping[8] is the process by which *Catch Limits* calculated for *Small Areas* are adjusted by reference to those calculated for either *Medium* or *Large Areas* containing those *Small Areas*. It consists of the following rules. If the sum of the catch limits calculated for those *Small Areas* that make up a *Medium* (or *Large*) *Area* exceeds the catch limit calculated for the *Medium* (or *Large*) *Area*, then both the *Small* and *Medium* (or *Large*) area catch limits shall apply in such a way that the maximum catch allowed in each *Small Area* is the appropriate *Small Area* catch limit and the maximum catch allowed in the *Medium* (or *Large) Area* is the *Medium* (or *Large*) *Area* catch limit. This definition does not preclude the possibility of applying *Catch-capping* to overlapping *Medium Areas.*

An *Implementation* involves the designation of the *Management Areas* and their boundaries and the selection of *Catch-cascading* and/or *Catch-capping* options for a particular species and *Region*. these designations and/or selections may be changed in a subsequent *Implementation Review*.

A *Catch Limit Calculation* is the process by which catch limits for a species in a *Region* are calculated for all *Small* (and where appropriate *Medium* or *Large*) *Areas* within that *Region*, as specified in Sections 2.3.3, 2.3.4 and 2.3.5, by application of the *Catch Limit Algorithm* as described in section 2.4. this algorithm uses historic catch data and estimates of absolute abundance for each *Management Area* that meet the requirements of section 2.3.2.

2.1.2 Implementations *and* Implementation Reviews

Implementations and *Implementation Reviews* are conducted by the Scientific Committee on a *Regional* basis. they involve the delineation of *Small Areas* and, where appropriate, *Medium* and *Large Areas*. a selection between possible options for *Catch-cascading* and/or *Catch- capping* is made during an *Implementation (Review)*, which includes the designation of *Combination Areas* as may be appropriate. this process is described as an *Implementation* on the first occasion it takes place for a species in a *Region*; subsequent revisions are termed *Implementation Reviews*[9]. An *Implementation (Review)* shall take account of the available biological and operational data, including in particular those data pertaining to stock-identity. An *Implementation (Review)* is conducted by species or other suitable taxonomic unit below the species level[10]. Such taxonomic units should be treated separately for the purpose of *Catch Limit Calculations* (see section 2.3) where the extent of geographical separation is sufficient to make this feasible. In the following text, 'species' should be taken to refer to taxonomic units below the species level where appropriate.

2.1.3 Catch Limit Calculations

2.1.3.1 SCOPE AND PERIOD OF VALIDITY

Catch limits pertain to the first *Year* commencing after their calculation by the Scientific Committee, and for each of the following four *Years*[11]. a catch limit is calculated for each *Small Area* in a *Region* for each of these six *Years*. the six catch limits calculated for each *Management Area* shall be equal, except where adjustments are made under the phaseout rule specified in section 2.3.4. A *Catch Limit Calculation* involves the (re)calculation of catch limits for all *Small Areas* and, where appropriate, *Medium* or *Large*

Areas in the *Region*. at the request of the commission, the first of these catch limits calculated may alternatively refer to the *Year* in which the calculation takes place, and for each of the following five *Years*.

Where appropriate, a carry-over provision may be attached to the set of six catch limits calculated for a *Small Area*, and shall operate as follows. Where a catch limit for a *Small Area* is not reached in any one *Year*, the shortfall may be added to the catch limit for the same *Small Area* in any of the remaining years of validity of the *Catch Limit Calculation*. any unused carry-over remaining at the end of the fifth *Year* of validity of the *Catch Limit Calculation*, or at the beginning of the first *Year* of validity of a new *Catch Limit Calculation*, whichever is the sooner, lapses. [11a]

2.1.3.2 DATA REQUIREMENTS[12]

2.1.3.2.1 Catch history

Time series of catches by sex shall be compiled for each of the *Management Areas* specified within the region, using the best available information. these catch histories shall cover a period beginning not later than the *Year* of the first recorded or estimated[13] catch and ending with the *Year* preceding the first *Year* for which catch limits are to be calculated.[14]

If there are catches known to have occurred in the *Region*, but the *Small Area* in which they were taken is not known, they shall be assigned to the *Small Area* in which they are considered most likely to have been taken. *Pro rata* allocations are allowed. Where the sex ratio of catches is not accurately known, the best available estimate of the sex ratio shall be used to divide the catches; in the absence of any information, a 50:50 sex ratio shall be assumed. Unspecified catches of whales shall be allocated to species using the best available information on the species composition of the catch[15]. Known or estimated numbers of whales struck and lost shall be added to the catches. If the timing of catches is uncertain, they shall be assigned to *Years* according to the best available information. no catches known to have occurred in the *Region* shall be omitted from the *Catch Limit Calculation* on grounds of uncertainty over their location, timing, sex ratio or other details. all known removals[16] from a *Region* shall be included in the catch series.

2.3.2.2 Absolute abundance estimates

Absolute abundance data to be used in the calculation of catch limits shall have been obtained by direct methods[17], such as sightings surveys, and collected and analysed using methods approved by the Scientific Committee. *Management Areas* to which the *Catch Limit Algorithm* is applied should normally be surveyed at intervals not exceeding six years. the methods shall be such as to provide estimates of whale abundance that have acceptable levels of bias and precision. they shall also permit estimation of the variance of each estimate and of their variance-covariance matrix, or alternative variance-related statistics where appropriate.

Data for any sightings survey[18] to be used to calculate abundance estimates for the purposes of conducting a *Catch Limit Calculation* shall be documented and provided to the Secretariat in computer readable data files before a specified time in advance of the Scientific Committee meeting during which the data are to be used. all such data should be archived by the secretariat in an

appropriate database such that abundance estimates can be calculated for any specified *Small Area*. Data should be in a fully disaggregated form so that estimates can be recalculated appropriately if the boundaries of *Management Areas* are altered. Once lodged with the secretariat, these data shall be available to accredited scientists as defined in the Scientific Committee's rules of procedure.

Estimates of absolute abundance are required for each *Management Area* to which the *Catch Limit Algorithm* is to be applied under the procedures described in section 2.3.3[19]. For each such *Management Area*, a time series of absolute abundance estimates shall be calculated, along with an estimate of their variance-covariance matrix, or alternative variance-related statistics where appropriate. the approximate distributional properties of the abundance estimates shall also be determined. care should be taken to avoid substantially underestimating the variance (or alternative variance-related statistic) of each abundance estimate used for input into the *Catch Limit Algorithm*.[20]

The absolute abundance estimate for a given *Year* should ideally be calculated from data collected in that *Year*. Data collected in different *Years* may be used, for example to account for parts of the area that were not covered in that *Year*[20a], to pool results from surveys conducted over consecutive or nearly consecutive *Years* in order to reduce variance, or to provide estimates of calibration factors, provided that appropriate statistical methods are used[21].

Data from surveys conducted in different *Years* or at different times of year may only contribute to a single abundance estimate if adequate precautions are taken to avoid substantial double counting of whales due to migration or other factors. In the calculation of an absolute abundance estimate for a *Management Area* in a given *Year*, parts of the area for which there are no absolute abundance estimates available at any time meeting the above specifications shall be treated as having an absolute abundance of zero[21a].

The absolute abundance estimates should pertain to the total number of whales aged one year and above in the *Management Area*, regardless of any size limits that may be in force or the selectivity or otherwise of any past or present exploitation[22]. Animals aged less than one year shall be excluded where possible.

2.3.3 Options for determination of catch limits

Catch limits shall always be set at the *Small Area* level and they shall be set for each *Small Area* in a *Region*. In addition, where *Catch-capping* is invoked at the *Medium* or *Large Area* level, corresponding catch limits will be set for those *Medium* or *Large Areas*. catch limits for all *Residual Areas* within a *Region* shall be set at zero.

Catch limits for the total number of whales that may be taken in a season in each *Small Area* will be calculated by:

(a) application of the *Catch Limit Algorithm* to the *Small Areas* or, where appropriate, to *Combination Areas*, in which case *Catch-cascading* occurs; and

(b) where appropriate, by adjustment of the *Small Area* catch limits calculated, with or without *Catch- cascading*, under (a) by either:

  (1) application of the *Catch Limit Algorithm* to one or more of the *Medium Areas*, followed by *Catch- capping* of the *Small Area* catch limits; or

  (2) application of the *Catch Limit Algorithm* to one or more of the *Large Areas*, followed by *Catch- capping* of the *Small Area* catch limits.

Catch limits for the total number of whales that may be taken in a *Year* in *Medium* or *Large Areas*, as required when *Catch-capping* is invoked, will be calculated by application of the *Catch Limit Algorithm* to those *Medium* or *Large Areas*.

The decision for any particular species or *Region* on whether or not *Catch-capping* is to be applied, and if so whether it should be applied at the *Medium* or *Large Area* level, and whether or not *Small Areas* are to be combined for the purposes of *Catch-cascading*, will be made on the basis of biological evidence available to the Scientific Committee, and, where necessary, the results of computer simulation trials[23] conducted by the Scientific Committee. Where computer simulation trials are carried out, they shall, as far as possible, encompass the full range of plausible hypotheses (regarding, for example, stock identity) consistent with existing biological data.

2.3.4 Phase-out rule

The catch limits for a *Small Area* calculated under section 2.3.3 shall be adjusted downwards when the time series of absolute abundance estimates used for the application of the *Catch Limit Algorithm* to the *Small Area* (or, if *Catch-cascading* has been applied, to the *Combination Area* containing it) does not include an absolute abundance estimate pertaining to a *Year*[23a] not more than ten years[24] prior to the *Year* to which the catch limit pertains. under these circumstances, the catch limit for the *Small Area* shall be reduced by 20% of the unadjusted catch limit for that *Small Area* and *Year* for each year in excess of ten years that has or will have elapsed since the *Year* of the most recent such abundance estimate[25]. this rule shall also be invoked in a *Small Area* included in a *Combination Area* for *Catch-cascading* if the data used for the derivation of absolute abundance estimates for input to the *Catch Limit Algorithm* do not contain any survey effort in that *Small Area* within this ten year period.

2.3.5 Adjustments for recent sex ratios in the catch

If the proportion, P_f, of female whales in the total catch taken from a *Small Area* in the most recent five *Years* prior to the *Catch Limit Calculation* for which the catch data are available exceeds 50%, the catch limits for the *Small Area* calculated according to the procedure described in sections 2.3.3 and 2.3.4 shall be adjusted downwards by the ratio $0.5/P$[26] However, should the Scientific Committee decide it to be more appropriate, this adjustment ratio shall be determined from the proportion of females in the total catch taken from a union of *Small Areas*, and applied to the catch limit for each *Small Area* in the union. Further, the sex ratio adjustment shall be waived if the Scientific Committee agrees that the catches taken in the most recent five *Years* for which the catch data are available are too few to provide a useful indication of the expected future sex ratio of the catch[26a].

2.3.6 Adjustment for other sources of human-caused mortality

Catch limits calculated under the revised management procedure shall be adjusted downwards to account for human-induced mortalities due to sources other than commercial catches. each such adjustment shall be based on an estimate provided by the Scientific Committee of the size of adjustment required to ensure that total removals over time from each population and area do not exceed the limits set by the revised management procedure. total removals include commercial catches and other human-induced mortalities caused by indigenous subsistence whaling, whaling under Special Permit for scientific research, whaling outside the IWC, bycatches and ship strikes to the extent that these are known or can be reasonably estimated[26aa].

2.4 *Catch Limit Algorithm*

The nominal catch limit for a *Management Area* shall be calculated using the algorithm defined below if at least one estimate of absolute abundance as defined in Section 2.3.2 is available for the *Area* in question. Otherwise, the nominal catch limit for the *Management Area* shall be zero.

2.4.1 Input data

The input data for application of the *Catch Limit Algorithm* for any *Management Area* shall include the time series of annual catches as detailed in section 2.3.2.1 and the time series of absolute abundance estimates, along with their variance- covariance matrix or other appropriate variance-related statistics and a specification of the distributional form of the absolute abundance estimates, as specified in Section 2.3.2.2.

2.4.2 Population model

The following population dynamics model[27] shall be used:

$$P_0 = P_T / D_T$$

$$P_{t+1} = P_t - C_t + 1.4184 \mu P_t (1 - (P_t/P_0)^2)(0 \le t < T)$$

where:

P is the population size in numbers at the beginning of *Year t*;

C is the catch in numbers in *Year t*;

D is the ratio of the population size at the beginning of *Year T* to the population size at the beginning of *Year* zero, known as the stock depletion;

Year zero is the first *Year* of the catch series used in the *Catch Limit Calculation* (as specified in section 2.3.2.1); *Year T* is the first year for which a catch limit is to be calculated in the current *Catch Limit Calculation*;

μ is the productivity parameter[28].

Provided there have been at least some catches, the population dynamics model is fully determined when the catch series and the values of D and μ are specified. If there have been no catches, a nominal catch of one whale in *Year* zero is assumed.

2.4.3 Fitting of the model

The annual absolute abundance estimate (if there is one) for each *Year t*, is assumed to have expectation bP_t where b is the bias parameter. the joint likelihood function of the parameters b, D and μ is determined using the absolute abundance estimates, the variance-covariance matrix of the absolute abundance estimates (or alternative variance- related statistics where appropriate) and information on their distributional form.

Unless there are specific indications to the contrary[29], the absolute abundance estimates shall be assumed to be lognormally distributed with a variance-covariance matrix of the log estimates to be estimated from the data using methods judged appropriate by the Scientific Committee. In this case, the formula for the likelihood is:

Likelihood $(D_T, \mu, b) \propto \exp[-\tfrac{1}{2}(\mathbf{a} - \mathbf{p} - \mathbf{b1})' H (\mathbf{a} - \mathbf{p} - \mathbf{b1})]$

where:

a is the vector of logarithms of estimates of absolute abundance by season;

p is the vector of logarithms of the modelled annual population sizes: $p = \log(P)$;

b is the logarithm of the bias parameter: b = log(b);

1 is a vector of ones;

H is the information matrix of the **a** vector.

If *H* is non-singular, $H = V^{-1}$ where *V* is the variance- covariance matrix of the components of **a**.

The stock depletion parameter *D* is assigned a prior probability distribution[30] that is uniform from zero to one, and zero outside this range.

The productivity parameter μ is assigned a prior probability distribution[30] that is uniform from zero to 0.05, and zero outside this range.

The bias parameter *b* is assigned a prior probability distribution30 that is uniform from zero to 5/3, and zero outside this range.

The above three prior distributions are treated as independent and combined accordingly to determine the joint prior distribution of the parameters *DT*, μ and *b*.

The joint 'posterior' distribution of the parameters *DT*, μ and *b* is defined as follows:

Posterior (DT, μ, b) $\propto$ Prior (DT, μ, b).

Likelihood $(DT\ \mu, b)^S$

where *s*, the scale parameter, is set equal to 1/16. the presence of the scale parameter represents an intended deviation from a strictly Bayesian approach.

2.4.4 The catch control law

The internal catch limit, L_T, is the following function of D_T, μ and P_T:

$L_T = 3\mu(DT - 0.54)\ P_T$ if $D_T > 0.54$

0 if $D_T \leq 0.54$

The marginal posterior distribution of L_T is obtained by integration of the joint posterior distribution of (DT, μ, b).

This requires that, for each value of L_T, the joint posterior distribution of (DT, μ, b) is to be integrated over the subset of parameter space that corresponds to that value of L_T. The nominal catch limit is equal to the lower 0.4020 percentile of the marginal posterior distribution of L_T[31].

2.4.5 Computation

All steps in the above algorithm for the calculation of the nominal catch limit shall be performed using a computer program validated by the IWC Secretariat and with sufficient numerical accuracy that the calculated nominal catch limit is numerically accurate to within one whale. catch limits shall be rounded to the nearest integer number of whales after the apportionment of limits to small areas (when catch-cascading is applied) and after performing each of the adjustments specified in sections 2.3.4, 2.3.5 and 2.3.6.

2.5 Annotations to the Revised Management Procedure for baleen whales

(1) The trials carried out to date have largely been based on simulated management of baleen whales with breeding grounds in lower latitudes and feeding grounds in higher latitudes, and with whaling operations and abundance surveys restricted to higher latitudes. thus, while the species may be distributed over an entire *Region* as defined here, most data will pertain only to a restricted part of the *Region*. While it is believed that the framework for calculation of catch limits specified here will be sufficiently flexible for management of species in *Regions* not directly matching the conditions simulated so far, this needs to be affirmed by the additional simulation trials required before implementation of the RMP in such cases. this would be especially important in the case of humpback or right whales, for which there is a possibility of whaling in the breeding grounds, on feeding grounds and on migrations between these in the one year.

The development of the RMP has been a long and difficult task, involving a wide range of scientific and technical issues and a thorough and extensive testing process. The Scientific Committee has recommended a protocol for evaluating amendments to the RMP which is given in *Rep. int. Whal. Commn* 44:47-8.

2.5.1. Definitions

(2) *Small Areas* are the mechanism used in the RMP to ensure that the proportion of a catch that comes from a particular stock reflects approximately that stock's contribution to the abundance estimates being used in the *CLA* to determine catch limits for that *Small Area*. When whaling takes place primarily on feeding grounds in mixed stock situations, specification of *Small Areas* requires consideration of the appropriate spatial scale only. However, when the RMP is to be applied where whaling is to occur in a migratory area or a combination of migratory and feeding areas, the temporal as well as the spatial dimensions in which

whaling is to take place need to be considered. In mixed stock situations both the overall abundances and the relative proportions of different stocks in areas may change seasonally. In particular, there may be substantial differences in these quantities between the period in the year in which whaling occurs and in which the abundance surveys take place. In this situation, it may be desirable to define some *Small Areas* that encompass portions of both feeding and migratory areas. If this is to be done, *Small Areas* should still be defined, to the extent possible, with the aim that the overall proportions of whales taken from different stocks reflect approximately each stock's contribution to the abundance estimates being used in the *CLA*. In order to achieve this, some additional temporal and/or spatial restriction on whaling within a *Small Area* may be required as part of an RMP *Implementation*. the judgement on whether or not differences in the proportion may be substantial will, in the first place, be based on estimates of movements and rates of mixing, and on relevant operational factors. Where a proposed *Small Area* is such that concerns exist that the potential differences in the proportions might be substantial, its acceptability will be judged on the basis of the risk of inadvertent depletion of some of the stocks in the *Region*, as estimated from suitable trials. conducting such simulations will be a normal part of the initial *Implementation* of the RMP to a *Region* and species. additional trials may also be necessary where it is proposed to increase the size of existing *Small Areas*. In the situation where *Small Areas* are defined to be a combination of feeding and migratory areas, whaling operations would have some discretion within the limits of whatever restrictions were imposed on the timing and location where whaling occurs. This means that in conducting *Implementation Simulation Trials* uncertainty would exist about the timing and area from which whales will be taken (and thus the proportional takes from different stocks). In such cases, the simulations will need to have finer spatial and temporal resolution than that of the *Small Areas* and an annual time step respectively to ensure that a proposed *Implementation* is robust to this uncertainty. the principle to be followed in such simulations is to assume that the whales will be taken in a way that would entail the greatest risk with respect to depletion, while at the same time remaining consistent with operating procedures for the whaling activities proposed by the nation or nations concerned. as such, the actual risk is likely to be less. (*J. Cetacean Res. Manage. (Suppl.)* 8: 84).

(3) *Medium Areas* play a secondary role in the RMP, in that they are used only when *Catch-capping* is applied; it is not necessary for application of the RMP for any *Medium Areas* to be defined. In cases where *Medium Areas* can be identified with some confidence, so that *Medium Areas* approximate to ranges of actual stocks, *Catch-capping* is most appropriately carried out at the *Medium Area* level, rather than at a *Large Area* level. see also annotation 8.

(4) As indicated, normally *Large Areas* will coincide with *Regions*. an example of when a *Large Area* may be smaller than a *Region* is the case in which there is a geographically isolated stock of whales within the *Region* which does not mix with other whale stocks within the *Region*.

(5) Normally, in cases where the whales migrate to higher latitudes, these *Residual Areas* will be confined to lower latitude areas within a region. In such cases, they will normally also be unsurveyed, and so will be assigned an absolute abundance of zero. as indicated in section 2.3.3, catch limits are set at zero for *Residual Areas*.

(6) a *Year* is normally a calendar year for northern Hemisphere *Regions* and split-years (for example, July 1 - June 30) for southern Hemisphere *Regions*. Where possible, a *Year* should be compatible with the whaling season established in terms of the definition in the schedule.

(7) Where *Small Areas* identified in a region are also quite small in size, it is likely that the absolute abundance estimates for these *Small Areas* will have large variances associated with them. On the other hand, estimates of absolute abundance for some combinations of these *Small Areas* may have considerably greater precision. Provided sufficient evidence exists to warrant combining some *Small Areas*, the process of *Catch- cascading* can be used to take advantage of this greater precision. In calculating the relative abundances in the *Small Areas* making up a *Combination Area*, a weighted average of past abundance indices for those *Small Areas* is used. the additional factor of 0.9^n is included to downweight abundance data from *Years* separated by *n* years from the *Year* of the *Catch Limit Calculation*. criteria for deciding whether or not *Catch-cascading* should be applied are given in section 2.3.3.

An example of the calculation involved is as follows. If the absolute abundance estimates are treated as being lognormally distributed, then the relative abundance for a *Small Area* would normally be calculated using the following formula.

Let:

a = vector of log abundance estimates in the *Small Area;*

t_i = difference between the current *Year* and the *Year* of the *i*th estimate;

F = information matrix of **a**.

If *F* is non-singular, $F=V^{-1}$ where *V* is the variance-covariance matrix of **a**. *G* is the matrix such that:

$$G_{ij} = F_{ij}(0.9)^{-(t_i+t_j)/2}$$

The relative abundance in the *Small Area* is given by:

$$\exp\left[\left(\sum_i \sum_j a_i G_{ij}\right) / \left(\sum_i \sum_j G_{ij}\right)\right]$$

(8) *Catch-capping* is a process designed to ensure that catch limits calculated individually for some *Small Areas* are not inappropriately large, as is possible in some cases of uncertain stock identity. as indicated in section 2.3.3, whether or not *Catch-capping* is invoked in the *Catch Limit Calculation* for a species in a particular *Region* will depend on examination of available data and possibly simulation trials for that species and *Region*. *Catch-capping*, if it is invoked, will be carried out at the *Medium* or *Large Area* level depending on the degree of certainty existing about the identification of *Medium Areas*. Where that degree of certainty is relatively high, *Catch-capping* should be carried out at the *Medium Area* level. Where no *Medium Areas* are identified for a species and region, *Catch-capping* should be carried out at the *Large Area* level, if invoked. Where *Medium Areas* are identified, but only tentatively, the decision as to whether any *Catch-capping* should be carried out at the *Medium* or *Large Area* level should be determined from results of appropriate simulation trials.

Catch-capping can be applied together with *Catch- cascading*. In this case, after the *Small Area* catch limits have been calculated under *Catch-cascading*, the capping option is invoked.

2.5.2 Implementations *and* Implementation Reviews

(9) An *Implementation* is required before the *Catch Limit Algorithm* can be applied to a new species and *Region* for the first time. An *Implementation Review* for a species and *Region* should normally be scheduled no later than six years since the completion of the previous *Implementation (Review)*. In some cases an *Implementation (Review)* may require the specification and running of further *Implementation Simulation Trials*, especially when major changes to *Management Area* boundaries or the selection of different options for *Catch-capping* and/or *Catch-cascading* than those currently used is contemplated. In such cases the *Implementation Review* would probably not be completed at a single meeting. In the meantime, *Catch Limit Calculations* continue to be based on the existing *Management Areas* and options.

In some cases, it may be appropriate to carry out an *Implementation Review* earlier than six years after the previous *Implementation (Review)*. this would be warranted, for example, if important new evidence on stock identity becomes available, if major advances are made in methodology of calculating absolute abundance estimates, if major changes occur in the areas covered by the abundance surveys, or if other evidence becomes available to the Scientific Committee suggesting that the premises on which the previous *Implementation (Review)* was conducted are no longer appropriate.

Implementation Simulation Trials involve identifying the range of plausible hypotheses relevant to recommending an *Implementation* or *Implementation Review* and formulating simulation models which conform to these hypotheses. computer simulations are used to evaluate the effect under these models of applying the cla to designated *Management Areas* with various *Catch- cascading* and/or *Catch-capping* options. If none of the options tried produces satisfactory performance on conservation criteria across the range of hypotheses it may be that *Management Areas* are inappropriately defined. If the range of plausible hypotheses is very broad, it may be that additional information is required to narrow the range of plausible hypotheses before application of the RMP can be recommended. Further explanation is given in *Rep. int. Whal. Commn* 45:117-19.

(10) Normally, *Implementation (Reviews)* will be carried out at the species level. However, if sub-species, varieties or different morphological forms of baleen whales exist in a *Region* such that they can be identified in catches and separate absolute abundance estimates can be obtained for them, then *Implementation (Reviews)* should be conducted separately, provided the degree of geographical separation is sufficient to allow this.

2.5.3 Catch Limit Calculations

2.5.3.1 SCOPE AND PERIOD OF VALIDITY

(11) To provide an uninterrupted series of catch limits, a new *Catch Limit Calculation* will normally be required not more than six years after the preceding one. However, a *Catch Limit Calculation* should be carried out sooner than this if a new abundance estimate meeting the requirements of section 2.3.2.2 becomes available. even if no new abundance estimate has become available, it could be necessary to carry out the new *Catch Limit Calculation* up to one year before the expiry of the current six-*Year* series of catch limits, to ensure timely availability of the resulting figures. In the event of difficulties of finalising the analysis of new abundance data in time to be used in the *Catch Limit Calculation* for the next six-*Year* period, the *Catch Limit Calculation* shall nevertheless be carried out with the existing agreed data.

(11a) The following example explains how this provision operates. suppose that a *Catch Limit Calculation* yields a set of six annual catch limits of 500 whales for a *Small Area*. suppose also that the catch taken in Year 1 amounts to 400 whales. then, up to 600 whales may be taken from the same *Small Area* in Year 2. If the catch taken in Year 2 amounts to, say, only 480 whales, then up to 620 whales may be taken in Year 3. If the catch taken in Year 3 amounts to 550 whales, then up to 570 whales may be taken in Year 4. the provision thus affects the way the RMP *Catch Limits* are applied, but not the *Catch Limits* themselves. simulation studies of the effects of this provision on the performance of the *Catch Limit Algorithm* are reported in IWC/49/4 annex D.

2.5.3.2 DATA REQUIREMENTS

(12) In addition to the requirements outlined in section 2.3.2, data and methods for analysing them that are used in the application of the RMP should meet the minimum standards described in *Rep. int. Whal. Commn* 45:215- 17.

2.5.3.2.1 Catch history

(13) For stocks for which exploitation started relatively recently, the catch history over the entire period of exploitation will be well known. For other stocks, however, where exploitation has extended over many years and possibly intermittently over centuries, records for early catches may be incomplete, or gaps may exist. the intent here is that the catch histories for use with the RMP should extend as far back as possible. Where there are no gaps in a long historical record of catches, the catch series used in *Catch Limit Calculations* shall start in the first season for which the catch has been recorded or estimated sufficiently reliably. Where there are gaps, or there is major uncertainty about the early catch history, selection of this first *Year* will be made on a case by case basis.

The RMP has been demonstrated to be robust to considerable uncertainties in catch histories in single stock robustness trials (*Rep. int. Whal. Commn* 42:272).

(14) In the event of catch data for the most recent years not yet being available, input to the *Catch Limit Algorithm* shall assume that the catches taken are equal to the limits set for those *Years*.

(15) Where the information is insufficient to allocate catches to species sufficiently reliably, the potential consequences of incorrect allocations may need to be examined by simulation trials.

(16) The population model used in the *Catch Limit Algorithm* (see section 2.4) effectively assumes that all whales that die from causes other than those resulting from natural mortality are included in the catch history. thus, known [or estimated] 'indirect' catches, e.g. whales killed through entanglement in fishing gear [(including those that subsequently strand)], should also be included in the catch history, in addition to whales caught or struck and lost in direct whaling operations. On the other hand, stranding is assumed to be part of the process of natural mortality, and numbers of whales stranded [due to natural causes] should not be included in the catch history.

2.5.3.2.2 Absolute abundance estimates

(17) In the early stages of development of the RMP, it was envisaged that absolute abundance estimates, relative abundance indices, or both could be used. The difficulty with use of relative abundance indices that are collected as part of or associated with catching operations of the type carried out prior to the development of the RMP, is that the precise relationship between the index and the true absolute abundance is rarely known. these issues were discussed at the cpue workshop, at which the types of information necessary to clarify this relationship were also identified (*Rep. int. Whal. Commn* 38:157- 62). as this relationship has remained unresolved, the possible use of such data was dropped for the present. possible use of relative abundance indices other than those associated with catching operations was not investigated during development of the RMP.

Note that the above does not preclude the use of estimates of relative abundance during *Catch-Cascading* (see annotation 7) or in analysing abundance data collected in different *Years* (see section 2.3.2 and annotation 21). In some circumstances, the best available estimates of absolute abundance may come from mark- recapture analyses, e.g. those resulting from photo-identification studies. The properties of such estimates, and the implications of these with respect to possible uncertain stock identity and migration patterns need to be evaluated before estimates of abundance based on them may be used when implementing the RMP for a particular species and *Region*. until this is done, sightings surveys or other direct methods of estimation with similar statistical properties remain the primary tools for obtaining suitable estimates of absolute abundance for *Catch Limit Calculations*.

(18) The types of data that are required fall into two categories: data necessary for standard analyses (e.g. sightings effort data and sightings records) and ancillary data (as appropriate according to the analyses to be carried out, e.g. dive-time records) (*Rep. int. Whal. Commn* 44:44-5).

(19) In the simulation trials of the RMP carried out so far, it has been assumed that absolute abundance estimates are available for effectively all the *Management Areas* within the *Region* being assessed. as indicated later in section 2.3.2, *Management Areas* for which no suitable estimates of absolute abundance are available are treated as having an absolute abundance of zero. this, along with the possible application of *Catch-capping* described in section 2.3.3, makes adequate provision for cases where surveys have not been conducted for some parts of the range in the *Region* being assessed, provided the unsurveyed area does not form too large a proportion of that range.

(20) This is because trials have shown adverse behaviour when there is a high probability of substantial underestimation of the variance. this can occur even when the variance estimator is statistically unbiased, but has a high variance. estimators for the variance (or alternative variance related statistics) should take into account, to the extent possible, all sources of observation error, and should not themselves have such high variance that there is a serious risk of markedly overestimating the precision of an abundance estimate. these remarks do not apply to zero abundance estimates, which should be handled in the way described in annotation 29 unless a more appropriate alternative method is available. simulation trials have shown that process error additional variance may need to be taken into account when the observation error is low and the process error this is high. some examples in this regard may be found in *Rep. int. Whal. Commn* 44:75-6.

Note: Observation error is the sampling error arising from the survey methods and design. the level of observation error is inversely related to the amount of survey effort, provided that the survey is well designed. Process error **[additional variance]** reflects the extent to which abundance estimates from repeat surveys of the same area in successive years will vary more than would be expected on the basis of the observation error alone, for example due to variations in the numbers of whales moving into or out of the survey area.

(20a) In cases when abundance estimates are derived from multi-year surveys, the abundance estimates for a *Management Area* should have a *Year* time stamp that is an effort-weighted average of the years used in the abundance estimation, and that

average *Year* should be rounded to the nearest appropriate twelve month period. see annotation 25a for the question of time stamps for the purpose of applying the *Phaseout Rule* (*J. Cetacean Res. Manage. (Suppl.)* 4: 114-15).

Statistical methods to be used in the calculation of absolute abundance estimates from data collected in different years shall ensure, *inter alia*, that (i) no piece of data receives undue weight; (ii) the absolute abundance estimate is referred to the most appropriate *Year*; (iii) the data contributing to an absolute abundance estimate for any *Management Area* in a given *Year* shall normally all have been collected within a ten year period, and where possible not more than five years earlier or later than the *Year* to which the abundance estimate refers; and (iv) in the case of a *Small Area* or a *Combination Area*, except for contributions to calibration factors, data collected in a *Year* other than that to which the estimate refers shall not contribute disproportionately to the abundance estimate. a contribution to the abundance estimate of more than 50% would normally be considered disproportionate. For some stocks of whales currently at low levels of abundance, it may be necessary to pool data over a period longer than ten years in order to obtain reliable estimates of some calibration factors. It is possible that in the future, appropriate alternative statistical methods may be developed for calculating time series of absolute abundance estimates in which data from all *Years* are analysed together, e.g. methods based on generalised linear models (sc/F92/mg8; *Rep. int. Whal. Commn* 44:93-4). For such methods, the above requirements may need revision. When adding contributions from different parts of a *Management Area* covered in different years to provide a composite abundance estimate for that area, additional variance between these parts should be taken into account (*J. Cetacean Res. Manage. (Suppl.)* 3: 114-15). [Ref to check]

(21a) Whether part of an *Area* counts as 'unsurveyed', and is therefore assigned a zero abundance, depends on the survey design and the extent to which it is realised. a part of an *Area* without survey effort counts as unsurveyed if it is large compared with the typical area between adjacent transects, such that the density in the remaining area cannot be reliably extrapolated to the unsurveyed area. a part of an *Area* which is unsurveyed in a single year may count as surveyed when the data from several years are combined, provided that an appropriate multi-year regression analysis is used, and additional variance is taken into account. (*J. Cetacean Res. Manage (Suppl.)* 4: 114-15).

(21) In the simulation trials conducted so far, it has been assumed that estimates of absolute abundance correspond to whales of all ages from one year upwards.

2.5.3.3 Options for determination of catch limits

(22) The committee has recommended that suitable case- specific simulation trials be carried out prior to the initial implementation of the RMP for each species and *Region*. these have been termed *Implementation Simulation Trials*, to distinguish them from the more generic robustness trials used during the development of the RMP.

Where simulation trials are used during implementation to evaluate the appropriateness or otherwise of *Catch- cascading* and/or *Catch-capping*, and in the latter case whether at the *Medium* or *Large Area* level, judgements will be based on comparisons of performance of the different options against a base case where catch limits are calculated and set by *Small Area* only. the addition of *Catch-capping* to other options leads to the setting of catch limits lower than or equal to those which would be set in the absence of *Catch-capping*. Where the performance of suitable simulation trials of the base case option for setting catch limits is satisfactory in terms of statistics related to lowest and final depletion levels, it would not normally be judged necessary to invoke *Catch-capping* ('depletion' is defined in Section 2.4.2). However, where the performance of the base case option is judged unsatisfactory in terms of the depletion statistics, and this is rectified when one of the *Catch-capping* options is used, *Catch-capping* at the relevant level shall be invoked.

Catch-cascading normally leads to higher catch limits than the base case option. accordingly, *Catch- cascading* may only be invoked when simulation trials show that it does not lead to unsatisfactory performance on depletion statistics related to lowest and final depletions.

Examples of examination of these issues in the context of potential implementation of the RMP to southern Hemisphere and north atlantic minke whales are given in Annexes E and F of the 1992 Report of the Scientific committee (*Rep. int. Whal. Commn* 43:104-14 and 115-29).

2.5.3.4 Phaseout rule

(23a) In the case where abundance estimates are derived from multi-year surveys, *Year* is defined as in annotation 20a in terms of an effort-weighted average for the *Small Area* in question. thus, each *Small Area* has its individual time stamp *Year* to which the *Phaseout Rule* is applied. (*J. Cetacean Res. Manage. (Suppl.)* 4: 114-115).

(23) Discussion of issues relating to the selection of this time period is recorded in *Rep. int. Whal. Commn* 44:48 (Item 9).

(24) This provision will ensure that the catch limit will be reduced linearly to zero in six years. all six catch limits, including phaseout adjustments, are to be calculated at the time of the *Catch Limit Calculation*. this allows prior warning to the commission and member governments that future phaseouts will occur within six years unless new abundance estimates meeting the requirements of section 2.3.2 become available and a *Catch Limit Calculation* is performed.

2.5.3.5 Adjustments for recent sex ratios in the catch

(25) An example may help clarify this formulation. suppose that in the six years prior to the *Catch limit calculation*, during which the annual catch limit was 100 whales, the total catch from the *Small Area* comprised 200 males and 300 females, i.e.

P=300/(200+300)=0.6. suppose also that prior to the sex ratio adjustment, the annual catch limit indicated by the *Catch Limit Algorithm* for each of the next five years is 132 whales. The adjusted catch limit is then:

$132 \times 0.5/P = 132 \times 0.5/0.6 = 110$ whales per annum

Note that the aim of the *Catch Limit Algorithm* in setting the pre-adjustment catch limit is that this comprise equal numbers (66 in this case) of males and females. the intent of the adjustment is that no more than 66 females will be caught: if the female proportion remains at 0.6, this will be achieved exactly by the adjustment process because 0.6 x 110=66.

(26a) The order in which catch limits are calculated is as follows:

(i) the *Catch Limit Algorithm* is applied to compute catch limits for *Small Areas* and/or *Medium/ Large Areas* and *Combination Areas* as required, with the associated abundance estimates utilised having the time stamps specified in annotation 20a;

(ii) when *Catch-cascading* is involved the associated catch limit for a *Combination Area* is distributed amongst the constituent *Small Areas* (see annotation 9);

(iii) the *Phaseout Rule* (section 2.3.4) is applied to catch limits for *Small Areas*;

(iv) the adjustment for recent sex ratios in the catch (see section 2.3.5) is applied to catch limits for *Small Areas*;

(v) *Catch-capping* limitations, if relevant, relate to

Small Area limits as evaluated at stage (iv).

Note:

(1) any subtraction of incidental catches from the catch limits output from the RMP as above would take place at the end of this process at the *Small Area* level, and separately at the *Medium/ Large Area* level if *Catch-capping* was applied. However, as this is an RMS rather than an RMP feature, no wording to cover this is proposed here.

(2) *Catch-capping* has effect only when the catch limit for a *Medium/Large Area* is less than the sum of the limits for the constituent *Areas*. the RMP does not specify how limits are then reduced in these *Areas* - that is left to the operators - though RMP trials assume pro rata reductions. Sections 2.3.4 and 2.3.5 of the RMP indicate that phaseout and sex ratio adjustments apply only to *Small Areas*, so that steps (iii) and (iv) above do not affect *Medium/Large Area* limits computed in step (i) if *Catch-capping* applies.

2.5.3.6 ADJUSTMENT FOR OTHER SOURCES OF HUMAN-INDUCED MORTALITY

(26aa) For the purpose of this provision, 'known' or 'can be reasonably estimated' shall be interpreted as follows:

(a) if the recorded mortalities of the specified types are considered by the Scientific Committee to be reasonably complete, the adjustment shall be based on these;

(b) if the recorded mortalities of a given type are considered to be incomplete, but an estimate is available that is acceptable to the Scientific committee, the estimate shall be used;

(c) if the recorded mortalities of a given type are considered to be incomplete, but there is insufficient information to make an acceptable estimate, the recorded mortalities shall be used as a fall-back, but the committee shall note the problem in its report.

In the case of bycatch, ship strikes, and non-IWC whaling, the 'size of adjustment required to ensure that total removals over time from each population and area do not exceed the limits set by the revised management procedure' should normally be calculated as follows, unless specific circumstances indicate otherwise: the catch limit for each *Year* of the *Catch Limit Calculation* shall be reduced by 20% of the total (over the most recent five-year period for which data or estimates are available) of the recorded or reasonably estimated mortalities for the *Management Area* to which the catch limit applies. the adjustment shall be calculated at the time of the *Catch Limit Calculation*.

In the case of Scientific Permit catches, the adjustment to the catch limit for each *Year* shall be based on the maximum proposed scientific take for the given *Management Area* in the given *Year* as specified in a research whaling proposal submitted to the Scientific committee. the adjustment can be made whenever a research proposal is submitted, without performing a new *Catch Limit Calculation*. In the case of indigenous subsistence whaling regulated by the IWC, the adjustment to the catch limit for each *Year* shall be based on the maximum allowed strike permitted for that *Year*, or, in the case of a multi-year strike limit, on the average annual strike limit.

If the unadjusted catch limit for a *Management Area* is less than the adjustment, the resulting catch limit is zero. In the cases of uncertainty with respect to location, mortalities shall be allocated to *Management Areas* as specified in section 2.3.2.1. In cases where a carry-over provision under section 2.3.1 is operative, the carry-over is applied to the catch limits after the adjustment under 2.3.6. For example, suppose that there is a catch limit of 850 in a given year, but a scientific catch of 350 whales is proposed: the commercial catch limit for the year is reduced to 500. If the commercial limit is fully taken, but only 200 whales are taken under the scientific permit, the shortfall of 150 whales will be carried over and added to the catch limit for the following year.

To the extent known, the sex ratio of the human-caused mortalities that are taken into account in section 2.3.6 should be taken into account in the calculation of the sex ratio of the recent total catch as specified in section 2.3.5.

(26B) The order in which catch limits are calculated is as follows:

(i) the *Catch Limit Algorithm* is applied to compute catch limits for *Small Areas* and/or *Medium/ Large Areas* and *Combination Areas* as required, with the associated abundance estimates utilised having the time stamps specified in annotation 20a;

(ii) when *Catch-cascading* is involved the associated catch limit for a *Combination Area* is distributed amongst the constituent *Small Areas* (see annotation 9);

(iii) the *Phaseout Rule* (section 3.4) is applied to catch limits for *Small Areas*;

(iv) the adjustment for recent sex ratios in the catch (see section 2.3.5) is applied to catch limits for *Small Areas*;

(v) the adjustment for other sources of human- caused mortality (section 2.3.6) is applied to the catch limits for each *Management Area (Small, Medium, Large);*

(vi) *Catch-capping* limitations, if relevant, relate to

Small Area limits as evaluated at stage (v).

Note: *Catch-capping* has effect only when the catch limit for a *Medium/Large Area* is less than the sum of the limits for the constituent *Areas*. the RMP does not specify how limits are then reduced in these *Areas* - that is left to the operators - though RMP trials assume pro rata reductions. Sections 2.3.4 and 2.3.5 of the RMP indicate that phaseout and sex ratio adjustments apply only to *Small Areas*, so that steps (iii) and (iv) above do not affect *Medium/Large Area* limits computed in step (i) if *Catch-capping* applies.

2.5.4 Catch Limit Algorithm

2.5.4.1 POPULATION MODEL

(26) The population dynamics model used here has the form of a discrete time version of the Pella-Tomlinson model. neither the form of model used, nor its parameter values, are meant to give an accurate representation of the population dynamics of baleen whales. rather, it is a model which, when used as an integral part of the *Catch Limit Algorithm*, has been demonstrated to allow robust calculation of catch limits.

(27) The parameter μ is related to the MSY rate. For the population model used, MSYr = 0.9456μ.

2.5.4.2 FITTING OF THE MODEL

(28) An example where the lognormal assumption cannot be used is when the estimate of absolute abundance is zero. Zero estimates of absolute abundance arise when no sightings of the target species are made on primary effort during a survey of an area. this should not be a frequent occurrence, but such estimates should not be ignored when they do occur.

Although several factors contribute to the variance of an estimate of absolute abundance, the variance is dominated by the variance in the number seen when the number of sightings is very low. the variance of the number of sightings will be at least as high as the variance of a random variable with a Poisson distribution with expectation equal to the expectation of the number of sightings. the number of sightings refers to the number of schools or groups, rather than to individual animals.

The expected number of sightings, e(n), is proportional to the true absolute abundance, P:

$$E(n) = P/\alpha$$

The parameter α represents the estimate of absolute abundance that would have been obtained had there been exactly one sighting. this will be a function of the survey effort, the size of the area, and survey parameters that may need to be estimated by adopting values from similar surveys. Ignoring the variance of a, the likelihood of the zero estimate of absolute abundance is the following function of the true absolute abundance:

$$L(P) = \exp(-P/\alpha)$$

Since the only covariance between the absolute abundance estimate and other absolute abundance estimates is that due to the a parameter, whose variance is being ignored, the joint likelihood function of the zero estimate of absolute abundance and the remaining estimates is taken to be the product of the respective likelihood functions.

The information about the zero estimate of absolute abundance that needs to be supplied to the *Catch Limit Algorithm* is: (i) the *Year* of the zero estimate; (ii) the fact that it is a zero estimate; and (iii) the value of the a parameter. the computer program implementing the *Catch Limit Algorithm* that has been validated by the IWC secretariat has the facility to handle zero estimates of absolute abundance in this manner. P is identified with the simulated population size generated by the *Catch Limit Algorithm's* internal calculations.

Since the treatment above ignores some contributions to the variance of a zero estimate of absolute abundance, it assigns more weight to a zero estimate than is strictly warranted.

(29) Despite their appearance, the prior distributions assumed here are not standard Bayesian priors on the selected parameters reflecting prior beliefs about the likely distribution of the corresponding biological parameters. the procedure adopted here is Bayes-like, rather than strictly Bayes. the distributions and ranges were selected to provide 'optimum' performance in relation to a set of agreed performance statistics in simulation trials. If likely ranges and distributions of the corresponding biological parameters change from current perceptions, the appropriate way to take account of these changed perceptions is to revise the

simulation trials, and if appropriate change the tuning (*Rep. int. Whal. Commn* 42:55) of the procedure, rather than altering the 'priors'.

2.5.4.3 THE CATCH CONTROL LAW

(30) This percentile was agreed in 2001 (*J. Cetacean Res. Manage. (Suppl.)* 4: 5) to implement the commission's choice (*Rep. int. Whal. Commn* 42: 47-48) of a 0.72 tuning level.

2.5.5 References

MISSING, FOR EXAMPLE: Rep. int. Whal. Commn 42, J. Cetacean Res. Manage. (Suppl.) 4: 114-115, Rep. int. Whal. Commn 43, Rep. int. Whal. Commn 43, Rep. int. Whal. Commn 38:157- 62

2.2 The Aboriginal Whaling Management Procedure (AWMP) for Baleen Whales

[SLAs TO BE DONE: DONOVAN]

2.3 Requirements and Guidelines for *Implementations*[1] under the Revised Management Procedure (RMP)[2]

An Implementation for a species in a Region involves the delineation of Small Areas and, where appropriate, Medium, Large, and Residual Areas. A selection between possible options for *Catch-cascading* and/or *Catch-capping* is made during an Implementation, which includes the designation of Combination Areas as may be appropriate.

The overall Implementation process (Table 2.3.1) involves deciding if there is sufficient information to begin a pre-Implementation Assessment, conducting a *pre-Implementation Assessment* and then after completing the pre-Implementation Assessment, proceeding to an Implementation, which should normally to be conducted over two annual meetings and two intersessional workshops. the outcome from an Implementation will be recommendations to the commission regarding variants of the RMP (if there are any given current information) that can be used to set catch limits for the species in the Region. In this context, an RMP variant consists of specifications for where and when whaling is to occur (i.e. specifications for Management Areas and for temporal constraints on the whaling operation) and whether, for example, *Catch-capping* or *Catch-cascading* are to be applied. The recommendation to the commission will be accompanied by suggestions for research needs. these suggestions may, for example, focus on research needed to eliminate some of the considered hypotheses or to confirm that hypotheses originally considered to be of 'low medium plausibility[3], but to which the RMP is not very robust in terms of conservation, should rather be considered to be of 'low' plausibility[4]. The committee will prioritise the suggested research activities taking into account feasibility, cost and the likely utility of the results.

Table 2.3.1: Recommended schedule for an *Implementation* and subsequent *Implementation reviews*

(1) x+ Annual meetings	**(2) First Intersessional workshop**	**(3) First Annual Meeting**
'*Pre-Implementation Assessment*'[1]	Trial structure development	Conditioning and final trial structure
The *pre-Implementation Assessment* will take place during one or more Annual Meetings and will focus on the following issues: (1) the establishment of plausible stock hypotheses consistent with the data that are inclusive enough that it is deemed unlikely that the collection of new data during the *Implementation* process would suggest a major novel hypothesis (e.g. a different number of stocks) not already specified in the basic trial structure; (2) examination of available abundance estimates; and (3) information on the geographical and temporal nature of 'likely' whaling operations - taking into account the complexity of the situation with regard to spatio-temporal issues. On the basis of this assessment, the Committee will make a recommendation as to whether or not to formally begin the *Implementation* process.	The primary objective is to develop an appropriate *Implementation Simulation Trials* structure and to specify the associated conditioning so that it can be carried out before the First Annual Meeting. Workshop discussions will include: (1) a final review of the plausible hypotheses taking into account the probable management implications to avoid unnecessary work; (2) an examination of more detailed information on expected operations; (3) the determination of the small geographical areas that will be used in specifying the stock structure hypotheses and operational pattern; (4) the development of (options for) potential *Small Areas* and management variants; (5) the specification of the data and methods for conditioning the trials; (6) further consideration of experimental ways to distinguish amongst competing stock hypotheses. It is important to note that after this stage: (1) there shall be no changes to the agreed trials structure that implements the agreed plausible hypotheses; (2) no new data will be considered.	The primary objective is to review the results of conditioning and to finalise the *ISTs*. This review may include new analyses of data but not new data. The trials may be changed but not the overall structure. Tasks include: (1) final consideration of plausibility, including weighting trials in terms of the overall balance of the ISTs; (2) discussion of what data/ research may reduce number of hypotheses; (3) updates to standard data sets (i.e. abundance, catches, bycatches) for use in final trials; (4) specification of operational features and management variants: (5) specification and classification of final trials: (6) develop timetable for remaining work.
(4) Second Intersessional workshop	**(5) Second Annual meeting**	**(6) Intervening period**
Review results of final trials	Committee recommendations	Data collection: see box 5
The primary objective is to review the results of the final trials and develop recommendations for consideration by the full Committee on: (1) management areas; (2) RMP variants (e.g. Catch- cascading, Catch-capping); (3) associated operational constraints (e.g. temporal	The primary objective is to review the results of the Second Intersessional Workshop (including any additional trials) and agree recommendations for implementation. If this includes a recommendation for a 'less conservative' option, integral to this will be an agreed research programme guided and approved the	RMP annotation 9 (section 2.1.2) specifies that an *Implementation Review* should normally be scheduled no later than 5 years since completion of the previous *Implementation (Review)*, but earlier if important new evidence on stock identity, major changes to abundance estimation methodology, etc.

[1] Throughout this document, the term *Implementation* refers to the process leading to the Committee making a recommendation of catch limits (zero or otherwise) to the Commission, not an implementation by the Commission itself.
[2] See IWC 2012, pp. 483-494 for the full text of the RMP.
[3] For ease of presentation, the term 'plausibility' will be used to refer to hypotheses and 'weight' to refer to trials.
[4] Or 'no agreement'.

restrictions); (4) research needs (either within or outside operations) to narrow range of plausible hypotheses; use of 'a less conservative' variant with appropriate research and associated time period (this will require additional trials to be run).	Committee A progress report on this programme must be submitted annually to the Scientific Committee.	
(7) Annual Meeting	**(8) Intersessional Workshop**	**(9) Annual Meeting**
Examine new information and determine if this is inside/outside tested parameter space and/or if it has narrowed hypotheses. If yes, need new trials and at least one workshop If no, straight to *Implementation Review* at Annual Meeting (9)	Determine new trials to account for new information (depending on complexity, this may resemble either stage (2) or stage (3)	Carry out *Implementation Review*. Make recommendations to Commission.

The committee may decide to recommend more than one RMP variant to the commission. this may take the form of recommending an RMP variant which did not perform 'acceptably'[5] for all trials for application for a 10-year period, during which time a research programme, guided and approved by the committee must be conducted. this 10-year research programme would include both data collection and data analysis. an Implementation Review at the end of the 10-year period will evaluate the results of the research programme. If this evaluation reveals that the research has shown that the trials for which the RMP variant did not perform 'acceptably' should be assigned 'low' weight, future catch limits will be based on this variant. However, if the research did not show that these trials should be assigned 'low' weight, future catch limits will be based on a more conservative RMP variant (see section 2.3.4.1) than that applied over the first 10 years following a 5-year period in which the less conservative variant is phased-out, such that the performance over a 100-year period is still acceptable, i.e. the combination of the two RMP variants will be such that conservation performance over 100 years has acceptable risk. If an RMP variant which is linked to required research is adopted by the commission, a progress report on the research programme must be submitted annually to the Scientific Committee. Failure to implement the research programme to the satisfaction of the committee will result in catch limits immediately being based on the more conservative RMP variant that would have been put in place following the 10-year period.

In order for it to be possible to apply the RMP variant adopted by the commission for a species and *Region*, it is necessary for the committee to specify the catches, the bycatches and the estimates of abundance (and their variance-covariance matrix) for this species and *Region* as well as future projected anthropogenic removals (IWC, 2001, p.5). the process of specifying these inputs to the *CLA* must occur in parallel with the specification of trials and RMP variants and the selection of a RMP variant. It must be completed by the second annual meeting if it is intended that the *CLA* will be applied after the *Implementation* is complete. It is important that the set of catches and abundance estimates considered in trials is sufficiently broad that the catches and abundance estimates used when applying the *CLA* are encapsulated by this set.

2.3.1 Pre-Implementation assessment

The purpose of a *pre-Implementation Assessment* is to try to answer specific questions agreed by the Committee to determine whether it is in a position to embark on the *Implementation* process in order to be able to provide advice on catch limits under the RMP. It is not the same as an in- depth assessment which aims to provide an estimate of the status of a population. Its primary objective is to develop a set of plausible stock structure hypotheses that will be specified in terms of an operating model to be used in the *Implementation Simulation Trials* (*IST*s). In addition, abundance estimates and the likely temporal and spatial aspects of intended whaling operations and future surveys will be considered.

2.3.1.1 INFORMATION REQUIRED TO INITIATE A *PRE-IMPLEMENTATION ASSESSMENT*

At the outset, it is the responsibility of a member government or several member governments to propose that a species in a *Region* should become a candidate for consideration for an eventual *Implementation*.

(1) any IWC member(s) seeking an RMP *Implementation* shall develop a proposal and submit this to the committee for consideration *at least one meeting before* the proposed meeting at which the *pre-Implementation Assessment* is to begin. this proposal must include a summary of data and related information including:
   (i) operational data;
   (ii) extent of likely whaling operations and future surveys;
   (iii) abundance; and
   (iv) stock structure and movement.
   (v) the proposal must include an overall summary table of this information (Table 2.3.2 includes a suggested format and a few hypothetical examples). the proposal need not be limited to this summary table and it is expected that narrative and additional tables would be included in a proposal. the committee will evaluate the information in terms of:
      (a) whether the abundance and genetics data provide adequate geographic coverage of the entire *Region* and particularly where abundance surveys and harvest have occurred in the past and are likely to occur in the future; and
      (b) whether the data are in a suitable form for analysis by the committee.

   It is extremely important that discussions on plausible hypotheses begin at an early stage. although not required, progress through the *pre-Implementation Assessment* will be facilitated if the stock structure data have been analysed and the proposal includes an initial suggestion for a set of inclusive stock structure hypotheses for consideration by the committee. If requested, an e-mail correspondence group of the committee will be established to provide guidance on

[5] Section 2.3.4.1 of this document provides guidelines for 'acceptable' performance.

this process.

(2) the committee will review the summary and, taking account of the advice of an e-mail correspondence group, determine if there is sufficient information to initiate a *pre-Implementation Assessment*.
(3) If the Committee determines that there is insufficient information, it will specify additional data/information requirements.
(4) If the Committee determines that there is sufficient information, the plans for a *pre-Implementation Assessment* (including data requirements at the appropriate resolution) will be included in its annual Work plan submitted to the commission.
(5) If the commission approves the committee's Work plan, then procedure a regarding data availability will apply (see IWC, 2004, p.57).

If all the above conditions are met, the committee will be in a position to begin to carry out the *pre-Implementation Assessment*.

Table 2.3.2: Example summary table of existing data for proposals for *pre-Implementation assessment* with a few hypothetical illustrations

Item	Details	Raw format	Where held	Analytical methods	Key papers	Comments
Operational data						
Catch history	E.g. nation, operation, date, length, sex, other	E.g. electronic	IWC	-	E.g. Wright-Phillips, 20??; Anelka, 20??	Being updated
Effort data	E.g. simple (e.g. CDW), time budget	E.g. paper	National lab -	IWC, 19??		
Abundance						
Shipboard	E.g. dates, tracks, what recorded, methodology	E.g. electronic suitable for Distance	IWC-DESS	E.g. line-transect, no $g(0)$ - correction		Already accepted by SC
Aerial	E.g. as for shipboard	E.g. electronic suitable for Distance	IWC-DESS	E.g. cue-counting		
Stock structure and dispersal rates						
Genetic	E.g. *n*, allozyme, microsatellite, etc.	See Section 9.1		E.g. hypothesis testing, boundary rank, dispersal rates		
Morphometric	E.g. what measured, *n*, positions, sex, etc.			E.g. PCA		
Discovery marks	E.g. releases, recoveries (dates, positions, effort, etc.)	See Table 99.99		E.g. simple plots, effort based probabilities		
Telemetry	E.g. *n*, tracks, dive times etc.			E.g. simple plots, input to aerial survey analysis		
Biological parameters	E.g. reproductive data (foetal, dates, positions, *n* etc.)					
Ecological	E.g. pollutant, parasites					

NB: this example does not attempt to include all data. In addition, information is also required on future surveys and operations.

2.3.1.2 NATURE OF THE ASSESSMENT

The *pre-Implementation Assessment* will focus on the following issues:

(1) the establishment of plausible stock hypotheses[6] consistent with the data that are inclusive enough that it is deemed unlikely that the collection of new data during the *Implementation* process will suggest a major novel hypothesis (e.g. a different number of stocks) not already specified in the basic trial structure[7];
(2) examination of available abundance estimates;
(3) information on the geographical and temporal nature of 'likely' whaling operations and future surveys – taking into account the complexity of the situation with regard to spatio-temporal issues; and
(4) information on the geographical and temporal nature of 'likely' future levels of anthropogenic removals other than due to commercial whaling.

During the *pre-Implementation Assessment*, the Committee may use a 'simple model filter' (e.g. Punt, 2003) to examine the importance of any hypothesised factors in a management context, in order to inform future work and the development of appropriate *Implementation Simulation Trials*.

The *pre-Implementation Assessment* may take place over several annual meetings (although it is possible that it could be completed during a single annual meeting). some iteration may occur as additional research is identified and conducted. unlike later stages of the *Implementation* process, new data can be introduced during the *pre-Implementation Assessment* to refine the set of hypotheses.

2.3.1.2.1 Outcome

On the basis of this assessment, the committee will make a recommendation as to whether or not to formally begin the *Implementation* process. this decision will be based on whether the following information is available.

(1) abundance estimates:
    (i) abundance estimates for use in conditioning *IST*s (data need to have sufficient temporal and spatial resolution to allow

[6] At this stage, the hypotheses will need to be specified in broad detail only (hypothesised locations of breeding grounds, feeding grounds, movement corridors, number of stocks) - values for parameters related to, for example, dispersal and movement will not be expected at this stage.
[7] This could be judged by evaluating the power of more (genetic) samples to identify additional stocks in the *Region*.

estimates to be developed at the scale of the sub-areas that would be likely to be used in simulation trials);
(ii) abundance estimates for use in the *CLA*[8] (data meeting the specifications for abundance estimates in the RMP – see the guidelines for surveys, IWC 2012, pp. 507-528);
(iii) whether and how account is taken of $g(0)$ – e.g. when conditioning the trials/applying the *CLA*; and
(iv) plans for future surveys (including spatial coverage and frequency).

(2) catches:
(i) catch history to be used in the *CLA* in the trials - as complete as possible at this stage (e.g. including incidental catch) and with sufficient spatial resolution for the *Management Areas* likely to be considered in the *Implementation*; and
(ii) where appropriate, alternative possible catch histories for use in *IST*s in cases of uncertainty over catch history, including incidental catch.

(3) an inclusive set of stock structure hypotheses which, it is agreed, cover the plausible range that needs to be tested in the trials.
(4) Initial discussion of experimental ways to distinguish amongst competing stock hypotheses.
(5) any data to be used to estimate dispersal rates among putative stocks within the operating models[9].
(6) any data (e.g. values for biological parameters such as natural mortality and fishery selectivity) intended to be used when conditioning the operating models.

If the committee does not recommend that the *Implementation* process can begin, it will formulate appropriate research recommendations to try to obtain necessary information. If it recommends favourably, then the *Implementation* timetable begins. the committee will advise the commission of the resource implications of starting the *Implementation* process and will indicate any delays that might result due to lack of resources (such as lack of staff/funding for intersessional meetings).

2.3.2 First Intersessional Workshop

The primary objective of the First Intersessional Workshop is to develop an appropriate *Implementation Simulation Trials* structure and to specify the associated conditioning so that it can be carried out before the following annual meeting. the aim of such trials[10] is to encompass the range of plausible scenarios involving *inter alia* stock structure, MSY rates (*MSYR*), removals and surveys. these trials are used to investigate the implications of various choices of RMP variants such as *Catch-cascading* from a risk- and catch-related perspective, with a view to recommending an appropriate variant for implementation of the RMP for a specific species/area.

Workshop discussions will include the items listed below.

(1) A final review of the plausible hypotheses arising from the *pre-Implementation Assessment* (and, if appropriate, elimination of any hypotheses that are inconsistent with the data) - this will take into account the probable management implications of such hypotheses to try to avoid unnecessary work in the precise specifications of hypotheses for which management implications are very similar.
(2) an examination of more detailed information on expected operations and future surveys, including whether coastal, pelagic, on migration, on feeding grounds, on breeding grounds or combinations of these. When providing such information, users and scientists may provide options or suggest modifications to the pattern of operations and the programme of future surveys.
(3) the determination of the small geographical areas ('sub-areas') that will be used in specifying the stock structure hypotheses and operational pattern in the operating model.
(4) the development of (options for) potential *Small Areas*[11] and management variants.
(5) The specification of the data and methods for conditioning the trials that will be carried out before the next annual meeting (an e-mail correspondence group will be established to make revisions should any problems arise).
(6) Further consideration of experimental ways to distinguish amongst competing stock hypotheses.

It is **important** to note that after this stage:

(1) there shall be no changes to the agreed trials structure (i.e. the factors on which the trials are based, but not including management variants, *Small Area* definitions, etc.) that implements the agreed plausible hypotheses; and
(2) no new data will be considered, although new analyses of existing data may be presented to the First annual meeting (see below).

2.3.3 First Annual Meeting

The primary purpose of the First annual meeting is to review the results of conditioning and to finalise the *IST*s. It is expected that failure to achieve adequate conditioning will be avoided through revisions to the trials specifications by the e-mail correspondence group. However, if some trials cannot be conditioned, this may or may not influence the relative weights assigned to the trials (e.g. if a specific instance of a stock structure hypothesis cannot be conditioned adequately, this does not necessarily imply that the stock structure hypothesis concerned is implausible).

This review may include new analyses of data available up to the time of the previous workshop, but new data may **not** be introduced at this stage. after reviewing the results of the conditioning, the *Trials* themselves may be changed, but the overall structure **cannot** be changed.

[8] NB: having the estimates themselves is not a prerequisite since such estimates are only required for the provision of advice once the Implementation is completed - it is more important to know that such estimates are likely to be obtainable at this stage.
[9] Operating models are representations of plausible underlying hypotheses for population dynamics that provide the basis for the simulation trials.
[10] A trial is the combination of a set of 'hypotheses' (e.g. about stock structure, *MSYR*).
[11] *Small Areas* cannot be smaller than sub-areas.

The primary output will be the detailed specifications of the final *IST*s. these will be determined on the basis of:

(1) final consideration of the plausibility of the various hypotheses and hence the weight assigned to each of the trials (the overall balance of the *IST*s will be accounted for when weights are assigned);
(2) discussion of what data/research may reduce the number of hypotheses and possible time-frames for this research/data collection;
(3) updates/improvements to standard data sets (i.e. abundance, catches, bycatches) for use by the *CLA* in final trials and when evaluating the plausibility of hypotheses and hence assigning weights to trials (new data would not be used when conditioning the trials); and
(4) specification of operational features (geographical and temporal), future surveys and management variants.

The specification of final trials will:

(1) include trials to examine effects of using one RMP variant over an initial period (up to 10 years) followed, after a 5-year phase-out period, by a more conservative variant (see discussion below);
(2) exclude 'low' weight trials (e.g. those where at least one factor is considered to have 'low' plausibility); and
(3) assign weights to the remaining trials of 'high', 'medium', or 'no agreement'[12].

A timetable for the remaining work (including circulation of trial results and format) will be developed – the timetable will be determined so that there is a reasonable expectation that the results of the trials will be available well before the second Intersessional Workshop.

The committee will also commence discussions related to defining the inputs for actual application of the *CLA* (catches, bycatches, estimates of abundance and projected future anthropogenic removals).

2.3.4 Second Intersessional Workshop

The primary objective of this workshop is to review the results of the final trials and develop recommendations for consideration by the full committee on:

(1) management areas;
(2) RMP variants (e.g. *Catch-cascading*, *Catch-capping*);
(3) associated operational constraints (e.g. temporal restrictions);
(4) suggestions for future research (either within or outside whaling operations) to narrow the range of plausible hypotheses/eliminate some hypotheses; and
(5) 'less conservative' variant(s) with their associated required research programmes and associated duration.
(6) discussions regarding the inputs to the actual application of the *CLA* will continue.

2.3.4.1 GUIDELINES FOR THE REVIEW OF ISTS

It is to be hoped that the attention to the development of final *IST*s will have ensured that the number of trials is minimised. In order to extract the most information out of the results of the *IST*s, conservation performance should be examined for each RMP variant and trial. the set of decision rules listed below is semi-automatic. It is not, however, fully automatic because some 'human integration' of results will be necessary, particularly to inform decisions about whether future research is needed. during review of the results, discussions will continue on the development of a research programme to try to distinguish amongst hypotheses, for final recommendation at the Second Annual Meeting.

[12] 'No agreement' trials are trials for which a reasonable case is made that the weight should be 'high' although this is in disagreement. trials for which there is disagreement on whether a trial is 'medium' or 'low' would normally be treated as 'medium' in the process of reviewing trial results.

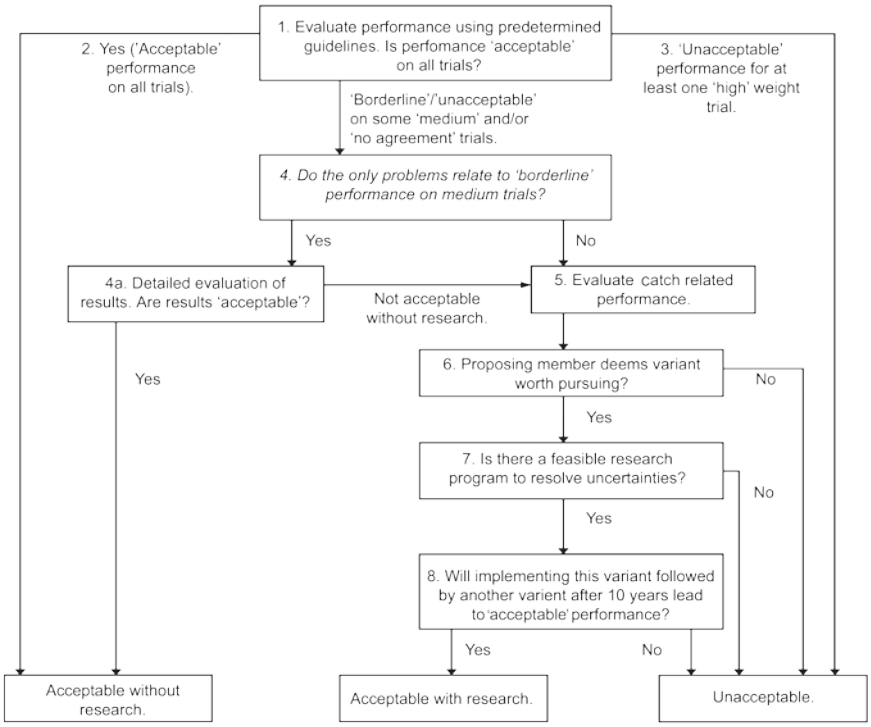


Fig. 2.3.1. Flowchart summarising the process for reviewing trials.

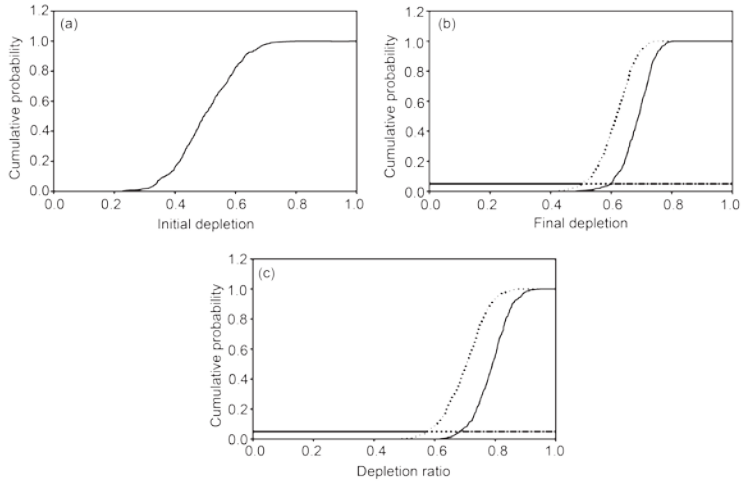


Fig. 2.3.2. Application of the performance criteria evaluated in this paper to a hypothetical *IST*. panel (a) plots the distribution for the initial depletion in the trial. the solid and dotted lines in panels (b) and (c) denote the cumulative distributions for the 0.72 and 0.60 tunings of the *CLA*. the solid, dotted and dashed horizontal lines denote the ranges for the two performance statistics for which performance would be considered to be 'unacceptable', 'borderline' and 'acceptable' respectively.

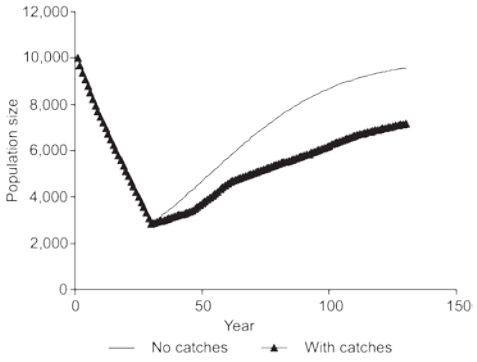


Fig. 2.3.3. two example population size trajectories. the population is initially depleted to 3,000 animals. the solid line corresponds to a no-catch scenario and the triangles to a scenario in which there are catches.

The steps involved in reviewing the *IST*s (see Fig. 2.3.1 for a flowchart of the overall process) will be as follows. Table 2.3.3 applies

each of these steps to an illustrative example.

(1) the conservation performance (given the highest priority by the commission) for each trial and variant shall be examined using the following guidelines to determine whether each combination of variant and trial will be classified as 'acceptable', 'borderline' or 'unacceptable' (see box 1 of Fig. 2.3.1).

For each stock in an *Implementation Simulation Trial* (*IST*) for which *MSYR*=1%:

a) construct a single stock trial, which is 'equivalent' to the *IST*. For example, if a particular *IST* involved carrying capacity halving over the 100-year projection period, the 'equivalent single stock trial' will also involve carrying capacity halving over the next 100 years;

b) conduct two sets of 100 simulations based on this single stock trial in which future catch limits are set by the *CLA*. the two sets of simulations correspond to the 0.60 and 0.72 tunings of the *CLA*[13] (see Figs. 2.3.2 and 2.3.3). rather than basing these calculations on a single initial depletion, the simulations for each stock shall be conducted for the set of initial depletions for the stock concerned in the *Implementation Simulation Trial* under consideration;

c) the cumulative distributions for the final depletion and for the depletion ratio (the minimum over each of the 100-year projection of a trial of the ratio of the population size to that when there are only incidental catches) shall be constructed for each of these two tunings of the *CLA*;

d) the lower 5%-ile of these distributions shall form the basis for determining whether the performance of the RMP for the *IST* is 'acceptable', 'borderline' or 'unacceptable';

e) if the 5%-ile of the final depletion or the 5%-ile of the depletion ratio for the *IST* that shows better performance is less than for the equivalent single stock trial with 0.60 tuning of the *CLA*, the performance of the RMP shall be classified as 'unacceptable';

f) if the 5%-ile of the final depletion or the 5%-ile of the depletion ratio for the *IST* that shows better performance is greater than for the equivalent single stock trial with 0.60 tuning of the *CLA* but less than for the equivalent single stock trial with 0.72 tuning of the *CLA*, the performance of the RMP shall be classified as 'borderline';

g) if the 5%-ile of the final depletion or the 5%-ile of the depletion ratio for the *IST* that shows better performance is greater than for the equivalent single stock trial with 0.72 tuning of the *CLA*, the performance of the RMP shall be classified as 'acceptable'.

(2) this will result in the initial ranking of the variants. Note that this classification step considers only trials weighted as 'high', 'medium' or 'no agreement' because the 'low' weight trials were excluded during the First annual meeting[14]. The exact numerical specifications for the thresholds used when defining 'acceptable' and 'borderline' will be based on the values for relevant performance measures for the single stock trials.

(3) Variants that are classified as 'acceptable' for *all* trials can be recommended to the commission without any additional research (although there may be some suggestions related to future research) (see route '2' on Fig. 2.3.1).

(4) Variants that are classified as 'unacceptable' for any 'high' weight trials are unacceptable and will be eliminated[15] from consideration at this stage (see route '3' on Fig. 2.3.1).

(5) the detailed performance of the variants which performed acceptably for most (taking the balance of the trials into account) of the trials, but 'borderline' for a small number of the 'medium' weighted trials will be examined. If performance on the conservative- related performance statistics for these trials is close to 'acceptable', these variants could be judged 'acceptable' by the committee and could be recommended to the commission without a required research programme (see the two box 4's in Fig. 2.3.1). If this performance is not close to 'acceptable', these variants are considered further as described in step (6).

(6) the performance statistics for the variants for which no decision has yet been made (i.e. they are neither 'acceptable' nor 'unacceptable') are evaluated to determine whether these variants fall into one of three categories: 'rejected/unacceptable', 'acceptable' and 'possibly acceptable with required research'[16].

a) the values of the catch-related performance measures for these variants will be examined and compared with those for the variants which are acceptable (box 5 of Fig. 2.3.1). In addition to the usual statistics: i.e. median, 5th and 95th percentiles for 'total catch', 'catch by *Small Area*, *Medium Area*' and 'average catch over the last 10 years of the 100-year management period', the committee might wish to consider catch statistics for an initial period of management (say 20 years).

b) the IWCc member(s) who made the proposal will be requested to state whether, based on the comparison of the catch-related performance measures, they remain interested in the remaining variants given that application of these variants will require that a research programme guided and approved by the committee be implemented (box 6 of Fig. 2.1.1). Only variants in which interest has been expressed will be retained.

c) For each of the remaining variants, the committee will then decide whether a research programme can be developed that provides information that can be used to assess whether the combination of factors on which the trials for which

[13] The Committee implicitly agreed that tunings from 0.60 to 0.72 for the D1 base-case trial were acceptable for the single stock *CLA* by providing the commission with this range of alternatives. The Commission chose 0.72.

[14] Some 'low' weight trials may be run to confirm which of these trials have a large impact on the performance of the RMP. the results of these trials will not, however, be used to select an RMP variant to propose to the commission, but may play a role in the development of suggestions for future research.

[15] Note that although a variant may be classified as unacceptable, this does not preclude a member government from conducting research which could show that the trial on which performance was unacceptable should have been a 'low' weight trial. Information from such research will be evaluated during the regular *Implementation Review*s. If the results of research show that some trials initially assigned 'high' weight are actually quite unlikely (and deserve 'low' weight), this could result in reconsideration of RMP variants that had previously been rejected.

[16] Note that only variants which achieved 'borderline' performance on 'high', 'medium' or 'no agreement' weighted trials or 'unacceptable' performance on 'medium' or 'no agreement' trials will be considered at this stage because any variants which achieved 'unacceptable' performance for a 'high' weight trial will already be rejected (see step 3).

these variants perform poorly should have been ‘low’ rather than ‘medium’ or ‘high’ weight (box 7 of Fig. 2.3.1). the aspects considered during such an evaluation will include:

I. feasibility of addressing the uncertainties concerned over a 10-year period;
II. the number and nature of trials for which the variants did not perform ‘acceptably’; and
III. the extent to which the variants failed to perform ‘acceptably’.

d) If the committee decides that it is feasible to design a research programme for any of the variants, it will establish additional trials to examine conservation performance, assuming management is based on these variants for 10 years after which management will revert, via a five-year phase-out process, to being based on one of the acceptable variants. The results of these trials will be considered at the second annual meeting.

2.3.4.1.1 An illustrative example of reviewing the results of a set of ISTs [ex Appendix/Table 2.3.3]

The decision rules outlined in Fig. 2.3.1 and section 2.3.4.1 are applied to the illustrative example in Table 2.3.3. In this example, there are six RMP variants and 11 trials (four of which have ‘high’ weight, five ‘medium’ weight and there was no agreement on the weight for the last two trials).

Table 2.3.3 - Conservation performance by management variant and trial.

	Variant								Variant					
Weight	1	2	3	4	5	6	Trial	Weight	1	2	3	4	5	6
High	A	A	A	U	A	A	7	Medium	U	A	A	A	B	A
High	A	A	A	B	B	A	8	Medium	A	A	A	U	A	B
High	A	A	A	B	A	A	9	Medium	B	A	A	U	A	B
High	A	A	A	B	A	A	10	No agreement	B	A	A	U	U	A
Medium	A	A	B	U	A	A	11	No agreement	A	A	A	A	A	A
Medium	A	A	A	B	A	A	-	-	-	-	-	-	-	-

Results: A=acceptable, B=borderline, U=unacceptable.

The initial ranking of the variants in table 1 (see boxes 1, 2 and 3 of Fig. 2.3.1) suggests that only variant 2 is acceptable without additional research because it is the only variant that achieved ‘acceptable’ performance for all of the trials. One possible outcome at this point is that variant 2 could be recommended to the commission. this recommendation would not involve any required research (although there may be some suggestions for research). this initial ranking would also result in rejection of variant 4 as unacceptable because it performs unacceptably on trial 1 (which has ‘high’ weight). a summary of the situation at this point is:

Variant	1	2	3	4	5	6
Status	No decision yet	Acceptable	No decision yet	Unacceptable	No decision yet	No decision yet

The performance of the remaining variants (1, 3, 5 and 6) in table 1 for each trial would now be examined in detail (step 4 in section 2.3.4.1). Variant 3 performed acceptably for all of the trials except trial 5 where its performance was ‘borderline’. the detailed results for this trial would be examined by the committee. assuming that variant 3 was judged acceptable following detailed examination of the performance statistics because its results are close to ‘acceptable’, variant 3 would be deemed acceptable. the summary of the status of the various variants becomes:

Variant	1	2	3	4	5	6
Status	No decision yet	Acceptable	Acceptable	Unacceptable	No decision yet	No decision yet

The decision rule has now reached the point at which decisions need to be made regarding whether any of the remaining variants (i.e. variants 1, 5 and 6 in the example) are acceptable if they are accompanied by required research (step 5 in section 2.3.4.1). the catch-related performance statistics would now be examined and the IWC member(s) who made the proposal for *Implementation* would be requested to state whether they remain interested in variants 1, 5 and 6. let us assume that the member(s) proposing *Implementation* decide that variant 6 does not provide sufficient additional catch to warrant the cost of the large research programme that would be needed to show that the factors that underlie trials 8 and 9 are ‘low’ weight. the summary table now becomes:

Variant	1	2	3	4	5	6
Status	No decision yet	Acceptable	Acceptable	Unacceptable	No decision yet	No worth pursuing

The Committee would then decide for each of the remaining variants (1 and 5) whether a research programme could be developed that provides information that could be used to assess whether that the combination of factors on which the trials for which variants 1 and 5 performed poorly (trials 7, 9 and 10 for variant 1 and trials 2, 7 and 10 for variant 5) should have been ‘low’ rather than ‘medium’ or ‘high’ weight (box 7 of Fig. 2.3.1). a possible outcome of this is that there is no feasible 10-year research programme to revise the weight for trial 9 (which say involves a low value for *MSYR*) so variant 1 (which achieved ‘borderline’ performance for trial 9) would be omitted from consideration. the summary table is now:

Variant	1	2	3	4	5	6

Status	No feasible research	Acceptable	Acceptable	Unacceptable	No decision yet	No worth pursuing

The Committee would then establish additional trials to examine conservation performance if management was based on variant 5 for 10 years (box 8 of Fig. 2.3.1). these trials would involve using variant 5 for ten years followed by one of the acceptable variants. In the case under consideration, there would two ways to running these trials: i) variant 5 followed by variant 3, and ii) variant 5 followed by variant 2. these calculations would be conducted assuming that the catch limits for years 1-10 are calculated using variant 5, the catch limits for years 11-15 are calculated using a weighted average of those from variant 5 and one of variants 2 or 3 (where the weight changes from 1 in year 10 to 0 in year 15), and the catch limit for years 15+ are calculated using variants 2 or 3. If these calculations lead to performance measures for all of the trials that would be classified as 'acceptable' (using the classification scheme in Table 1), variant 5 would be judged to be 'acceptable' if accompanied by a research programme. The final summary table is then:

Variant	1	2	3	4	5	6
Status	No feasible research	Acceptable	Acceptable	Unacceptable	Acceptable with required research	No worth pursuing

2.3.5 Second Annual Meeting

The primary purpose of this meeting is to review the results of the second Intersessional Workshop (including any additional trials) and agree recommendations for implementation including the specifications of the inputs to the *CLA*. If the second Workshop had recommended additional trials, these will be reviewed at the second annual meeting. particular attention will be given to the conservation performance of those trials where a 'less conservative' RMP variant is assumed for the first 10 years, followed by a phase-out period, after which catches are set by a 'more conservative' variant[17]. If conservation performance for these trials satisfies the requirements of adequate performance, that variant [or variants] will be presented as acceptable in association with a research programme agreed by the committee. the associated research programme will be formulated such that it identifies expected progress in a manner that will allow the committee to review annually whether the programme is being adequately followed.

When presenting such variants, it will be explicit that:

(1) if at any time the research programme associated with the RMP variant has not progressed to the satisfaction of the committee, the committee will recommend that catch limits immediately be based on the 'more conservative' RMP variant; and

(2) the option to choose a 'less conservative variant + research programme' can be invoked only once.

2.3.6 References

International Whaling Commission. 2001. Report of the Scientific Committee. *J. Cetacean Res. Manage. (Suppl.)* 3: 1-76.
International Whaling Commission. 2004. Report of the Scientific Committee. *J. Cetacean Res. Manage. (Suppl.)* 6: 1-60.
Punt, A.E. 2003. Progress on software for the rapid evaluation of the performance of the RMP when stock-structure is uncertain. Paper SC/55/SD2 presented to the IWC Scientific Committee, May 2003, Berlin (unpublished). 17pp. [Paper available from the IWC Secretariat].

2.4 Requirements and Guidelines for Conducting Surveys and Analysing Data within the Revised Management Scheme *[CURRENTLY UNDER REVISION - **ZERBINI**]*

2.4.1 Scope

This document is intended to form part of the revised management scheme (RMS)[18] of the International Whaling commission. Its main purpose is to aid the process of obtaining estimates of abundance for use in the revised management procedure (RMP)[19]. by:

(i) stating the requirements of the RMS in this respect (section 2.4.2); and

(ii) providing guidance on methods of conducting surveys and analysing data (sections 2.4.3-2.4.6).

Sections 2.4.3-2.4.6 provide guidance on survey and analysis methodology that has been accepted by the Scientific committee. that is, the methods have been reviewed by the committee prior to the acceptance of estimates of abundance calculated from the data for use in the RMP either as input to the *Catch Limit Algorithm* (*CLA*)[20] or as input to *Implementation Simulation Trials* (*ISTs*)[21]. novel methods, i.e. those that have not been reviewed by the committee in this context, are referred to in section 2.4.7. estimates of abundance calculated from data collected and analysed using methods not yet accepted by the committee would not be suitable for use in the RMP without further consideration by the committee

It is intended that the guidelines in sections 2.4.3-2.4.6 will also be useful for those conducting surveys to obtain estimates of abundance for species/stocks not covered by the RMP. these include whale stocks subject to harvesting under the rules of the

[17] This variant is one those which is acceptable without a required research programme and which, when tested in combination with the 'less conservative' RMP variant, was found to achieve 'acceptable' performance for all trials. this variant need not be the variant among those that are 'acceptable' without a research programme that leads to the highest catches.
[18] *Revised Management Scheme* (*RMS*): This includes all scientific and non-scientific aspects of management, as covered in the Commission's resolution (IWC, 1993). However, it should be noted that at present the Commission has ceased working on the RMS.
[19] *Revised Management Procedure* (*RMP*): This is the scientific part of the RMS (IWC 2012, pp. 483-494).
[20] *Catch Limit Algorithm (CLA)*: this is the process used to calculate the limit for a management area under the RMP.
[21] *Implementation Simulation Trials* (*ISTs*): These are case-specific simulations, the results of which lead to the recommendation of a particular variant of the RMP for a species in a region.

AWMP, whale stocks recovering from over-exploitation, and small cetaceans.

The most appropriate way to conduct a survey and analyse the data will depend on the aims, the species and the region. this document is intended to be an information guide to help those planning surveys to choose the most appropriate methods. It is not prescriptive except where there are requirements under the RMP (section 2.4.2). persons planning surveys not directly involved in providing input to the RMP are also encouraged to take advantage of the experience of the Scientific Committee by submitting plans to the Scientific Committee prior to conducting surveys.

The RMP does not preclude the use of direct methods of estimating absolute abundance other than shipboard or aerial sightings surveys, such as land-based surveys or capture- recapture analyses using photo-identification of natural markings. However, the committee has not yet accepted estimates obtained from these methods for use in the RMP. until the properties of such estimates and the implications for their use in the RMP have been further examined, sightings surveys remain the primary tools for obtaining suitable estimates of absolute abundance for input to the RMP. the guidelines in this document, therefore, are targeted towards the estimation of abundance from data collected on sightings surveys.

To estimate trends in abundance, it is desirable to have consistency in a time-series of estimates. However, the priority from the perspective of the CLA is to reduce bias. thus, changes in survey methodology that reduce bias should not be sacrificed in order to ensure consistency in a time-series. However, collection of data using both the old and new methodologies in order to calibrate estimates is desirable and should be attempted where this is practical.

2.4.1.1 Reference material

These guidelines do not contain an extensive bibliography. Key references are given where appropriate and priority is given to review papers and papers describing the application of methods. a more extensive key-worded bibliography, updated annually, is available from the IWC secretariat.

Important reviews that cover both practical and theoretical aspects of surveys are Buckland *et al.* (1993), Buckland *et al.* (2001) and Buckland *et al.* (2004).

2.4.2 Requirements under the RMS

2.4.2.1 Oversight by the Scientific Committee

The design and conduct of surveys and the verification and analysis of data from such surveys that are intended to provide estimates of abundance to be used in the *CLA* shall be under the oversight of the Scientific Committee to ensure that they adequately follow the requirements described in section 2.4.2 and take into account the guidelines described in sections 2.4.3-2.4.6. the following sub-sections describe the manner in which this shall be achieved. the committee recognises the value of international collaboration and the desirability of participation of scientists representing the committee in the design, conduct and data analysis of surveys intended to provide estimates of abundance for use in the RMP. It encourages interested scientists to collaborate with those planning and conducting surveys and to participate, as appropriate.

2.4.2.2 Notification and planning

plans for survey design and proposed methods of data collection, verification and analysis that are intended to provide estimates of abundance to be used in the *CLA* shall be reviewed by the committee in advance of their being carried out. the committee may make suggestions or recommendations for modification to the plans but prior approval by the committee is not a requirement.

The Secretariat shall be notified of surveys (by giving general information on area, timing and objectives) that are intended to provide such estimates at least 4 months prior to their start. Information on survey design, conduct and data analysis should normally be available for discussion at the Annual Meeting of the Scientific Committee. Final details, including field instructions and data sheets may be agreed at a cruise planning meeting attended by a member of the Scientific Committee or by a Standing Review Committee, where appropriate.

Oversight by the Committee shall be at a level sufficient to ensure that the accepted methods are adequately followed. Depending on the methods to be employed and the experience of those proposing the survey, this may involve: participation in cruise planning meetings, the survey itself and the post-cruise meeting; or determination of a plan to facilitate the work necessary to obtain an abundance estimate in a timely fashion.

2.4.2.3 Survey conduct and personnel

The committee will generally require that scientists familiar with the requirements of the methodology, and especially the implications of violations of survey protocol, participate in the survey. Based on review of the proposed survey plans, including the experience of scientists participating in the surveys, the committee will determine the level of oversight required.

a) For surveys in which the proposers have previous experience in applying the methodology for the species and region being surveyed, the committee will generally specify one of the proposing scientists as its representative to oversee survey conduct;
b) If the proposers request committee oversight, or if the committee judges that the proposers have insufficient experience of conducting the planned surveys, independent oversight by a scientist appointed by the committee will be required to assess the adequacy of survey conduct. In the latter case, the committee recommends that the commission should normally pay expenses associated with this oversight role, including travel, per diem and salary, as required.

Committee representatives should submit independent reports to be considered at a post-cruise meeting or at the following annual meeting of the committee, and/or as specified in any work plan established by the Committee under section 2.4.2.2.

The Committee welcomes the participation of in- dependent scientists knowledgeable in sighting survey conduct and analysis, but will not generally identify specific experience requirements for such participants.

2.4.2.4 SURVEY DOCUMENTATION AND DATA PROVISION AND VERIFICATION

The following documentation shall be provided to the secretariat no later than six months prior to the meeting of the Scientific Committee in which data from the survey are to be used as input to the CLA:

(1) cruise planning report;
(2) field instructions and example data sheets;
(3) cruise summary report;
(4) documentation of any experiments conducted, e.g. to estimate measurement error in distances and angles;
(5) documentation of methods used to estimate distances and angles to sighted groups;
(6) specification of data accuracy verification procedures;
(7) documentation of observations excluded for any reason;
(8) description of analysis methodology planned to be used, including factors or covariates to be used in the derivation of the estimate; and
(9) documentation of additional information related to the conduct of the survey necessary for interpretation of the data.

The data outlined in section 2.4.2.4.1 shall be provided to the secretariat no later than six months prior to the meeting of the Scientific Committee in which they are to be used.

Data shall be provided to the secretariat in fully documented computer readable data files. The Secretariat shall be consulted as to the most appropriate format.

Verification of the data should be carried out by those carrying out the survey. This verification will be audited by the secretariat.

2.4.2.4.1 Outline of data to be submitted to the Secretariat for each survey

the following list illustrates the types of data and level of detail that need to be reported. the exact data items may vary depending on the type of survey.

Cruise information for each survey platform:

(1) vessel/aircraft name and characteristics;
(2) dates of survey;
(3) location of survey;
(4) description of sighting platform(s); and
(5) description of sighting teams and observation schedule(s).

Searching effort records for each transect (or part transect as determined by events and/or sighting conditions):

(1) beginning date, time and position;
(2) ending date, time and position;
(3) geographic stratum;
(4) platform speed and course;
(5) Beaufort sea state (and any other measure of sighting conditions considered appropriate - e.g. glare); and
(6) number and identity of primary observers searching.

Sighting record:

(1) date, time and position when sighting made;
(2) location from which sighting made (e.g. barrel, bridge, co-pilot seat);
(3) identity of observer making sighting;
(4) sighting cue;
(5) distance or inclinometer angle and bearing to sighting, or inclinometer angle and calculated radial or perpendicular distance;
(6) species (and species breakdown if more than one species); and
(7) number of animals in group.

Ancillary data for use in estimation of abundance:

(1) data from experiments to estimate $g(0)$ and other correction factors;
(2) data from dive-time experiments, including those for estimation of surfacing rates for cue-counting estimates of abundance; and data from experiments to corroborate and/or calibrate visual estimates of range to sightings.

2.4.2.5 DATA ANALYSIS

Estimates of abundance presented to the committee shall be accompanied by a full description of methods used in analysis, including documentation of any variations from the description given prior to the survey (section 2.4.2.4 point (8)) and any options chosen in analysis.

Abundance estimates intended to be used in the *CLA* (in contrast to their use in *Implementation Simulation Trials*) must meet the standards required by the RMP. the data and analyses from which the estimates are calculated must be adequately documented to

allow the committee to judge their acceptability for this purpose. the documentation should be sufficient to allow: (i) independent replication of the estimates; (ii) evaluation of the appropriateness of the estimates presented relative to possible alternatives (e.g. model selection procedures, pooling/stratification of the data); and (iii) evaluation of whether the estimates, associated variances and potential biases fall within the ranges used in evaluating the *CLA*. Section 2.4.2.5.1 provides an outline of the minimum level of data summaries and analysis documentation required. The appropriate level of documentation will depend in part on the nature of the survey and the novelty of the analyses.

If any part of the analysis has been undertaken with computer software that is not readily available, a full description and computer programs, including documentation to allow such programs to be validated, shall be provided to the secretariat for eventual validation. the timing of this provision and subsequent validation shall be in accordance with the work plan established by the committee under section 2.4.2.2. readily available software includes the line transect abundance estimation programs contained in the IWC Database and estimation software system, program Distance[22], standard statistical software, and programs previously used and held by the secretariat.

Documented data analysis and results shall be provided to the Secretariat and circulated to the Scientific Committee no later than three months prior to the meeting of the committee in which they are to be used. alternative analyses carried out in response to this shall be circulated no later than two months prior to the Scientific Committee meeting. these timings may be varied to meet the requirements of any work plan established by the committee under section 2.4.2.2.

If alternative analyses are carried out and substantial differences in results are apparent, authors shall try to reconcile or explain such differences and circulate the results via the secretariat at least one month in advance of the meeting. such alternative analyses shall also be carried out in accordance with any work plan established by the committee under section 2.4.2.2.

A previously accepted estimate should be reconsidered by the committee if a major problem subsequently comes to light. the committee should, in due course, also revise previous estimates when methods of analysis are updated or superseded.

2.4.2.5.1 Documentation of data and analysis to be included with estimates of abundance intended for use in the CLA

It is not possible to provide a comprehensive list of the data and analysis documentation needed to cover all issues related to assessing whether abundance estimates are acceptable for use in the *CLA*; this will vary according to the nature of a particular survey or surveys. this appendix therefore simply lists the minimum information the committee would normally expect to receive for estimates from conventional line transect surveys in which $g(0)$ is assumed equal to 1 (in addition to documentation listed under Item 2.4.2.4). substantial additional documentation would be expected for estimates in which $g(0)$ is estimated or for novel methods; this will depend upon the methods used. the committee will provide advice on the required level of information for such cases at the beginning of the *Implementation* process or when preparing for an *Implementation Review*.

(i) *Basic data*

(1) tables of survey effort and frequency histograms of perpendicular distance broken down by covariates that appreciably affect detection probability (e.g. survey block, passing/closing mode, sea state, vessel, as appropriate) including, where appropriate, combinations of covariates used in analysis.
(2) plots showing the realised coverage, by survey mode, in each survey block relative to the planned coverage.
(3) Documentation of the causes of uneven realised coverage within a survey block, if this has occurred.
(4) Tables or figures showing the distribution of school sizes.
(5) plots showing the distribution of radial distances and angles.

2.2.3 Survey design

2.4.3.1 AREA AND TIMING

The RMP requires estimates of abundance for use in the *CLA* from wide areas of ocean. In some cases, wide scale surveys have been conducted but in most cases, for practical reasons, the whole area of interest will not be surveyed at one time. consideration therefore needs to be given to which particular areas should be surveyed in the context of providing the information on abundance needed by the RMP. For example, estimates of common minke whale abundance for the eastern North Atlantic have been obtained from surveys conducted in a single year (Schweder *et al.*, 1997) and also by combining estimates from surveys in different years (skaug *et al.*, 2004).

In cases where whaling may be considered during migration (e.g. north Pacific common minke whales) rather than on feeding grounds, the timing of surveys can also be important.

2.4.3.2 CHOICE OF PLATFORM

the choice of platform for a survey may be determined by factors beyond the control of those designing the survey. For example, the area to be covered may be so large or so remote that it is impossible to survey from any platform other than a ship. If the platform is not predetermined, some points to consider are as follows.

If the prevailing weather is variable but unpredictable over the survey area and it is close to land, aircraft can exploit these conditions more efficiently than ships. The characteristics of the target species of the survey are also important in choice of platform. For example, in an aerial survey, use of the cue counting approach (see section 2.4.5.1) is not appropriate for animals that are usually found in groups of more than three to four animals. Table 2.4.1[To sort - There is no Table 1 (as referred to in the original document)

[22] Program DIstance is available from *http://www.ruwpa.st-and.ac.uk/ distance.*

anywhere in the published Supplement] summarises the platform and methods used to obtain abundance estimates accepted by the Scientific Committee for various species of great whales by geographical area.

Care should be taken to ensure that the platform chosen allows unrestricted viewing of the search area. It is also important to ensure that it is suitable for use in the prevailing conditions in the survey area.

2.4.3.3 CRUISE TRACKS

The first stage is to define the area that is to be surveyed and to which the resultant estimates will apply. In many cases, the most efficient way to survey an area is to stratify it. The shape and size of strata will be determined by physical factors such as the surrounding land masses and limitations on the endurance of the survey platforms. If prior knowledge of the distribution and relative abundance of whales is available, this should be used when delimiting strata. If qualitative or quantitative information on the relative abundance of animals is available, more effort should be devoted to strata of known high abundance e.g. see Fig. 2.4.1.

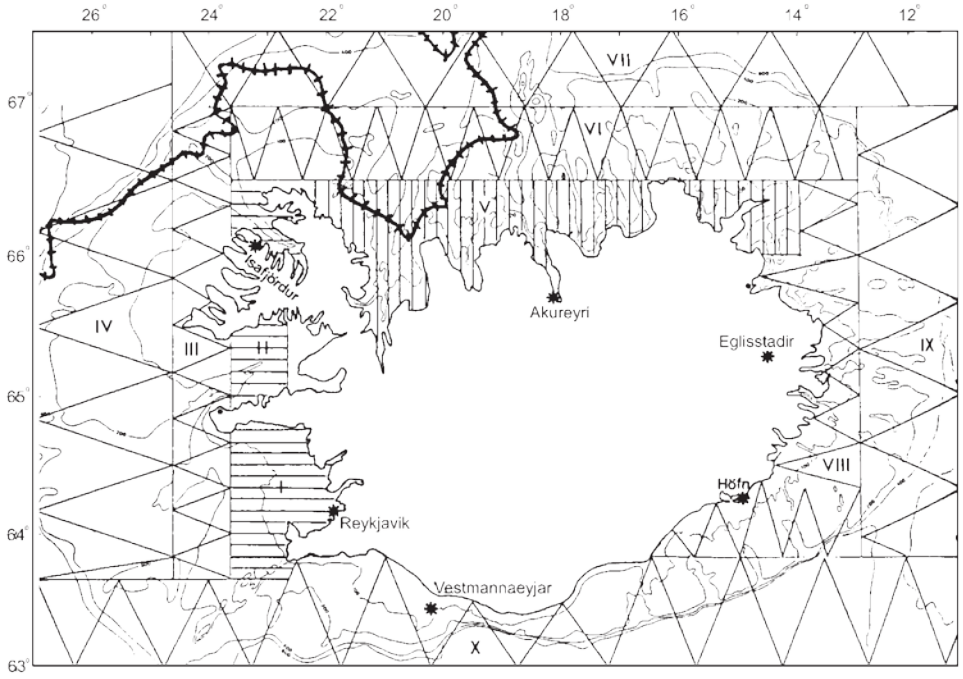


Fig. 2.4.1. Some examples of cruise track design, showing (i) parallel lines, away from the coast, (ii) regular zig-zag lines (iii) higher coverage in areas of higher relative abundance (iv) strata based on oceanography, endurance of the survey platform (in this case an aircraft), oceanography/physical features and previous knowledge of relative abundance and distribution. *RIWC* 44:170 (1994)

Surveys should be designed so that the coverage probability in each stratum is uniform, or close to uniform, or can otherwise be determined. estimates of abundance obtained from a survey design that does not meet this criterion will not be accepted for use in the *CLA* unless they have received prior approval from the Scientific Committee. the aim of a survey should be to maximise searching effort in the area within the resources available. However, this should not be done at the expense of the experimental and calibration work necessary to ensure proper analysis of the data (e.g. estimation of $g(0)$, distance estimation; see section 2.4.4). When determining the length of cruise tracks, due consideration should be given to time that may be expected to be lost as a result of bad weather.

When considering the placement of cruise tracks, care should be taken that they do not follow physical features that may be correlated with whale abundance. For example, cruise tracks should not run parallel to the coastline or to depth contours in the vicinity of shelf breaks but should rather run across such features. Although the 'classical' approach is to place a random grid of evenly spaced parallel lines within each stratum, this can be inefficient if line separation is large, particularly for shipboard surveys. a commonly accepted alternative is to use regular zig-zag lines with a randomly chosen start point. Fig. 2.4.1 provides examples of different types of cruise track design. program Distance will design equal or known coverage probability cruise tracks for defined areas.

If more than one stratum is to be surveyed by different platforms operating at the same time, consideration should be given to the timing of the surveys in order to minimise the difference in time between surveying the area on one side of a stratum boundary and the adjacent area on the other side of the boundary.

If there is a known or suspected migration of whales through the survey area, care should be taken when designing cruise tracks and survey direction to ensure that the data collected are representative. For example, it is clearly inappropriate to survey following the direction of the migration, particularly with a slow moving platform.

2.4.3.4 PERSONNEL

It is essential that survey teams contain at least some personnel who are experienced in conducting sightings surveys for whales. requirements under the RMS are specified under section 2.4.2.3. All personnel should be properly trained in shipboard or aerial procedures and data collection methods including: use of equipment; identification of species; measurement/estimation of angles

and distances; estimation of group size; completion of data forms; and a basic understanding of how the data will be used. cruise leaders should have sufficient knowledge of the analytical methods to enable them to make informed decisions in the face of unforeseen circumstances, e.g. with respect to modification of cruise tracks and coverage due to weather, ice extent etc.

2.4.4 Shipboard surveys

2.4.4.1 METHODOLOGY

Surveys from ships almost exclusively involve line transect sampling methodology. two assumptions of conventional line transect sampling may be particularly problematic with respect to cetacean surveys:

(1) all animals on or close to the trackline are detected (i.e. the probability of seeing animals on the trackline, $g(0)=1$); and
(2) animals do not move in response to the vessel prior to detection.

Estimates of abundance from surveys using conventional line transect sampling may be biased to an unknown extent as a result of violation of these assumptions. the amount of bias depends primarily on the whale species/stock and the survey protocol. the majority of shipboard estimates of abundance accepted by the committee for use in the RMP have been obtained from conventional line transect sampling surveys assuming $g(0)=1$ and no responsive movement. An updated table of accepted abundance estimates and methods used is available on the IWC website (www.iwc.int).

However, a number of methods have been developed to account for animals missed on the trackline and, in some cases, responsive movement. these methods require the use of two teams of observers on independent platforms on the same vessel and the identification of groups, animals or cues seen from both platforms (duplicate identification). methods that require two teams of observers on independent platforms include:

- the independent observer (io) method (Butterworth and Borchers, 1988; Palka, 1995);
- the tracking method (Borchers *et al.*, 1998; Buckland and Turnock, 1992); and
- the hazard probability method (Schweder *et al.*, 1997; Skaug *et al.*, 2004).
- the cue counting approach used on aerial surveys (section 2.2.6) has been attempted on ship surveys but no estimates of abundance accepted by the Scientific Committee for ship surveys have used this methodology (but see Buckland *et al.*, 1993).

Those proposing a survey to generate estimates of abundance for use in the RMP need to determine which method will be used, taking into consideration the target species and the resources available, among other things. For example, if resources are limited and violation of conventional line transect assumptions is not believed to be serious for the target species, it may not be worth the additional complexity and expense of conducting a two- platform survey. the chosen methodology will determine data collection and analytical procedures.

2.4.4.2 METHODS USED BY THE COMMITTEE

This section gives a brief description of the methods that have been used to obtain estimates of abundance that the committee has accepted for use in the RMP.

2.4.4.2.1 IO method

The use of data collected by observers on two platforms on the same vessel to account for animals missed on the trackline was first explored by Butterworth and Borchers (1988) in the context of estimating the abundance of Antarctic minke whales in the southern Hemisphere. Palka (1995) developed the direct duplicate method in estimating the abundance of harbour porpoises in the Gulf of Maine. in IO surveys, teams of observers search independently for groups of animals from two visually and aurally isolated platforms. sightings detected from both platforms (duplicates) are determined in the field or in analysis based on position and time data. data on observations from each platform and the duplicate data are then analysed to estimate $g(0)$ as part of the abundance estimate.

Collecting data from two independent platforms is considered by the committee to be a standard method and estimates of abundance have been obtained from these data e.g for Antarctic minke whales (Branch and Butterworth, 2001). However, in estimates of abundance used by the committee in the RMP, the duplicate sightings data have not been used to correct estimates of abundance for animals missed on the trackline, primarily because of concerns about bias resulting from unmodelled heterogeneity.

2.4.4.2.2 Tracking method

Buckland and turnock (1992) proposed a method to account both for animals missed on the trackline and responsive movement. the method is based on one team of observers (the Tracker team) searching sufficiently far ahead of the vessel to detect groups/animals before they may have responded to it. this team then tracks detected groups/ animals until they are lost or pass abeam of the vessel. a second team (the primary team) searches independently as if conducting a conventional line transect survey and relays information on sightings to the tracker team via radio. a judgement is then made by a 'duplicate identifier' on the tracker team on whether or not each sighting made by the primary team has already been seen by the tracker team. the analysis of data from the two teams and of the duplicate data generate an estimate of abundance that accounts both for animals missed on the transect line and, if animals are seen before they respond, for responsive movement. this method has been extended by Borchers *et al.* (1998) and used to estimate the abundance of harbour porpoises, white- beaked dolphins and common minke whales in the North Sea and adjacent waters (Hammond *et al.*, 2002).

2.4.4.2.3 Hazard probability method

The Hazard probability method takes as its starting point that because minke whales surface for very short periods they are observable only at discrete points in time. the method treats the sighting process as a point process in space (representing the locations of individual whales), time (representing the surfacings of the whales), and a sequence of Bernoulli experiments representing whether or not a whale was observed at a given surfacing. the probability of success in these Bernoulli experiments is called the hazard probability and is the conditional probability of detecting a whale given that the observer was previously unaware or it. In practical terms, the method requires that teams of observers searching from two independent platforms track sighted whales and record data on the time, angle and radial distance of each surfacing in a track. Because neither team is aware of the others' sightings, duplicate identification is not undertaken in the field.

The Hazard probability depends on the position of the whale relative to the observer and on other covariates such as Beaufort Sea state, visibility, observation team, etc. parameters of the hazard probability are estimated by maximum likelihood methods, with the likelihood function evaluated partially by stochastic simulation, incorporating dive-time data from radio-tagged whales. the likelihood function consists of two parts, one based on the recorded initial position of the sighted whales, and the other based on the double platform data. Before calculating the likelihood function, the double platform data are processed through a duplicate identification routine incorporating a measurement error model.

The method is analytically complex and computationally intensive. Schweder *et al.* (1997) and Skaug *et al.* (2004) describe the application of this method to the estimation of common minke whale abundance in the northeastern North Atlantic.

2.4.4.3 COMMON CONSIDERATIONS

A number of important considerations are common to all shipboard line transect methods. A good source of detailed information on these and other aspects of conducting sightings surveys is the document providing Information for Researchers on the IWC SOWER Circumpolar Cruises (available at https://iwc.int/sower).

2.4.4.3.1 'Passing' versus 'closing' mode

When a sighting is made by an observer, either (i) data on the sighted group can be collected and recorded as searching continues (passing mode) or (ii) searching can cease while the group is approached to confirm species identification and estimate group size (closing mode). there are advantages and disadvantages to both methods.

Closing mode results in a low proportion of groups unidentified to species or without group size estimates but can result in an under-representation of searching effort in areas of high whale density. this is because the time taken to close with sightings may substantially reduce the time left for searching and because primary sightings may be missed that would otherwise have been seen. conversely, passing mode eliminates possible bias as a result of this, but can result in a higher proportion of sightings unidentified to species or without group size estimates.

The most appropriate method for a particular survey will depend on the species and region to be surveyed. Many surveys now use 'modified closing mode', whereby sightings are only closed with where necessary to confirm species and/or school size (this applies only to target species - passing mode is always applied to non-target species). In other surveys, a combination of both methods has been used at different times.

On two-platform surveys, the procedures for using closing mode depend on the particular method (see section 2.2.4.3.6).

2.4.4.3.2 Searching effort data

Searching effort data should be collected and recorded in a disaggregated form to allow the recalculation of estimates of abundance if boundaries of management areas are altered. changes in Beaufort Sea state and other indicators of sighting conditions should be recorded to allow the data to be stratified by these variables where appropriate.

2.4.4.3.3 Estimates of angle and distance to a sighted group of whales

Line transect sampling assumes that data are accurate. Distance and angle data are particularly important and training observers in the collection of these data should be conducted, preferably at the start and during surveys, in the interests of obtaining the most accurate positional data possible.

It is essential that angles to sightings are recorded accurately, to the nearest degree angles should be determined using a form of 'angle board' or equivalent equipment to avoid the tendency to round angles to convenient values.

The estimation of distance at sea is particularly difficult. subjective estimation by eye of distance to sighted groups may be used provided that adequately documented experiments are conducted on each vessel to enable corroboration or calibration of the distance estimates. If a practical technology for objective distance estimation or for aiding subjective distance estimation is available and can be demonstrated to be appropriate (e.g. distance 'sticks', reticule binoculars, video range-finding equipment (Leaper and Gordon, 2001), it should be used in preference or in addition to subjective distance estimation.

Angle and distance experiments should be carried out, if possible, before, during and after the survey. methods that allow accurate determination of the angles and distances to the target objects, simultaneously with the estimated angles and distances, should be implemented. estimates of angles and distances should be made on command and not in the observers' own time.

The observer making the estimates should be identified both in the calibration experiment data and in the survey data. Determination of the best design and conduct of these experiments will depend on the application. one factor to be considered is obtaining a sufficient range of combinations of angles and distances, bearing in mind typical distributions of angles and distances obtained

during the survey.

2.4.4.3.4 Species identification and estimation of group size

For a sighting to be used in calculating estimates of abundance, the species must be identified with certainty and the number of whales in the group must be counted or estimated. to ensure that these data are recorded accurately, survey personnel must include scientists or observers experienced in conducting sightings surveys for whales (section 2.2.3.3).

If a large group of whales is encountered it may be unclear whether it consists of one or more groups for the purposes of recording sightings data. The field instructions should include guidance notes on how such cases should be handled.

2.4.4.4 INDEPENDENT OBSERVER DATA

Estimation of *esw* on surveys where $g(0)$ is not assumed to be one involve the collection of data by observers searching simultaneously from two platforms on the same vessel. These data are known as independent observer (io) data because the observers on the two platforms search with one- way or two-way independence, depending on the method employed. io data should be collected as an integral part of the survey; this ensures that they are representative and may also improve sighting efficiency.

If independent observer data are collected to allow the estimation of $g(0)$, these data and documentation of the data collection methods shall be submitted to the secretariat (section 2.2.2).

Estimates of abundance from io data corrected for animals missed on the trackline are biased by unmodelled heterogeneity in detection probability. It is important, therefore, that data on variables that affect detection probability be recorded as far as possible, and for all sightings.

2.4.4.4.1 Duplicate identification

Analysis of IO data depends critically on the ability to identify duplicate sightings of the same group, animal or cue made by observers on different platforms. judgements on duplicate identification can be made in the field during data collection or later during analysis. In the latter case, recording the time at which a group or cue was made is essential. use of electronic recording devices is critical for obtaining accurate sighting times of individual groups or cues, and hence reliable duplicate identification. in some circumstances it will not be possible to record accurate times, even when electronic recording devices are used. It is important that there is a facility for identifying which sighting do not have associated accurate times.

If duplicate identification is undertaken during analysis, it should be done on the basis of an objective rule and not by subjective judgement. the criteria used for duplicate judgement should be specified as explicitly as possible, the object being to make each duplicate decision intelligible to someone not involved in the actual decision making.

2.4.4.4.2 Tracking procedures

Where the survey protocol and analysis requires tracking of groups/animals after their initial sighting, tracking teams should consist of more than one observer. When one member of a team starts tracking, the operational procedures for the other observer(s) should be explicit.

Data records for each group/animal tracked should contain some information on the level of certainty that the resightings are of the same group/animal. For example, if there were uncertainty whether or not a particular cue in the series was from the group/animal being tracked, this should be indicated.

There may be a trade-off between obtaining complete tracks from both platforms for reliable duplicate identification on the one hand, and maximising sighting efficiency by not diverting search effort into tracking sightings on the other hand. the problem is more severe when survey procedures are such that animals remain in the field of view for long periods of time than when they are potentially (re)sightable for a short period only. more work needs to be done before the nature of this trade-off is properly understood.

2.4.4.4.3 Direction of movement of detected animals

Information on the direction of movement of groups/animals can help in duplicate identification and can also allow investigation of bias resulting from responsive movement (e.g. Palka and Hammond, 2001). this information should be recorded for each detected sighting of a group, animal or cue. the recorded direction can be with respect to either the trackline (possibly using a pointer mounted on an angle board) or to line of sight.

2.4.4.4.4 Group fragmentation and formation

When tracking, group fragmentation (when a previously detected group splits into more than one group/animal) and group formation (when more than one previously detected group/animal join together to form a single, larger group) should be explicitly recorded. Data forms should be designed to accommodate the recording of these data. the number of animals associated with a (re)sighting should always be recorded. Where cues are recorded rather than groups/animals, explicit criteria for recording more than one cue as a single (re)sighting should be specified and used in recording data. For example, cues from different animals in a single group should be recorded as a single (re)sighting if they occurred within a specified small time period of each other.

2.4.4.4.5 Additional data

Each (re)sighting record in the data forms should have field for additional data, such as details of group/animal behaviour.

2.4.4.4.6 Closing with IO mode surveys

If animals are closed on, this should be done in a way that does not compromise the collection of io data. For example, if analysis is group-based rather than cue-based, closing should be delayed until either the group has been detected by observers on both platforms (2-way independence) or the primary platform (Bt method), or it has passed abeam. If analysis is cue-based then closing need only be delayed until observers on both platforms have had sufficient opportunity to detect a cue seen from one of them.

2.4.5 Aerial surveys

2.4.5.1 METHODOLOGY

Although conventional line transect methods used on shipboard surveys can also be used on aerial surveys, the high searching speed of aircraft means that the probability of missing a sighting on the transect line is much greater than for a shipboard survey. even if $g(0)$ can be estimated without bias, it is likely to increase the estimate of abundance several- fold so that the variance of the estimate will be dominated by the variance of the estimate of $g(0)$.

A preferable method for some species is cue counting. this approach assumes that every cue (e.g. blow, dive) directly below the aircraft is seen, not that every animal on the track line is seen as for line transect surveys. a cue is, by definition, at the surface so the problem of submerged animals is removed. the density of cues per unit of time is estimated and converted to an estimate of whale abundance using an estimate of cue rate. the approach is thus dependent on a good estimate of cue rate. cue counting relies on the distance to every cue sighted being recorded. It is therefore unsuitable for species that are regularly found in groups of three-four or more (i.e. where many cues may occur in quick succession).

Aerial survey cue counting estimates accepted by the Scientific Committee are all from the north Atlantic. A full account of the analyses of the data is given in Hiby *et al.* (1989).

2.4.5.2 SEARCHING EFFORT DATA

The same guidelines apply here as for shipboard surveys (section 2.4.4.3.2), irrespective of whether the cue counting or line transect approaches are adopted. most aircraft employ GPS equipment to determine position (this is recommended for safety as well as scientific reasons) and it is possible to download position and time information directly onto a computer.

2.4.5.3 POSITION OF THE CUE/SIGHTING RELATIVE TO THE TRACKLINE

Distance can be accurately determined using an inclinometer to measure the angle from the horizontal to the sighted cue or group. In line transect sampling this is typically done when the sighting comes abeam of the aircraft to give perpendicular distance directly.

cue counting does not require perpendicular distances to be determined; it is the radial distance to each cue that must be accurately recorded. the observer must record the exact time the cue is sighted and the exact time the inclinometer angle is obtained (to the nearest second). the most appropriate data recording method to achieve this is to use a voice activated tape recording system with an in-built time signal. the altitude, speed and drift angle of the aircraft are also required to estimate the position of the cue. angles from the trackline need only be recorded approximately (to the nearest 10°) to determine if the cue falls within the scanning sector (usually 90° from the trackline on either side of the aircraft) and to aid in separating one cue from another if seen simultaneously. In most cases, the time of the cue (to the nearest second) is sufficient to distinguish between cues.

2.4.5.4 SPECIES IDENTIFICATION AND ESTIMATION OF GROUP SIZE

the same guidelines apply here as for shipboard surveys (section 2.4.4.3.4). although estimation of group size is not necessary if cue counting methods are used, the general value of such information makes it useful to record, especially given the relative ease of its collection.

2.4.5.5 INDEPENDENT OBSERVER DATA

As noted in section 2.4.5.1, estimation of $g(0)$ is essential if line transect sampling is used in aerial surveys. methods have been developed for aerial surveys (section 2.4.7) but there are no estimates of abundance accepted by the committee that have used these methods.

In the cue counting method, independent observer data are used to estimate the probability of sighting a cue directly beneath the aircraft, to assess the accuracy of estimates of radial distance and to help evaluate observer differences.

2.4.5.6 ESTIMATION OF CUE RATE

The estimation of cue rate is essential to the use of the cue counting approach for assessment purposes. this must be obtained separately as it is impractical to collect such data during the survey. such experiments have usually been carried out from vessels either relying on visual observations or using radio tags. It is important that efforts be made to minimise any effects of vessel presence on the 'cueing' behaviour of the animals. In some cases it has been possible to carry out such experiments from land.

The following factors potentially affecting cueing rates need to be considered in any such experiments:

(1) time of day (e.g. morning, evening);
(2) behaviour of animals (e.g. feeding, travelling);
(3) group size;
(4) effect of vessel (e.g. avoidance, curiosity);
(5) sea state/weather conditions (these may affect the sightability of the cue and/or the behaviour of the animal(s) - use of radio tags will minimise this); and

(6) geographical location/stock identity (it is important to try to carry out experiments in the locality of the survey).

2.4.6 Analytical considerations

The methods described in sections 2.4.3-2.4.5 are based on robust statistical analysis of specific data that are required to be collected in the field. it is imperative, therefore, that those planning surveys to provide estimates of abundance intended for use in the RMP involve experienced analytical scientists from the beginning of the process. surveys that are designed and conducted based on a full understanding of how the data are to be analysed will be much less likely to suffer from analytical problems when abundance is estimated.

2.4.6.1 VARIANCE ESTIMATION AND THE CLA

Simulation trials show that the performance of the *CLA* can be degraded when the abundance estimates have high true coefficients of variation (e.g. CV>0.8) but the estimates of the CV of the abundance estimates have themselves a very high variability so that estimated CVs may be low. The latter situation can arise when survey effort has been very small, which may result in very few transects upon which to base a CV estimate. under these circumstances the *CLA* may be misled if a time-series of estimates is input whose true CV s are high but whose estimated CV s are either substantially negatively biased or have themselves very high variances.

It is therefore important that underestimation of the CV of abundance estimates be avoided and that the estimator for the CV of an abundance estimate should not have an excessively high variance.

Accordingly, a CV estimate should take into account, to the extent possible, all major sources of observation error[23]. A CV estimate should never be less than that which would be obtained by treating the number of sightings (of groups of animals) as a random variable with a Poisson distribution whose mean is equal to this number of sightings. In most cases it will be considerably more than this. A CV estimate based on the observed inter-transect variance should not normally be calculated from less than four transects. In cases of doubt one should err on the side of overestimating the CV of an abundance estimate to be used with the *CLA*.

These guidelines do not apply to zero estimates, which occur when no sightings are made on primary effort during a survey. this should not occur often, but zero estimates should not be ignored when they do occur. It is not normally appropriate to attempt to estimate the variance or CV of a zero estimate, but an alternative variance-related statistic can be calculated for use with the *CLA* of the RMP. In the case of zero estimates, a statistic that errs on the side of underestimating the variance of the estimate is acceptable, such as the one described in annotation 29 to the RMP (see, section 2.1 and IWC 2012, p. 493).

2.4.6.2 SIMULATION TECHNIQUES

The committee has noted the importance of using simulation techniques to evaluate the performance of any abundance estimator (IWC, 1996a, p.58). simulations should be carried out to provide sufficient information to indicate the basic statistical properties (e.g. bias and precision) of the abundance estimators and their variance. generic simulation testing can provide an indication of satisfactory performance, but it is important to conduct simulations that are appropriate for specific applications. A number of factors relevant to the design and conduct of simulation testing have been identified (IWC, 1996b, pp.180-1).

In 1996, the committee considered the application of simulation testing to hazard probability methods in the estimation of northeast Atlantic common minke whale abundance (IWC, 1997). since then, the committee has overseen the development of a substantial number of simulated datasets suitable for evaluating the performance of a variety of abundance estimators. the current simulated data are designed to represent features of minke whales in the North Atlantic and the southern Hemisphere and the protocols used on surveys of these species (Palka and Smith, 2004).

2.4.7 Other methods not yet reviewed by the Committee

Methods for estimating abundance are continually developing. the committee encourages the presentation of new methods that could be used for obtaining estimates of abundance suitable for use in the *CLA*. methods that have been developed in recent years include spatial modelling (e.g. Hedley *et al.*, 1999), accounting for responsive movement (Palka and Hammond, 2001) and the tandem aircraft and circle-back aerial survey methods (Hiby, 1999; Hiby and Lovell, 1998).

Before estimates of abundance obtained from such new methods can be accepted for use in the RMP, the properties of such estimates and the implications for their use in the *CLA* may need to be examined by the committee.

2.4.8 References

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[23] Observation error is the sampling error arising from the survey methods and design. the level of observation error is inversely related to the amount of survey effort, provided that the survey is well designed.

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2.5 Draft Guidelines for Aboriginal Subsistence Whaling Management Procedure *Implementation Reviews* [CURRENTLY UNDER REVISION. **DONOVAN**]

2.5.1 Objectives of Implementation Reviews

The primary objectives of an *Implementation Review* are to:

(1) review the available information (including biological data, abundance estimates and data relevant to stock structure issues) to ascertain whether the present situation is as expected (i.e. within the space tested during the development of a *Strike Limit Algorithm* (*SLA*)) and determine whether new simulation trials are required to ensure that the *SLA* still meets the Commission's objectives; and

(2) to review information required for the *SLA*, i.e. catch data and, when available at the time of the *Review*, new abundance estimates (note that this can also occur outside an *Implementation Review* at an annual meeting).

2.5.2 Timing of Implementation Reviews

2.5.2.1 Regular Implementation Reviews

Implementation Reviews are undertaken regularly, normally every five years. This does not have to coincide with the renewal of catch/strike limits in the commission. For logistical and resource reasons, only one major *Implementation Review* shall be undertaken at a time. the committee shall begin planning for the *Review* at the annual Meeting at least two years before the Annual Meeting at which the *Review* is expected to be finished. this is to enable the committee to schedule additional work or Workshops if it believes that new information or analyses are likely to be presented that will necessitate the development of new simulation trials. Early planning will enhance the likelihood that the committee will complete an *Implementation Review* on schedule. It is not expected that every *Implementation Review* will entail a large amount of work.

2.5.2.2 Special Implementation Reviews

In addition to regular *Implementation Reviews*, under exceptional circumstances the Committee may decide to call for special *Implementation Reviews*, should information be presented to suggest that this is necessary and especially if there is a possibility that the Commission's conservation objectives may not be met.

Calling such a *Review* does not necessarily mean revising the Committee's advice to the Commission, although it may do so. the committee has not tried to compile a formal comprehensive list of what factors might 'trigger' such an early review, which implies unexpected/unpredictable factors. However, the following list is provided to give examples of some possible factors.

(1) Major mortality events (e.g. suggested by large numbers of stranded animals).

(2) Major changes in whale habitat (e.g. the occurrence of natural or anthropogenic disasters or changes, an oil spill, dramatic change in sea-ice, development of a major oil/gas field, etc.).

(3) Major ecological changes resulting in major long-term changes in habitat or biological parameters.

(4) A dramatically lower abundance estimate (although the SLA has been tested and found to be robust to large sudden drops in abundance, the committee would review the potential causes of unexpected very low estimates).

(5) Information from the harvest and hunters (this might include very poor harvest results, reports of low abundance despite good conditions, reports of large numbers of unhealthy animals).

(6) Changes in biological parameters that may result in changes to management advice (e.g. reproduction, survivorship).

(7) If there are cases when need is not being satisfied, strong information that might narrow the plausibility range and allow an increase in block limits.

(8) A new harvest regime (e.g. the potential hunt of gray whales by the Makah Tribe on the west coast of the usa).

2.3.3 Outcomes of Implementation Reviews

There are a number of possible conclusions of *Implementation Reviews:*

(1) there is no need to run additional trials and that the existing *SLA* is acceptable;

(2) the results from the additional trials developed and run reveal that the existing *SLA* is acceptable;

(3) there is no need for any immediate additional trials or changes to management advice but work is identified that is required for consideration at the next *Implementation Review*; or

(4) the results of the additional trials require the development of a new (or modified and then retested) *SLA* in which case management advice will have to be reconsidered until that work is complete.

2.5.4 Data availability

Implementation Reviews fall under the Committee's Data Availability Agreement Procedure A (IWC, 2004). By the time of the annual meeting prior to that at which the *Implementation Review* is expected to be completed, the scientists from the country or countries undertaking the hunts, or others intending to submit relevant analyses, shall develop a document or documents that explains the data that will/could be used for the *Implementation Review*. such a document will:

(a) outline the data that will be available, including by broad data type (e.g. sighting data, catch data, biological data): the years for which the data are available; the fields within the database; and the sample sizes.

(b) provide references to data collection and validation protocols[24] and any associated information needed to understand the datasets or to explain gaps or limitations; and

(c) where available, provide references to documents and publications of previous analyses undertaken of data.

The data themselves shall be available in electronic format one month after the close of that annual meeting.

In the case of complex *Implementation Reviews* that may last more than one year and involve one or more workshops, new data can be submitted, provided that the data are described and made available at least nine months before the annual meeting at which the *Implementation Review* is expected to be completed.

2.5.5 Computer programs

All non-standard programs used in analyses submitted to the *Implementation Review* shall be lodged with the secretariat at least at the same time (in accordance with the time schedule provided in DAA procedure a) as the submission of the papers to which they pertain. The Committee may decide that the programmes need independent validation.

All final trial runs shall be undertaken by the Secretariat using validated programmes.

2.5.6 References

International Whaling Commission. 2004. Report of the Scientific Committee. Annex T. Report of the data availability working group. *J. Cetacean Res. Manage. (Suppl.)* 6:406-08.

International Whaling Commission. 2009. Report of the Scientific Committee. Annex I. Report of the working group on stock definition. Appendix 2. Guidelines for DNA data quality control for genetic studies relevant to IWC management advice. *J. Cetacean Res. Manage. (Suppl.)* 11:252-56.

2.6 Guidelines for DNA data quality control for genetic studies relevant to IWC [CURRENTLY UNDER REVISION. IT WILL BE PUBISHED IN THE JOURNAL: **LANG and TIEDEMAN / DONOVAN**]

As genetic data are frequently applied to give advice to the IWC (including, but not limited to, detection of population structure), there is a need to agree on data quality criteria for currently used DNA marker types (sequences, microsatellites, Single Nucleotide Polymorphisms (SNPs); possibly nuclear DNA sequencing in the future). The guidelines and considerations on DNA quality provided here represent common practice subject to ongoing discussion and will need future adaptation, as the state-of-the-art of DNA analysis in population genetics progresses.

It is also evident that, although accordance to these guidelines is highly desirable, this does not preclude consideration of genetic work failing to fully meet these standards. Nonetheless, the issues raised below are intended to assist Scientific Committee members in judging the respective reliability of information from genetic studies. In addition, for studies explicitly carried out to give stock

[24] Genetic data must follow the quality control guidelines developed by the Scientific Committee in 2008 (IWC, 2009).

definition advice to the IWC, adherence to these guidelines is strongly recommended.

It was identified that the quality of DNA data-based management critically depends on three issues:

1) Experimental design (including appropriate sampling scheme with regard to sample size and geographic coverage);
2) Procedural implementation of sample handling and molecular analysis (including labelling, archiving, and data quality checks); and
3) Appropriate data analysis and interpretation to provide management advice.

Although consideration of guidelines for all these issues are recommended, these guidelines are restricted to explicit coverage of the quality of DNA data. As such, this Appendix mainly deals with awareness, minimisation, and control of DNA typing errors. As true error rates are hard to estimate, it is evident that most efforts to assess error rates are in fact identifying inconsistencies in data sets. Nevertheless, for simplicity in what follows we will use the term 'errors' to include inconsistencies in scoring and recording genotypes. Our objective is to provide a general procedural outline regarding how to qualitatively ensure and report DNA data quality, but (at this step) not to provide quantitative suggestions for benchmarks in quality control. Whenever possible, this Appendix shall refer to established published procedures.

Generally, errors can be introduced at various points of a DNA study (Fig. 2.6.1) and fall into three different primary categories:

1) difficulties in reliable genotyping due to locus characteristics;
2) insufficient tissue or DNA sample quality; and
3) inconsistency of methods, lack of adherence to standards of Good Laboratory Practise (GLP).

Item (1) calls for marker validation (often addressed in a pilot study)**,** while Items (2) and (3) are addressed by implementing a systematic quality control throughout the entire study.

2.6.1 Marker validation

2.6.1.1 MICROSATELLITES

Microsatellite data quality can be affected by repeat complexity, the number of alleles, the size range of alleles, tendency of microsatellite PCR products to 'stutter' (produce multiple peaks adjacent to the 'true' peak (van Oosterhout *et al.*, 2004) or be adenylated (also called 'plus-A'), and variation in experimental conditions (Davison and Chiba, 2003; LaHood *et al.*, 2002). To validate a microsatellite locus, the characteristics of the repeat type need to be verified by DNA sequencing in the species to be analysed. This is particularly important for the plausibility check on allele length during allele calling (see below). A pilot study should then investigate reliability of amplification and identify technical problems e.g. localisation of adenylation peak, null alleles, frequent allelic dropout (Goossens *et al.*, 1998; Tiedemann *et al.*, 2004). The pilot study should include all relevant sample populations and a sufficient sample size per putative population to permit a statistical test of Hardy Weinberg Equilibrium (HWE) expectations. A consistent deviation from HWE can be an indicator of such technical problems, although HWE departure can also have biological reasons. In addition, the genotypic data should be examined for patterns of linkage disequilibrium (LD; non-random associations of alleles at different gene loci). Like departures from HWE, LD can result from a variety of biological factors as well as artefacts or errors. LD occurs due to genetic drift in all finite populations, and the magnitude of LD can be used to estimate population size. However, many analyses depend on the assumption that different loci are independent. Analysis of LD can identify locus pairs that are consistently out of equilibrium (linked), in which case this should be accounted for in subsequent analyses of the data (e.g. by dropping one of the loci from the analysis if independence is assumed). Both HWE and LD can be examined using a variety of software packages, e.g. GENEPOP (Raymond and Rousset, 1995); FSTAT, etc. It should be noted that deliberately using HWE departure for error detection may have an impact on later population genetic analyses and conclusions. For instances, if genetic markers are removed from the data set because they showed significant deviations from the expected HWE genotype frequencies, then later conformation with HWE is likely due to the selection of markers, and not related to the underlying population genetic structure. In addition, tests of HWE and LD often involve multiple tests of the same hypothesis. In these applications, it is common practice to use a correction for multiple testing, such as the Bonferroni correction, in which the critical P value is inversely proportional to the number of tests. This correction is known to be conservative and hence will fail to detect some departures from the null hypothesis. If a multiple testing correction is performed, a better option is to use the false discovery rate (e.g. Garcia, 2003), which adjusts for multiple testing without sacrificing as much power as the Bonferroni correction. In addition, it is recommended that results are also presented for unadjusted tests, as the distribution of unadjusted P values provides valuable information about agreement with the underlying null hypothesis.

There are established routines to assess marker quality that can be used to decide whether markers should ultimately be included or excluded from analysis (Givens *et al.*, 2007). If the marker appears unreliable at this stage, it should not be used. When preliminary analyses identify marker quality to be questionable but not obviously poor, analysis of data with and without that marker can help to determine whether a single marker is causing a particular result.

2.6.1.2 MITOCHONDRIAL DNA (MTDNA)

If using primers not validated in the species to be studied, the mitochondrial origin should be demonstrated. In particular, the possibility of erroneously sequencing nuclear pseudogenes (Numts-Lopez *et al.* (1994); Benssason *et al.* (2001)) should be ruled out, as Numts are pervasive in some species (e.g. *Tursiops sp*. – Dunshea *et al*. (2008)) and can easily be mistaken for actual

mitochondrial haplotypes, potentially leading to false inference of population structure or other analysis errors. Several methods have been described that can in most cases help to identify Numts (Bensasson *et al.*, 2001; Dunshea *et al.*, 2008; Lopez *et al.*, 1994). After identification of Numts, primers should be re-designed such that they specifically amplify mtDNA (Tiedemann and von Kistowski, 1998). Generally, sequences should be compared to GenBank (BLAST) and run through DNA surveillance routines, when available. Note, however, that GenBank itself lacks a stringent control of sequence authenticity, such that additional sequence validation might be necessary.

2.6.1.3 Single Nucleotide Polymorphisms (SNPs)

For sequence analysis of SNPs, sequence quality checks outlined below generally apply. Other SNP technologies (SNaPshot, quantitative PCR) are not covered here, as they are so far not very common in IWC-related studies.

2.6.2 Systematic quality control and assessment

2.6.2.1 Assessing sample quality prior to genetic analysis

For many genetic studies, variation in sample quality (e.g. degraded samples from stranded animals, non-invasively collected samples such as faeces and sloughed skin, samples degraded from long-term storage or improper handling, co- purification of inhibitors, potential contaminants, etc.) will be a factor. Many publications discuss methods to assure data accuracy for samples known to be of poor quality (McKelvey and Schwartz, 2004; Morin *et al.*, 2001; Navidi *et al.*, 1992; Paetkau, 2003; Taberlet *et al.*, 1996) and the need to estimate error rates (Bonin *et al.*, 2004; Broquet and Petit, 2004; Morin *et al.*, 2007). Analysis of DNA sample quality prior to genetic data generation can ensure, for example, that low quality (and therefore highly error prone) samples are either removed from the study or replicated sufficiently to ensure accuracy. This is particularly important for studies involving sample types that are likely to be of poor quality (e.g. non-invasive fecal samples, sloughed skin, poorly preserved and historical 'ancient DNA' samples); (McKelvey and Schwartz, 2004; Morin *et al.*, 2001; Morin and McCarthy, 2007; Paetkau, 2003; Taberlet *et al.*, 1996). Indeed, the presence of even a single poor quality sample in a small population sample can result in false inference of population structure (Morin and LeDuc, 2004; Morin *et al.*, 2007).

Where problems are detected with particular samples or where quality issues are expected, it is strongly recommend that samples are pre-screened for DNA concentration and quality (i.e. degree of degradation, presence of inhibitors) prior to beginning a study with nuclear markers. Purification of DNA for PCR can co-purify PCR inhibitors (Hoelzel, 1992) and this varies for different tissues (e.g. cetacean skin extracts may amplify better at lower concentrations due to these contaminants). When samples are expected to meet a minimum threshold level of DNA (e.g. 20ng per PCR reaction), quantification by absorbance or fluorescence spectrophotometry (e.g. Pico Green) can be rapid and inexpensive, allowing sample concentrations to be normalised to produce consistent results. When samples are expected to be of low quality or concentration, more sensitive methods such as quantitative PCR (qPCR) can provide highly accurate data on DNA concentration, and even on relative abundance of DNA at multiple fragment sizes, to optimise sample selection and data replication criteria (Morin *et al.*, 2001; Morin *et al.*, 2007; Morin and McCarthy, 2007). When DNA concentration is low, potential for contamination is increased. When multiple pieces of sloughed skin are stored in the same vial, the chances for cross-contamination is also more likely. When DNA is fragmented it is advisable to target smaller microsatellite or smaller mitochondrial amplicons.

2.6.2.2 Ensuring consistent data generation

During the analysis, the following measures are recommended (Roman numbers as in Fig. 2.6.1)

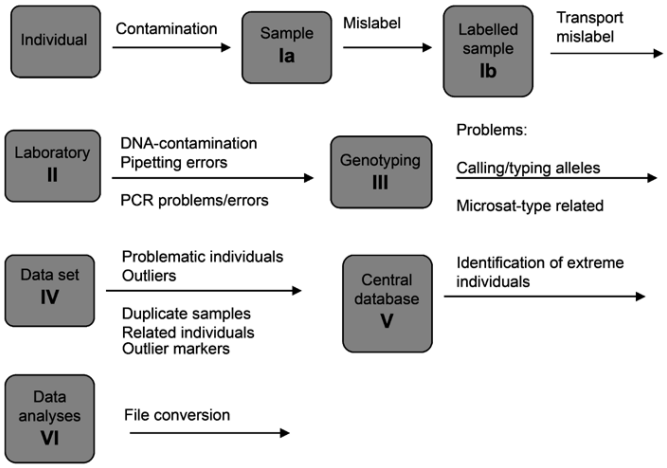

Fig. 2.6.1. Flow chart of DNA analysis procedures and potential error sources. Roman numbers refer to suggestions for quality control below.

2.6.3 Sampling

Preferentially provide prelabelled (numbered) sample vials prefilled with appropriate storage buffer to the field worker. Provide explicit easy-to-read instructions for contamination-minimising sampling. It is essential that each sample is uniquely identified. Methods for insuring that samples are uniquely identified can include: Providing prelabelled (numbered) sample vials (barcoded, if possible), providing a pre-numbered data sheet against which sample numbers are checked off as vials are filled, etc. Double-label

every vial with waterproof pen, do not use tape for labelling (might fall off later on). It is advisable to start with the vial with lowest number and strictly following numbers, such that they reflect order of sampling.

I. **Sample handling**. Establish standardised procedure for receipt of samples at the analytical laboratory. In particular, create data base entry with field number and unambiguous lab number. Double check data entries to minimise transcription errors. It is advisable to have a backup whenever possible, so samples can be divided and sub-samples kept in separate storage locations (i.e. when samples are shared between laboratories or before shipping samples from a remote location).

II. **Laboratory practice**. Work according to established procedures for GLP (e.g. Seiler, 2005). Establish standardised routine to avoid mislabelling of tubes in the process of genotyping. Electrophoretic migration can be affected by both size and nucleotide composition of the alleles, as well as the addition of fluorescent molecules for visualisation although this is less of a problem when using modern capillary analysers. Allele sizes can differ by more or less than the size of the microsatellite repeat unit (e.g. a CA repeat can have alleles that differ on average by 1.8-2.2bp); (Amos *et al.*, 2007). In addition, electrophoresis is itself variable, and can cause allelic size differences of up to 7bp across time, technologies, and instruments (Davison and Chiba, 2003; LaHood *et al.*, 2002). Several methods have been introduced to facilitate normalisation of alleles, but all require that controls are run to verify that alleles are correctly sized (Amos *et al.*, 2007). It is advisable to maintain all original data for reanalysis, and periodically check consistency of allele calling ('binning') for a subset of samples by double-blind genotype calling involving at least two persons. It is good practice, when inconsistencies are found or when starting to use new microsatellite primers (especially on a different species), to compare allele calling to absolute length information by sequencing (part of marker validation, see above).

III. **Check data for consistency and plausibility**. For microsatellites, use quality control software (e.g. MICROCHECKER), (van Oosterhout *et al.*, 2004) to check for null alleles and stutter/short allele dominance effects. Be aware of that (1) such analysis packages do not necessarily find all potential errors and (2) non-rejection of the null hypotheses about non-existence of these effects can also originate from lack of statistical power; check HWE and, if heterozygote deficiency occurs, inspect data for rare allele homozygotes; check for plausibility of allele calls (referring to known repeat characteristics, see above; e.g. a tetranucleotide microsatellite should be expected to typically yield alleles differing by multiples of 4). Individual samples with unusual characteristics warrant extra scrutiny to verify genotypes, as these samples are both more likely to contain errors and more likely to bias analytical results. A simple analysis of the number or percentage of homozygous genotypes per individual can rapidly identify individuals likely to have experienced high levels of allelic dropout. Plotting the values indicates which samples are outliers from the general population, so that genotypes can be replicated to correct seemingly homozygous genotypes that are due to 'allelic dropout' (failure to amplify one of the alleles in a heterozygote, usually the larger fragment). A similar approach can be used to evaluate the distribution of missing data points across individuals and markers. If data do not appear plausible after retyping, repeat entire typing starting with new DNA extraction from back-up sample, eventually sequence microsatellite in this specimen. For mtDNA sequences: sequence both strands (not required, but highly recommended), check quality of sequence with regard to ambiguous (mixed) bases, uneven spacing between bases; check sequence in BLAST for authenticity; check polymorphisms for plausibility (e.g. identify sequences which might show far more than expected polymorphisms and/or a bias towards a single nucleotide in several polymorphisms); if sequence is considered not plausible, re-type If inconsistencies occur, re-type these specimens. From the entirety of unambiguously genotyped specimens, produce reference data set for which consistency the laboratory/researcher of origin holds primary responsibility, even though data are shared or submitted to central data bases. If microsatellite data from different laboratories are to be jointly analysed, type a set of reference samples in both labs in order to synchronise allele calling (binning).

IV. **Central databases hold responsibility for combined data sets**. In coordinated data acquisition efforts (e.g. as in BCB-bowhead whales), there should be a stringent time schedule for quality checks on composite data sets, implemented by two types of deadlines. The first deadline is for data submission. After that, a predefined period of quality control starts in which (1) the individual laboratory can still correct the submission and (2) the central database also performs plausibility checks on data consistency (along the lines mentioned under (V)). If inconsistencies occur, they will be communicated to the laboratory of origin. If no consensus can be reached, this ambiguity will be reported in all occasions where the data are used. After the quality control period, data **must not** be changed, except for very specific reasons for which the laboratory of origin holds full responsibility.

V. **Data analysis**. Manual file conversion should be avoided (because of copying error). Use automated routines for file conversion whenever possible.

In addition to these guidelines, error rates should be systematically estimated. Incorporate replicated blind controls that can be used to compare genotypes generated throughout the data generation process. These controls serve several purposes as follows:

(1) Random sample replication to identify random and systematic errors. A subset of samples (a few percent of the total) scattered throughout the samples and genotyped/sequenced at all loci will help to identify errors that have to do with both sample handling and raw data interpretation.

(2) Control samples (2-3) replicated in every genotyping experiment (PCR and electrophoresis) serve to verify alleles and normalise sizes across time, laboratories and technologies.

(3) Targeted replication of samples after the majority of data are generated will allow verification of data quality and can also detect sample handling errors (e.g. reversal of a sample plate). This should involve some samples from every sample group

run together, and result in ≥10% replication of the data set.

Although it is not practical to detect and correct every error by the measures suggested above, some errors have potentially greater impact on analysis than others. One example of this is the presence of erroneous homozygous genotypes at rare alleles. Presence of a single rare homozygous genotype in a stratum has been shown to cause significant deviations from Hardy-Weinberg equilibrium, resulting in false inference of population structure (Morin *et al.*, 2007). Jackknife analysis of genotypic data (repeated analysis with the removal of one sample at a time) can reveal which samples have the greatest effect on HWE, so that they can be re-checked to verify the genotypes (Morin *et al.*, 2007; Morin and McCarthy, 2007)

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2.7 Template for DNA registries

The Scientific Committee produced these two templates for DNA registers.[MORE EXPLANATION HERE? - DONOVAN]

Footnote no.	1	2	3	4	5	6	7	8	9	10	11	12
Species/year	Type	No. whales	No. duplicates	No. missing	No. lab problem	No. mtDNA	% mtDNA	No. msat	% msat	Sex analysed	% sexed	Notes
Species X												
Prev. years*												
2011												
Prev. years*												
2011												
Prev. years*												
2011												
Species Y												
Prev. years*												
2011												
Prev. years*												
2011												

Prev. years*												
2011												
Species Z												
Prev. years*												
2011												
Prev. years*												
2011												
Prev. years*												
2011												

Prev. years* accumulative number from the past register records.
[1]Key to sample types: SP=special permit catch; C=commercial catch; BC=bycatch; ST=stranding. [2]Number of whales that potentially entered (prev. years) and enters (new year) the markets. [3]Number of occurrences (tissues) sample switching on board the vessels as detected by comparison of genetic profiles. [4]Number of individuals for which tissue samples are missing for other reasons than sample switching. [5]Genetic laboratory not able to obtain microsatellite profiles from tissue samples. [6]Number of samples analysed for mitochondrial control region. [7]% of total samples analysed for mitochondrial control region. [8]Number of samples analysed for microsatellites. [9]% of total samples analysed for microsatellites. [10]Number of samples analysed for sex. [11]% of total samples analysed for sex. [12]Other problems or information.

footnote #	1	2	3	4	5	6	7	8	9	10	11	12
Species/Year	type	# whales	# duplicates	# missing	# lab problem	#mtDNA	%mtDNA	#msat	%msat	sex analyzed	% sexed	note
Species X												
prev. years*												
2011												
prev. years*												
2011												
prev. years*												
2011												
Species Y												
prev. years*												
2011												
prev. years*												
2011												
prev. years*												
2011												
Species Z												
prev. years*												
2011												
prev. years*												
2011												
prev. years*												
2011												

prev. years* accumulative number from the past register records
1 key to sample types: SP=special permit catch, C=commercial catch, BC=bycatch, ST=stranding.
2 number of whales that potentially entered (prev. years) and enters (new year) the markets
3 number of occurrences (tissues) sample switching on board the vessels as detected by comparison of genetic profiles.
4 number of individuals for which tissue samples are missing for other reasons than sample switching.
5 genetic laboratory not able to obtain microsatellite profiles from tissue samples.
6 number of samples analyzed for mitochondrial control region
7 % of total samples analyzed for mitochondrial control region
8 number of samples analyzed for microsatellites
9 % of total samples analyzed for microsatellites
10 number of samples analyzed for sex
11 % of total samples analyzed for sex
12 other problems or information

CHAPTER 3

GUIDELINES FOR DATA SHARING AND ARCHIVING

[CURRENTLY UNDER REVISION: **SUYDAM**]

3.1 Rules for Data Availability in the Scientific Committee

The issue of data availability is a complex and sensitive one. A balance must be struck between the needs of the Scientific Committee and the rights of the scientists who have invested considerable time and effort in collecting the data, particularly in the context of the RMP process. IWC The Data Availability Guidelines were discussed in 2003 (IWC 2004; JCRM 6 (suppl.):406-408), approved in 2004 (JCRM 6 (suppl.):57).

In 2003 the Scientific Committee agreed that the following three principles must be taken into account if a fair data availability solution was to be found, even if there are differences of opinion as to their relative importance:

1) Data represent a significant temporal and financial investment by scientists and research institutes – use of their data by others should be accompanied by appropriate safeguards.
2) The right of first publication is a generally accepted scientific norm.
3) If important management decisions are to be made, they should be based on a full scientific review of both data quality and analysis that can be independently verified.

The only remaining issue is whether the data are held by the Secretariat or by the data owner. Most members favoured the former but agreed that the most important issue was that once an application is approved, the data are sent promptly to the successful applicant(s) – i.e. normally within two weeks (see Procedure A (2) below).

Issues of data availability affect different categories of the Committee's work. What follows concerns data that the Scientific Committee believes is particularly important to its work. Requests of a more academic or general scientific nature should be dealt with on a bilateral basis.

Procedure A is the process for obtaining access to data for analyses that are needed to provide the best management advice on catch limits (e.g. the RMP and AWMP).

Procedure B is the process for obtaining access to data for analyses the Committee believes would be valuable in providing other advice to the Commission[25].

Note that the data themselves may in some cases be the same for both Procedure A and B. The difference lies in the objectives of the analyses. For Procedure A, it is essential that any requests for data are accompanied by a statement of the objectives of the study and the methods likely to be used (different timelines apply for novel methods rather than standard methods). Any application for data under Procedure A restricts use of the data to producing papers for the Scientific Committee that are directly relevant to providing management advice on catch limits.

Use of the word 'meeting' below includes Annual Meetings, Special Meetings and intersessional workshops. Applications can only be made by accredited persons in accordance with the Committee's Rules of Procedure.

3.1.1. Data Availability Group

The Scientific Committee shall be represented by a small group comprising the Chair, the Vice-Chair and the Head of Science, hereafter called the Data Availability Group.

3.1.2 Conditions for data recipients

Applications deemed suitable under Procedure A or Procedure B below are granted under the following conditions:

1) Data shall not be transmitted to third parties.
2) Papers may only be submitted to a Committee meeting in accordance with the time restrictions given below. Such papers must not include the raw data or the data in a form in more detail than is necessary to understand the analysis.
3) Papers must carry a restriction on citation except in the context of lWC meetings.
4) Data owners are offered co-authorship.
5) Publication rights remain strictly with the data owner.
6) Data shall be returned, to the Secretariat or the data owner as appropriate, immediately after the meeting at which the paper is submitted and any copies destroyed, unless an extension is granted.
7) Data requesters sign a form agreeing to the above conditions. Such forms will be held by the data owner and the Secretariat.
8) ln the event of a breach of the conditions in (6), serious sanctions [to be determined] will apply.

3.1.3 Procedure A

The following shall apply with respect to data required for the process outlined in Table 2.1.1 (chapter 2, section 2.1) for the RMP,

[25] For example, the request for data for VPA analyses considered last year.

the AWMP (see section 2.3) and other information used to provide advice on aboriginal subsistence catch limits before the relevant SLAs have been completed. The rules apply to all data owners who wish their analyses to be considered as part of the process to provide advice on catch limits.

Data owners may submit data to be treated under this procedure, even if they do not intend to analyse the data themselves.

When an application for data under this procedure is submitted, the Data Availability Group shall (a) decide whether an application fulfils the criteria with respect to the objectives of the study and (b) determine whether the methods proposed are considered standard or novel. The small group may take advice from the data owner, applicant or other relevant scientists in this process.

1) lf they wish analyses to be considered by the Committee, data owners must make data used for the analysis available in an agreed form and specified resolution (if desired, to the Secretariat) no later than 6 months before the meeting at which they are to be used. Examples are given in Table 3.1.1 and section 3.1.3.1. These data shall be made available to accredited persons only under the conditions listed above. Data owners shall be notified of any such requests, including a description of the objectives of the study and the methods to be used.
2) The Secretariat or data owners shall respond (i.e. send the data) to requests for data approved by the small group promptly, normally within two weeks of receiving the request.
3) lf novel methods are to be used, Scientific Committee papers documenting data analysis and results shall be circulated no less than 3 months before the meeting at which they are to be considered. Any such papers should include sufficient documentation of the analysis for it to be fully reviewed and any associated analytical software shall be lodged with the Secretariat.
4) lf standard methods are used, Scientific Committee papers documenting data analysis and results shall be circulated no less than 2 months before the meeting at which they are to be used.
5) Alternative analyses carried out in response to papers submitted under (3) or (4) shall be circulated no less than 1 month before the meeting at which they are to be used.

Table 3.1.1 shows a hypothetical example of how Procedure A might function in practice.

Table 3.1.1.: A worked hypothetical example of how Procedure A functions

Years 0-2	Country A collects genetic samples from 200 animals.
Nov. year 2	The data are almost all processed and the country's scientists decide that they wish an mtDNA analysis of their data to be considered by the Scientific Committee at its Annual Meeting beginning 1 June year 3. They consult with the small group and are informed that one of the analyses they propose is considered 'standard' and the other 'novel '.
Dec. year 2	The mtDNA data are submitted to the Secretariat at the resolution given in Appendix 1 (sequences by animal, date position, sex, length). They are now available to accredited persons following Procedure A. This is notified to the Committee by the Secretariat.
Jan. year 3	An accredited person (Murphy) sends in a brief standard form proposal explaining: (1) the objectives of his research; (2) the methods; (3) the data required; and (4) agreement to abide by the conditions for data use. This is reviewed by the small group, deemed acceptable and a copy of the proposal and the agreement is sent to the data owners. They and Murphy are informed that the proposed method is considered novel and the implications of this are explained. The data are sent to the applicant by the Secretariat within 2 weeks of notification.
Feb. year 3	Another accredited person (Gonzalez) sends in a brief standard form proposal explaining: (l) the objectives of her research; (2) the methods; (3) the data required; and (4) agreement to abide by the conditions for data use. This is reviewed by the small group, deemed acceptable and a copy of the proposal and the agreement is send to the data owners. They and Gonzalez are informed that the proposed method is considered standard and the implications of this are explained. The data are sent to the applicant by the Secretariat within 2 weeks of notification.
I Mar. year 3	Papers by both the data owner and Murphy using novel methods are submitted to the Committee. The data owners' paper also includes the results of the standard analysis.
I Apr. year 3	Gonzalez' paper is submitted to the Committee.
I May year 3	Papers by the data owner and Murphy are presented.
I Jun. year 3	The Scientific Committee meeting.

3.1.3.1 EXAMPLES OF DATA THAT COULD BE LODGED IN ACCORDANCE WITH PROCEDURE A

(1) If genetic analyses are tabled, then by animal one would expect:

   (a) date sampled;
   (b) position sampled;
   (c) nuclear DNA microsatellites;
   (d) mtDNA sequences;
   (e) length, sex.

(2) If movement data analyses are tabled, then by animal one would expect:

   (a) day of first marking;
   (b) position of first marking;
   (c) day/position of ‘recapture(s)’ (harvest, photo-id, telemetry);
   (d) known additional data (e.g. length, sex).

3.1.3.2 APPLICATION UNDER PROCEDURE A OF THE DATA ACCESS AGREEMENT

Applications made under Procedure A should be made to the contact persons identified in the summary files provided in section 3.1.5.

3.1.3.3 DEADLINES UNDER PROCEDURE A

Under Procedure A, there are deadlines for papers using those data to be submitted to the Scientific Committee (section 3.1.3). They are as follows:

Type of paper	Time before first day of SC Plenary
(a) Final datasets available	6 months
(b) Papers using novel methods	3 months
(c) Papers using standard methods	2 months
(d) Papers responding to those above ('b' and 'c')	1 month

3.1.4 Procedure B

This applies to data required for analyses deemed important in providing advice to the Committee other than catch limits (e.g. on the status of stocks not subject to whaling). For data not subject to Procedure A, the data owners shall produce, in collaboration with the Committee, a published protocol for data access that applies to requests generated by the Committee, to ensure clarity and a mutual understanding of the process.

1) The Committee shall specify the nature of the work and the data required during the meeting at which the recommendation is made, to the fullest extent possible in the time available at the meeting and in accord with the published protocol. lt should also name the appropriate scientists to undertake the work and designate an appropriate timeline.
2) Applications to the data owners following the published protocol referred to above, should be submitted by the Data Availability Group assisted by a nominated member of the relevant delegation or institute. The Data Availability Group will consult with relevant members of the Committee if further explanation or clarification is required.
3) lf the above process is followed, then the data owners will normally approve the applications within a specified time period in accordance with the published protocol.
4) Applications shall only be granted under conditions given above.

3.1.5 Data

A list of stocks with available datasets is given below. These are downloadable summary files of available data and a list of data held by the IWC Secretariat.

Western North Pacific common minke whales (2012)

Genetic data for the *Pre-Implementation Assessment* (Japan)[LINK]
Genetic data for the *Pre-Implementation Assessment* (USA)[LINK]
Genetic data for the *Pre-Implementation Assessment* (Korea)[LINK]
Sightings data for the *Pre-Implementation Assessment* (Japan)[LINK]
Sightings data for the *Pre-Implementation Assessment* (Korea)[LINK]

Western North Pacific common minke whales (2018)

Genetic data for the *Pre-Implementation Assessment* (Japan)[LINK]

Eastern North Pacific gray whales (2012)

Summary of data for the 2012 *Implementation Review*[LINK]

Bering-Chukchi-Beaufort Seas stock of bowhead whales (2012)

Summary of data for the 2012 *Implementation Review*[LINK]

Bering-Chukchi-Beaufort Seas stock of bowhead whales (2018)

Summary of data for the 2018 *Implementation Review*[LINK]

Applications for data held by the International Whaling Commission shall be copied to the Data Availability Group.

3.1.6 Protocols

At present, there are five agreed protocols for approaching the Institute of Cetacean Research (ICR), the Cetacean Research Center (CRC) and National Fisheries Research and Development Institute, the University of Auckland, the National Research Institute of Far Seas Fisheries (NRIFSF) and Fisheries Research Agency, and the Southern Ocean Research Partnership (SORP) for data available under Procedure B.

3.1.6.1 PROTOCOL FOR ACCESS TO SAMPLES/DATA FROM THE INSTITUTE OF CETACEAN RESEARCH (ICR)

3.1.6.1.1 Introduction

This protocol has been developed in the context of Procedure B of the IWC Scientific Committee's rules for data availability adopted at the 55th Annual Meeting (IWC 2004, pp. 56-57 and 406-408). Procedure B applies to data required for analyses deemed important in providing advice to the Committee other than catch limits. Conditions for data recipients (repeated below) as specified in the rules for data availability are applicable.

It was agreed that the Committee shall specify the nature of the work and the data required during the meeting at which the recommendation is made, to the fullest extent possible in the time available at the meeting and in accord with the published protocol. Requests to the ICR for data under Procedure B of the Scientific Committee's rules for data availability shall be submitted by the Data Availability Group assisted by a nominated member of ICR.

It was also agreed that if the correct process is followed, the data owners will normally approve the applications within a 'specified time period'; in this case ICR agrees that it will respond within 2 weeks of receiving an application.

3.1.6.1.2 Format of the application

The format for the application is based on the revised application for catch-at-age analyses agreed by all members of the Scientific Committee at the end of the Scientific Committee meeting in 2003 (IWC 2004, pp. 244-245).

(a) *Title* of the proposal, giving the broad subject of the proposed analyses.
(b) *Investigators:* the full name and affiliation of the principal investigator(s) and co-investigator(s) should be provided. This should include at least one scientist from ICR.
(c) *Objectives and rationale of the study* as specified by the by the Scientific Committee along with the appropriate reference to the report(s) of the Scientific Committee. This will include the reasons why the proposed analyses are important and how they fit into previous work.
(d) *Data to be used* will include a general description of all data to be used as well as data held by ICR. For the ICR-held data, the precise requirements will be given, including the level of disaggregation.
(e) *Description of the methods* likely to be used. The level of detail must be in accordance with the level of novelty of the proposed methods and the particular research questions they will address. References to similar analyses should be included where available.
(f) *Schedule of the work:* this should include estimated times for the various analyses to be carried out and an indication of which investigators will collaborate on individual components. If the project is a long-term project, annual progress reports will be required by ICR and the Scientific Committee.
(g) *Output of the research:* this will follow the rules for publication agreed at the Scientific Committee meeting and given below. ICR may consider requests for less stringent conditions (e.g. presentations at non-IWC scientific meetings, publications, etc.). Such requests should be detailed here.

3.1.6.1.3 Consideration of the proposal

If an application has been approved by the whole Scientific Committee at an annual meeting, it will normally be approved by ICR. However, the final decision will always remain the prerogative of ICR. ICR may request reviews by an internal review group and/or external experts. The following factors will be taken in to account by ICR when considering applications.

(a) *Priority:* highest priority for analysis/research of samples/data produced by Japan's Whale Research Programs under Special Permit, will be for the scientists that collected and obtained the data in any particular field.
(b) *Suitability of the requested data in the context of the proposed methods and the objectives of the research.*
(c) *Level of co-operation with ICR scientists.*

The response to an application for data will be communicated by the ICR's Director General to the Data Availability Group and may include requests for further information. If the research proposal is accepted, ICR will nominate a scientist, (normally one of the co-investigators) who shall be responsible for making the necessary arrangements to provide the required samples/data.

Agreed Scientific Committee conditions for data recipients

Applications deemed suitable under Procedure A or Procedure B below are granted under the following conditions:

(1) Data shall not be transmitted to third parties.
(2) Papers may only be submitted to a Committee meeting in accordance with the time restrictions given below. Such papers must not include the raw data or the data in a form in more detail than is necessary to understand the analysis.
(3) Papers must carry a restriction on citation except in the context of IWC meetings.
(4) Data owners are offered co-authorship.
(5) Publication rights remain strictly with the data owner.
(6) Data shall be returned, to the Secretariat or the data owner as appropriate, immediately after the meeting at which the paper is submitted and any copies destroyed, unless an extension is granted.
(7) Data requesters sign a form agreeing to the above conditions. Such forms will be held by the data owner and the Secretariat. In the case of Procedure B, the Data Availability Group will sign the agreement on the Committee's behalf and ensure that the conditions of any agreement are met by any individual scientists involved in the analysis.
(8) In the event of a breach of the conditions in (6), serious sanctions [to be determined] will apply.

3.1.6.2 PROTOCOL FOR ACCESS TO SAMPLES/DATA FROM THE CETACEAN RESEARCH CENTER (CRC), NATIONAL FISHERIES RESEARCH AND DEVELOPMENT INSTITUTE

3.1.6.2.1 Introduction

This protocol describes the process of access to samples/data that held by the Cetacean Research Center (CRC), National Fisheries Research and Development Institute, Korea for analysis deemed important in providing advice to the Scientific Committee other than catch limits and has been developed in the context of Procedure B of the IWC Scientific Committee's rules for data availability adopted at the 55th Annual Meeting (IWC 2004, pp. 56-57 and 406-408). Conditions for data recipients as specified in the rules for data availability are applicable.

3.1.6.2.2 Format of the application

The format for the application should include the following items:

(a) *Title* of the proposal, giving the broad subject of the proposed analyses.
(b) *Investigators:* the full name and affiliation of the principal investigator(s) and co-investigator(s) should be provided. This should include at least one scientist from CRC.
(c) *Objectives and rationale of the study* as specified by the Scientific Committee along with the appropriate reference to the report(s) of the Scientific Committee. This will include the reasons why the proposed analyses are important and how they fit into previous work.
(d) *Data to be used* will include a general description of all data to be used as well as data held by CRC. For the CRC-held data, the precise requirements will be given, including the level of disaggregation.
(e) *Description of the methods* likely to be used. The level of detail must be in accordance with the level of novelty of the proposed methods and the particular research questions they will address. References to similar analyses should be included where available.
(f) *Schedule of the work:* this should include estimated times for the various analyses to be carried out and an indication of which investigators will collaborate on individual components. If the project is a long-term project, CRC and the Scientific Committee will require annual progress report
(g) *Output of the research:* this will follow the rules for publication agreed at the Scientific Committee meeting and given below. CRC may consider requests for less stringent conditions (e.g. presentations at non-IWC scientific meetings, publications, etc.). Such requests should be detailed here.

3.1.6.2.3 Consideration of the application

If an application has been approved by the whole Scientific Committee at an annual meeting, it will normally be approved by CRC. However, the final decision will always remain the prerogative of CRC. CRC may request reviews by an internal review group and/or external experts. The following factors will be taken in to account by CRC when considering applications.

(a) *Priority:* highest priority for analysis/research of samples/data produced by CRC, will be for the scientists that collected and obtained the data in any particular field.
(b) Suitability of the requested data in the context of the proposed methods and the objectives of the research.
(c) Level of co-operation with CRC scientists.

The response to an application for data will be communicated by the Director of CRC to the Data Availability Group and may include requests for further information. If the research proposal is accepted, CRC will nominate a scientist, (normally one of the co-investigators) who shall be responsible for making the necessary arrangements to provide the required samples/data.

Agreed Scientific Committee conditions for data recipients

Applications deemed suitable under Procedure A or Procedure B below are granted under the following conditions:

(9) Data shall not be transmitted to third parties.
(10) Papers may only be submitted to a Committee meeting in accordance with the time restrictions given below. Such papers must not include the raw data or the data in a form in more detail than is necessary to understand the analysis.
(11) Papers must carry a restriction on citation except in the context of IWC meetings.
(12) Data owners are offered co-authorship.
(13) Publication rights remain strictly with the data owner.
(14) Data shall be returned, to the Secretariat or the data owner as appropriate, immediately after the meeting at which the paper is submitted and any copies destroyed, unless an extension is granted.
(15) Data requesters sign a form agreeing to the above conditions. Such forms will be held by the data owner and the Secretariat. In the case of Procedure B, the Data Availability Group will sign the agreement on the Committee's behalf and ensure that the conditions of any agreement are met by any individual scientists involved in the analysis.
(16) In the event of a breach of the conditions in (6), serious sanctions [to be determined] will apply.

3.1.6.3 PROTOCOL FOR ACCESS TO DATA FROM THE UNIVERSITY OF AUCKLAND UNDER PROCEDURE B FOR THE IN-DEPTH ASSESSMENT OF WESTERN NORTH PACIFIC COMMON MINKE WHALES

3.1.6.3.1 Introduction

This protocol describes the process of accessing genetic data held by CS Baker at the University of Auckland, New Zealand, that the Scientific Committee believes would be valuable in the In-Depth Assessment of the Western North Pacific Common Minke Whales. This protocol has been developed in the context of Procedure B of the IWC Scientific Committee's rules for data availability, adopted at the 55th Annual Meeting (JCRM 6 (suppl.):57). Applications can be made only by accredited persons (in accordance with the Committee's Rules of Procedure).

3.1.6.3.1 Format of the proposal

A brief standard form proposal should comprise:

(1) the objectives of the research;
(2) the methods;
(3) the data required; and
(4) an agreement to abide by both the General and Specific conditions for data use (shown below).

3.1.6.3.2 General conditions for data recipients

All applications for Data Use are granted under the following conditions:

(1) Data shall not be transmitted to third parties.
(2) Papers may only be submitted to a Committee meeting in accordance with the time restrictions given below. Such papers must not include the raw data or the data in a form in more detail than is necessary to understand the analysis.
(3) Papers must carry a restriction on citation except in the context of IWC meetings.
(4) Data owners are offered co-authorship.
(5) Publication rights remain strictly with the data owner.
(6) Data shall be returned, to the Secretariat or the data owner as appropriate, immediately after the meeting at which the paper is submitted and any copies destroyed, unless an extension is granted.
(7) Data requesters sign a form agreeing to the above conditions. Such forms will be held by the data owner and the Secretariat. In the case of Procedure B, the Data Availability Group will sign the agreement on the Committee's behalf and ensure that the conditions of any agreement are met by any individual scientists involved in the analysis.
(8) In the event of a breach of the conditions in (6), serious sanctions [to be determined] will apply.

3.1.6.3.3 Specific conditions of the application (University of Auckland)

(1) All applications will be addressed to the Data Availability Group, which, in consultation with CS Baker (as Data Owner), will decide if the application meets the criteria that the objectives and analyses will provide valuable advice for the In-Depth Assessment (other than catch limits) to the IWC.
(2) The Data User must forward a draft paper documenting the data analyses and results to CS Baker (as Data Owner) with a copy to the Secretariat, one month prior to the meeting of the Scientific Committee (or any intersessional meetings or workshops in which the data are to be used), and agree to provide the Data Owner with the following options in regard to the final report to the Committee:
    (i) Review the analysis in the interest of accuracy, with the intent to resolve any substantial errors that might have arisen in data coding by the Data Owner, or transfer or formatting by the Data User.
    (ii) Collaborate with the Data User as co-author, if the Data Owners feels they are able to extend the scope of the analyses and/or the conclusions of the draft paper.
    (iii) Prepare a rebuttal for consideration by the Scientific Committee, if the Data Owners do not agree with the analyses or conclusions reached by the Data User.

The Data Availability Group will ensure that the applicant(s) have signed the agreement to abide by the general and specific conditions for data use. The applicant will then be sent the data (in its submitted form) by the Secretariat (within two weeks). CS Baker, University of Auckland (as Data Owner) will be sent a copy of both the proposal and agreement.

3.1.6.4 PROTOCOL FOR ACCESS TO SAMPLES/DATA FROM THE NATIONAL RESEARCH INSTITUTE OF FAR SEAS FISHERIES (NRIFSF), FISHERIES RESEARCH AGENCY, JAPAN, FOR DATA AVAILABILITY

3.1.6.4.1 Introduction

Far Seas Fisheries Research Laboratory (the present NRIFSF) has presented the protocol for data availability for the Comprehensive Assessment of Cetaceans in the past, but it has become unsuitable for new rules for data availability adopted at the 55th IWC Scientific Committee (JCRM 6 (suppl.):57). This protocol has been reorganized from that of the Institute of Cetacean Research, Tokyo, applying to Procedure B. Conditions for data recipients as specified in the rules for data availability are applicable.

It was agreed that Procedure B applied to data for analysis deemed important in providing advice to the Committee other than catch limits. However, the position of the Government of Japan has not changed on the matter of small cetaceans stated every year at the opening of the Committee. That is, the activities of the Commission with the population management of whales should be limited to the matters concerning whales listed on the Nomenclature of the International Whaling Conference Final Act (1946). Therefore, this protocol applies to only sample/data of large cetaceans obtained through the research activities of NRIFSF.

It was also agreed that if the correct process is followed, the data owners will normally approve the applications within a 'specified time period'; in this case NRIFSF agrees that it will respond within seven weeks of receiving an application.

3.1.6.4.2 Format of the application

The format for the application should include the following items:

(a) *Title* of the proposal, giving the broad subject of the proposed analyses.
(b) *Investigators:* the full name and affiliation of the principal investigator(s) and co-investigator(s) should be provided. This should include at least one scientist from NRIFSF.
(c) *Objectives and rationale of the study* as specified by the Scientific Committee along with the appropriate reference to the report(s) of the Scientific Committee. This will include the reasons why the proposed analyses are important and how they fit into previous work.
(d) *Data to be used* will include a general description of all data to be used as well as data held by NRIFSF. For the NRIFSF-held data, the precise requirements will be given, including the level of disaggregation.
(e) *Description of the methods* likely to be used. The level of detail must be in accordance with the level of novelty of the proposed methods and the particular research questions they will address. References to similar analyses should be included where available.
(f) *Schedule of the work:* this should include estimated times for the various analyses to be carried out and an indication of which investigators will collaborate on individual components. If the project is a long-term project, annual progress reports will be required by NRIFSF and the Scientific Committee.
(g) *Output of the research:* this will follow the rules for publication agreed at the Scientific Committee meeting and given below. NRIFSF may consider requests for less stringent conditions (e.g. presentations at non-IWC scientific meetings, publications,

etc.). Such requests should be detailed here.

3.1.6.4.2 Consideration of the proposal

If an application has been approved by the whole Scientific Committee at an annual meeting, it will normally be approved by NRIFSF. However, the final decision will always remain the prerogative of NRIFSF.

3.1.6.5 SOUTHERN OCEAN RESEARCH PARTNERSHIP (SORP): DATA AVAILABILITY PROTOCOL

This protocol describes the process of accessing datasets held by members of the Southern Ocean Research Partnership (the Partnership). The Partnership is an international consortium for non-lethal whale research that aims to maximse the conservation outsomes for Southern Ocean whales through an understanding of the post-exploitation status, health, dynamics, and environmental linkages of their populations, and the threats they face. The Partnership ethos is that of open collaboration and communication.

This protocol has been developed in the context of Procedure B of the IWC Scientific Committee's rules for data availability, adopted at the 55th Annual Meeting of the International Whaling Commission (IWC 2004, pp. 406-408).

The Partnership retains the right to decline requests for access to datasets for analyses that form the basis of primary SORP project objectives already in progress by Partnership members or that form components of work in progress by students completing graduate qualifications.

3.1.6.5.1 Format of the proposal

A brief standard form proposal (dated) should include:

1. the full name and affiliation of the principal investigator(s) and co-investigator(s),
2. the objectives of the research and how these may contribute to the objectives of SORP projects,
3. the proposed methods and how these differ from, or contribute to, ongoing analyses of the Partnership members,
4. specifics of the data required and details of aggregation or disaggregation,
5. date by which the data are required and length of time for which the data are required,
6. a schedule for reporting,
7. a list of publications anticipated,
8. proposed authorship on publication(s);
9. a signed copy of this Data Availability Protocol, agreeing to the **General** and **Specific** conditions listed below.

3.1.6.5.2 General conditions for data recipients

All applications for data use are granted under the following conditions:

1. Data shall not be transmitted to third parties.
2. Data Owners are offered co-authorship.
3. Publication rights remain strictly with the Data Owner.
4. Data shall be returned, to the SORP Secretariat or the Data Owner as appropriate, immediately after it has been used for the agreed purpose and any copies destroyed, unless approval for further use is requested and granted.
5. Data requesters sign a form agreeing to the above conditions. Such forms will be held by the Data Owner and the SORP Secretariat.

3.1.6.5.3 Specific conditions of the application (Southern Ocean Research Partnership)

NB: The specific conditions below are provided as a guide only. Specific conditions with regard to acknowledgements, analyses, publications, authorship etc., will be further developed on a case by case basis between the Data Owner, the SORP Secretariat and the Data User.

1) All applications will be addressed to the SORP Secretariat, which, in consultation with the data owner, and the SORP Scientific Steering Committee, will decide if the application meets with the objectives and ethos of the Partnership.
2) The Data User will acknowledge the use of the SORP dataset by the following statement,

*Data provided by the Southern Ocean Research Partnership were all based upon non-lethal samples collected under a protocol approved by [*name the animal ethics committee*]. These data were provided by the Partnership for the purpose of collaborative investigation.*

3) Except where negotiated individually with the SORP Secretariat and the Data Administrator, the Data User will forward a draft paper documenting the data analyses and results to the Data Owner with a copy to the SORP Secretariat, one month prior to submission or presentation at any meetings/workshops/conferences in which the data are to be used.
4) Agree to provide the Data Owner with the following options in regards to the final dissemination of the data analyses and results:
   (i) Review the analysis, in the interest of accuracy, with the intent to resolve any substantial errors that might have arisen in data coding by the Data Owner or Data Administrator, or transfer or formatting by the Data User.
   (ii) Collaborate with the Data User as co-author, if the Data Owner or Administrator feels they are able to extend the scope of the analyses and/or the conclusions of the draft paper.
   (iii) Prepare a reply for consideration by the SORP Scientific Steering Committee, if the Data Owners do not agree with the analyses or conclusions reached by the Data User.
5) A member of the SORP Secretariat will indicate by signature of this protocol, that he or she will ensure that the applicant(s) have signed the agreement to abide by the general and specific conditions for data use. A signed copy of this agreement and attached proposal will be sent to the Data Owner and the SORP Secretariat, at which time the data will be transmitted to the Data User.

Dataset requested (brief description or file name) *Title of proposal (attach full proposal to this protocol and form)*

In regards to the dataset requested above, I, the Data User, agree to abide by the **General** and **Specific** conditions listed above:

Name of Data user			
Signature		Date	
Address			

Name of Data Owner			
Signature		Date	

Data Availability procedures and proforma for SORP data can be found here [LINK TO *"DataAvailabilityAgreement_SORP_FINAL"*].

3.1.6.6 SOUTHERN HEMISPHERE BLUE WHALE CATALOGUE TERMS OF REFERENCE AND SHARING AGREEMENT (SHBWC)

The Southern Hemisphere Blue Whale Catalogue Terms of Reference and Sharing Agreement (SHBWC) were finalized in 2016 (JCRM 18(supplement):438-439, 2017).

The Southern Hemisphere Blue Whale Catalogue (SHBWC) is an international collaborative effort to improve knowledge on Southern Hemisphere blue whales by comparing photo-identification catalogues among different researchers and institutions.

Any researcher or institution working on photo- identification of blue whales in the Southern Hemisphere is welcome to contribute to the SHBWC.

Once the user agrees to contribute photographs with the SHBWC, basic information regarding contact details and research area will be requested by the catalogue curator (Centro de Conservacion Cetacea). In addition, two agreements will need to be signed and dated:

(1) SHBWC sharing agreement and;
(2) IWC Data Availability Agreement under Procedure B (the process for obtaining access to data for analyses the Committee believes would be valuable in providing other advice to the Commission).

After procedures are accepted, researchers will receive a user ID and password. Before photo-identification submission, researchers belong to a restricted access user category and cannot see other contributed photo-identifications.

- Each photo-identification should be uploaded with associated location (e.g. latitude/longitude) and date information, with optional categories to associate additional information (e.g. genetic data). The location/date and other associated photo- identification information is only visible to regional catalogue managers.
- Photographs from each region (see 'Protocols and Procedures') should be uploaded into the geographic area corresponding to the source of the photo.
- Once photo-identifications have been uploaded, user access is upgraded so that it is possible to see photo-identifications contributed by other groups and suggest possible matches. No location or date information is disclosed on the photo-identification database.
- Your name and contact information will be released to those requesting further information.

When a match is found, catalogue owners will be contacted and informed of the finding. If approved by both parties, the information will be used for publication. For IWC assessment purposes, this information can also be disclosed in unpublished papers, co-authored by contributors, which contribute to the Committee work (IWC Data Availability Agreement).

By accepting to contribute and use the SHBWC, the user agrees to the following SHBWC sharing agreement:

1) photographs will only be used for the purposes of comparing blue whale identification catalogues;
2) all photographs and data are copyrighted to the contributing organisations and individuals, and may not be used or reproduced without permission;
3) any individual matches found as a result of comparing catalogues will be reported immediately to the contributor;
4) any announcements of a match or matches between catalogues, including publications of any sort, should include names

representing both/all catalogues as authors of the match;

5) data providers will communicate beforehand with each other and come to agreement to determine co- authorship of announcements or publications. After approval of use if obtained, any use of the photographs and matches should include acknowledgement of both the data provider and the SHBWC as appropriate;
6) prior written consent of the original data providers is required to use data contained in SHBWC in any publication, product, or commercial application (press releases, scientific or popular publications, web sites, funding or reporting documents, advertisements, etc.); and
7) users will not hold the SHBWC liable for errors in the data. While we have made every effort to ensure the quality of the database, we cannot guarantee the accuracy of the data.

In addition, the IWC Data Availability conditions for use of data is considered a fundamental part of this sharing agreement and includes the following rules and conditions:

1) data shall not be transmitted to third parties;
2) papers may only be submitted to a Committee meeting in accordance with the following time restrictions:
    - novel methods – three months before the Scientific Committee meeting;
    - standard methods - two months before the Scientific Committee meeting; and
    - alternative analyses submitted in response to earlier papers - one month before the Scientific Committee meeting.

Such papers must not include the raw data or the data in a form in more detail than is necessary to understand the analysis:

1) papers must carry a restriction on citation except in the context of IWC meetings;
2) data owners are offered co-authorship;
3) publication rights remain strictly with the data owner; and
4) data shall be returned to the data owner immediately after the meeting at which the paper is submitted and any copies destroyed, unless an extension is granted.

3.1.5 Agreement[ADDED FROM THE WEBSITE]

For the successful operation of the agreement, certain conditions must be met that ensure the rights of the data holders. An example of the standard Data Availability Agreement (DAA) letter, as the one below, can be found here [LINK TO "*DataAvailabilityAgreement*"]. This DAA must be signed by each Data requesters.

3.1.6 Report on data availability requests

The Data Availability Group reports annually to the Committee on all received requests for data access and their outcome.

3.1.7 Reference

International Whaling Commission. 2003. Report of the Scientific Committee. J. Cetacean Res. Manage. (Suppl.) 5:1-92.
[MISSING REFERENCES – TO FIX]

	International Whaling Commission: Data Availability Conditions for use of Data

NOTE: 1 FORM PER USER IF MORE THAN 1 PERSON

With respect to the data received from

Insert name of data provider and short description of data here

I agree to abide by the following rules and conditions:

(1) Data shall not be transmitted to third parties.
(2) Papers may only be submitted to a Committee meeting in accordance with the following time restrictions:

- Novel methods – 3 months before the Scientific Committee
- Standard methods - 2 months before
- Alternative analyses submitted in response to earlier papers - 1 month before

Such papers must not include the raw data or the data in a form in more detail than is necessary to understand the analysis.

(3) Papers must carry a restriction on citation except in the context of IWC meetings.
(4) Data owners are offered co-authorship.
(5) Publication rights remain strictly with the data owner.
(6) Data shall be returned, to the data owner immediately after the meeting at which the paper is submitted and any copies destroyed, unless an extension is granted.

Name			
Signature		Date	
Address			

3.2 Procedure to consider applications for the use of acoustic data, tissue samples or photo-identification photographs

3.2.1 Research Proposal: Request for use of: (1) IWC IDCR/SOWER; and/or (2) IWC-POWER samples/data

The Committee has procedures to consider applications for the use of acoustic data, tissue samples or photo-identification photographs collected in IWC research programmes (i.e. SOWER and POWER and other IWC datasets), outside the Data Availability system.

The user proposal form for SOWER and POWER data can be downloaded here.

The POWER Cruise Steering Group reviews (E-MAIL) these proposals.

3.3 IWC Guidelines for Photo-Identification Catalogues on data access and data sharing

The Committee finalised the IWC Guidelines for Photo-Identification Catalogues in 2017 (IWC 2018, pp. 408-412).

3.3.1 Background

The International Whaling Commission (IWC) has a history of using data and analyses from photo-identification catalogues to assist with its work. (Within this document the term 'photo-identification catalogue' describes a database that includes whale identification photographs with corresponding dates and geographic positions.) Photo-identification data have been used to identify patterns of movement, residency, habitat use, population structure and to estimate abundance and other population parameters (e.g. Bradford *et al.*, 2008; Calambokidis *et al.*, 2009; Carroll *et al.*, 2011; Koski *et al.*, 2010; Wedekin, *et al.*, 2010; Whitehead *et al.*, 2008; see also *Rep. int. Whal. Commn*., *Special Issue* 12, 1990).

Recognising the great value of such studies (e.g. IWC, 1990), the IWC has supported the development of photo- identification catalogues to facilitate assessment work (e.g. Southern Hemisphere humpback whales, Southern Hemisphere blue whales and Pacific gray whales). Such catalogues can also assist in providing information on entanglement, ship strikes and health status (e.g. Knowlton, *et al*., 2012).

The IWC has supported (financially or by submitting photographs from IWC cruises) what can broadly be considered two types of photo-identification catalogues:

(1) 'independent' catalogues that are pertinent to specific on-going assessments but for which maintenance and control belongs outside the IWC; and

(2) 'repository' catalogues that have IWC oversight.

Repository catalogues are supported for the general value of their data and potential use for assessment in the future whether or not they are currently being used by the IWC in an on-going assessment (e.g. the Antarctic Humpback Whale Catalogue). Catalogues can move from one status to another during the progress of assessments. In repository status, catalogue holders need only submit an annual report (see reporting, below). For an on-going assessment, the data requested may include full catalogues, re-sighting records, and possibly additional, associated data (behaviour, sex, age class, etc.). In this case, if an independent catalogue has received funding it would provide a summary report in addition to the contributed data.

3.3.1.1 CONSERVATION AND SCIENTIFIC BENEFITS OF SHARED CATALOGUES

Photo-identification catalogues are usually compiled from regional surveys in an area that typically represents only part of the range of the focal species. The effective study and management of whales at the population level benefits from a broad (full range if possible) spatial coverage. These are wide ranging animals that travel across regional and international boundaries and comprehensive research and management depends on the collaboration among researchers as well as governments. An important role for the IWC, in being able to provide the best scientific basis for conservation and management advice, is to encourage such collaboration to allow broad and robust assessments of cetaceans.

For example, to understand broad ecological patterns or undertake range-wide assessments, it is necessary to combine ('reconcile') catalogues amongst research groups. The comparison of photo-identification catalogues between regions can reveal whale movement patterns, migration routes, and determine breeding and feeding area linkages. Using photo- identification data from throughout a species or population's range allows for a greater understanding of population structure and provides data for a more comprehensive abundance estimate. Examples of outputs from some large ocean- wide catalogue reconciliations are given in Table 3.3.1.

3.3.1.2 DATA ACCESS FOR SHARED CATALOGUES

For population assessments where there is no reconciled IWC catalogue or for which the IWC has not developed a data availability agreement, the IWC uses analyses of data from multiple catalogues but the data themselves are not necessarily available to all Committee members (or even shared among the different contributors). However, any scientist (including catalogue holders of contributed data) may submit a request for data access to the data owner(s) through the IWC and its usual data availability process[26]. Such requests are facilitated if the request is submitted to the Scientific Committee for endorsement before being submitted to the data owners. Requests are handled on a case-by- case basis by the IWC Data Availability Group (Chair, Vice-chair and Head of Science) that works to facilitate an appropriate data sharing agreement although the ultimate decision remains with the data owner. Requests must include a proposal that specifies the intended analysis and how it benefits the Scientific Committee and/or adds to the scientific knowledge of the species in question.

Data sharing agreements are in place for established IWC collaborative catalogues, such as the Antarctic Humpback Whale Catalogue and the Southern Hemisphere Blue Whale Catalogue. Researchers studying populations that correspond to these species and geographic designations are encouraged to join these collaborative catalogues and make use of the reciprocal data sharing agreements.

All catalogues sponsored in whole or in part by the IWC **must** have a data availability agreement that facilitates access for Scientific Committee members. These agreements should ensure that proposals endorsed by the IWC Scientific Committee for its work will be granted with agreed safeguards with respect to publication rights; the protocols for data access will be published on the IWC website.

Table 3.3.1: Examples of results from ocean-wide photo-identification catalogue reconciliations.

Acevedo, J. *et al.* 2007. Migratory destinations of humpback whales from the Magellan Strait feeding ground, Southeast Pacific. *Marine Mammal Science*, 23(2), pp.453-463. Constantine, R. *et al.* 2012. Abundance of humpback whales in Oceania using photo-identification and microsatellite genotyping. *Mar Ecol Prog Ser* 453: 249-261. Garrigue, C. *et al.* 2011. Movement of individual humpback whales between wintering grounds of Oceania (South Pacific), 1999 to 2004. *J. Cetacean Res. Manage*, 3, pp.275-281. Mizroch, S. A. *et al.* 2004. Estimating the adult survival rate of Central North Pacific humpback whales. *Journal of Mammalogy* 85(5):963-972. Weller, D.W. *et al.* 2012. Movements of gray whales between the western and eastern North Pacific. *Endangered Species Research*, 18(3), pp.193-199.
Publications from YoNAH - North Atlantic humpback whales Smith, T. D., *et al.* 1999. An ocean-wide mark-recapture study of the North American humpback whale (*Megaptera novaeangliae*). *Marine Mammal Science* 15:1-32. Stevick, P. T. 2001. Errors in identification using natural markings: rates, sources, and effects on capture-recapture estimates of abundance. *Canadian Journal of Fisheries and Aquatic Sciences* 58: 1861-1970. Stevick, P. T., *et al.* 2003. North American humpback whale abundance and rate of increase four decades after protection from whaling. *Marine Ecology Progress Series* 258: 263-273. Stevick, P. T. *et al.* 2006. Population spatial structuring on the feeding grounds in North Atlantic humpback whales (*Megaptera novaeangliae*). *Journal of Zoology*, 270(2), 244-255.
Publications from SPLASH - North Pacific humpback whales Barlow, J. *et al.* 2011. Humpback whale abundance in the North Pacific estimated by photographic capture-recapture with bias correction from simulation studies. *Marine Mammal Science* 27(4): 793-818. Calambokidis, J. *et al.* 2008. SPLASH: Structure of populations, levels of abundance and status of humpback whales in the North Pacific. Final report for Contract AB133F-03-RP-00078. 57pp. Available from <http://www.cascadiaresearch.org/files/Projects/Archived_projects/SPLASH/SPLASH-contract-Report-May08.pdf> Straley, J. *et al.* 2009. Assessment of mark-recapture models to estimate the abundance of a humpback whale feeding aggregation in Southeast Alaska. *Journal of Biogeography* 36(3): 427-438.

3.3.2 Objectives of the guidelines

To date, the IWC collaborative catalogues have been developed on an *ad hoc* basis responding to specific needs. Whilst this has worked to a greater or lesser extent – we envision that IWC assistance to facilitate collaboration amongst research groups and the development of reconciled catalogues may increase (e.g. with gray whales in the western North Pacific). It is therefore important to develop guidelines for photo-identification catalogues either (a) being sponsored by the IWC or (b) contributing photo data/analyses of such data to the IWC for assessment purposes. The conditions for these two types may vary in some instances. The aim is that catalogues adhere to common standards (e.g. with respect to photograph subject and quality, data submission, maintenance and reporting) such that they provide data at a level sufficient to allow the IWC to meet its population assessment and conservation goals. The guidelines are general in scope and intended for use by all kinds of photo-identification projects of large whales. (This may be expanded to small cetaceans in due course.) They are not guidelines on field techniques, although appendices providing

[26] For more information, see the IWC Scientific Committee Data Availability protocol, Procedure B <https://IWC.int/data-availability>.

examples of good practice may be developed at a later stage. The guidelines should be regularly reviewed and updated (approximately every three years unless justification arises to do so more frequently).

For use in population assessments, photo-identification catalogues must be fully reconciled internally. Identification photographs should be submitted to the IWC (see discussion below) with at least date and location data.

3.3.3 Catalogue contributions for population assessment - protocols

3.3.3.1 PHOTO SUBJECTS FOR LARGE WHALES, BY SPECIES

Primary photo subjects commonly used in bold (varies by region).

- Blue whales – **left and right side with dorsal fin**, fluke if available
- Fin whales – **dorsal fin** and flank; **chevron and blaze** (requires 3-4 photos of each side)
- Sei whales – **dorsal fin, flank** (requires 2 photos of each side)
- Bryde's whales - **left and right side with dorsal fin**
- Minke whales and dwarf minke whales - **left and right side with dorsal fin**
- Humpback whales – **fluke**; left and right dorsal fin and/or flank if no fluke available
- Omura's whales – **left and right side with blaze, chevron, and dorsal** (requires 2-3 photos of each side)
- Gray whales - **left and right side with dorsal hump**; fluke
- Right whales – **callosity patterns**; **vertical view of head**, lateral left and right sides of head
- Bowhead whales – **vertical view, entire dorsum**
- Sperm whales – **fluke**

Fluke, dorsal side, and flank photos should be linked for individual whales whenever possible. Note: Prominent scars or other physical anomalies should be photographed wherever they appear on the body.

3.3.3.2 CATALOGUE ORGANISATION

The objective is to facilitate matching, either new photographs within an existing catalogue[27] and/or between catalogues[28]. There are several ways to achieve this, such as grouping photographs within a catalogue based on similar natural markings – colour or dorsal fin shape, for example – that facilitates the inter-matching process. New identification photos can then be compared first to similarly marked animals, speeding up the process to finding a match, if it exists[29]. See Gendron and Ugalde de la Cruz (2012), Agler *et al.* (1990), and Allen *et al.* (1994) as examples for blue whales, fin whales, and humpback whales, respectively. This can be an appropriate way to organise catalogues, whether the catalogue is in printed or electronic format. Note that data sets that are not organised in this recommended format are still of value and can be 'salvaged.'

3.3.3.3 INTERNAL CATALOGUE RECONCILIATION

The inter-matching of photographs can be conducted manually (by eye) or computer-assisted (generally custom software and often species specific). Using the manual method, photographs can be compared in printed format, electronic format or a combination of both formats. This step may vary by species, by catalogue size, and by the staffing and funding resources available to the catalogue. All methods are valid as long as a clean validated dataset is produced.

Matches must be **unequivocal**, based on good quality photographs, and exhibiting a minimum of three match points[30]. All inter-matches should be confirmed by a second matcher. For IWC catalogues, the IWC **must** conduct/oversee cross- matching exercises on catalogue subsets to confirm internal reconciliation (and estimate errors) at specified intervals.

3.3.3.4 IMAGE QUALITY CODING

The quality coding of photographs is undertaken by most catalogues to ensure (as much as possible) that there is an equal probability that matches will be recognized and to reduce the amount of bias highly distinctive or indistinctive individuals might otherwise produce. It is essential that such coding is used in IWC catalogues and that the method is documented. Typically catalogues use 3, 4, or 5 quality categories (excellent – poor) in their coding systems, based on features such as the angle and distance of the animal relative to the camera, lighting, and focus. See Friday *et al.* (2000) and Mizroch and Harkness (2003) for examples of quality coding. Catalogues that have already been coded need not change their system. For the IWC, photographs of upper quality only are to be submitted (i.e. top 2 of 3 codes; top 3 of 4; top 4 of 5). Details will be agreed upon for individual catalogues.

Note the important difference between quality and distinctiveness. Photo quality is based on the features of the photo (above) regardless of how well the whale in the photo is marked. The tendency is to code the photo of an indistinctive whale with few natural marks as a poor-quality photo; this bias must be avoided as must the reverse.

3.3.3.5 SUBMISSIONS TO THE IWC

Submission of photos and data varies by the type of catalogue in relation to the IWC (Table 3.3.2):

(1) *Independent catalogues for use in assessments; catalogue not held by IWC*
These catalogues are pertinent to specific on-going assessments but maintenance and control belongs outside the IWC.

(2) IWC partially funded catalogue, with IWC oversight
These are catalogues for which the IWC provides funding and has an agreed oversight role. It is important that these

[27] Reconciling a catalogue internally.
[28] Reconciling two or more catalogues.
[29] After this first comparison, a new photo should still be matched to entirety of catalogue.
[30] A match point is a unique physical feature recognizable in both photographs (e.g. a nick in the dorsal fin, a specific swirl or spot(s) in the pigmentation, a scar).

catalogues meet IWC standards with respect to use of data and analyses in assessments. With these catalogues, the Scientific Committee can request additional photographs or data should it need to for an assessment. These may be repository or independent catalogues.

(3) IWC fully funded catalogues

These are catalogues that are funded by the IWC (and held by, although not necessarily in, the Secretariat). For these catalogues, all photographs and available data are required to be held in the database. These will be repository catalogues.

3.3.3.6 ARCHIVING

Following accepted best practice, all catalogues should back-up and archive their photos and data in multiple places including long-term offsite storage (e.g. backed up on 2-3 hard drives as well as on an institutional or cloud server). IWC funded catalogues are obligated to do this and to include confirmation of archival storage in their report to the IWC (see below).

3.3.3.7 REPORTING

A report should be submitted to the IWC for every year of funding; in a few cases this is an annual report. Templates for such reports will be provided by the IWC (they may vary if an assessment is on-going, for example). Normally the report would include the geographic areas, years/seasons, and number of individuals compared to the existent catalogue, along with results of the comparisons yielding the number of matches, the number of newly identified individuals, and the subsequent total number of identified individuals in the catalogue. The report should also contain a detailed Methods section that describes how inter-matching and quality coding were conducted. Data archival locations should be listed and recent publications generated from catalogue data should be provided. It is suggested that established long- term catalogues include a periodic error estimation in their reporting. Information on validation and error checking should be included in the report.

For a report example, see a recent annual report from the Antarctic Humpback Whale Catalogue, Stevick *et al.* (2015). Reports are required from both assessment and repository catalogues.

N.B. TECHNICAL APPENDICES INCLUDING EXAMPLES OF GOOD PRACTICE MAY BE ATTACHED TO THESE GUIDELINES THAT WILL BE REGULARLY UPDATED

Table 3.3.2: Submission of photos and data to the IWC from three different kinds of catalogues.

'Independent' catalogues for use in assessments, not held by the IWC	IWC funded catalogues	
	Partially funded catalogue, with IWC oversight	Fully funded catalogue, held at IWC
Images Photo format in the highest jpg resolution available[1] (RAW is too large)[2] Best identification photo(s) per individual. Higher quality photographs only (to be agreed on a case by case basis). Associated data can be included in the metadata of images (but this is not required). **Associated data**[3] Data submitted as a flat file (i.e. in Excel) and in IWC-specified order (on a case by case basis; the IWC will inform research groups specifically). Include a record for every year (or season) that an individual is photographed (only one set of identification photo(s) is submitted)[4]	**Images** The highest resolution available (including RAW if available). Best identification photo(s) per individual, per region. Higher quality photographs only (to be agreed on a case by case basis). Associated data included to the extent possible. **Associated data**[3] Data submitted as a flat file (i.e. in Excel) and in IWC-specified order (on a case by case basis; the IWC will inform research groups specifically). All sightings will be documented (within and between years).	**Images** The highest resolution available (including RAW if available). Best identification photo(s) per individual per sighting. Higher quality photographs only (to be agreed on a case by case basis). Associated data included to the extent possible. **Associated data**[3] The data will be held by the IWC in an appropriate database format. All sightings will be documented (within and between years).

[1]Note that it is better to collect fewer photos of the highest resolution than more photos in a lower resolution. Low resolution photos are unusable for photo-ID.

[2]RAW format might be accepted for archive purposes if the IWC is the main holder of single range-wide catalogue. Otherwise it is expected that research groups will archive their original photos and submit highest resolution copies to the IWC.

[3]This will include some or all of the following (to be specified on a case by case basis and dependent on availability). **At a minimum: whale identification number; image file name; photo subject (e.g. left side); date** (A resource for data standards regarding dates is ISO 8601: https://www.iso.org/iso-8601-date-and-time-format.html)**; position expressed as lat/lon** (Researchers are encouraged, but not required, to use a GPS logger to embed GPS data directly into the photos' metadata. It is also possible to add location data to photos using easily available, inexpensive software. If only a rough location is known submit the approximate lat/lon but identify it as approximate). Additional data: behaviour; sex; mother or calf designation; biopsy sample number; satellite tag number; comments. Comment to be qualitative, e.g. info on association with another known individual, unusual behaviour, unusual scar.

[4]There may be assessments that wish to examine the fluidity of inter-seasonal residencies, in which case all records within a season would be requested.

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CHAPTER 4

PROCESS FOR THE REVIEW OF SPECIAL PERMIT PROPOSALS AND RESEARCH RESULTS (FORMER 'ANNEX P') *[Appendix 5]*

The text on the Process for the review of Special Permit proposals and research results - commonly known as 'Annex P' - was first agreed at in 2008 (IWC, 2009, JCRM 11: 398-401). It was then modified (a) in 2014 (2015, JCRM 16: 349-53) with respect to data access (JCRM 16: 82), (b) in 2015 (2016, JCRM 17: 409-14) in light of Resolution 2014-5[31], (c) in 2016 (2017, JCRM 18: 403-9) based on the experience and suggestions from two Expert Panel reviews (2017, JCRM 17: 507-54) and (d) in 2018 (2018, JCRM 18 in press) in light of Resolution 2016-2[32].

4.1 Submission of new proposals

New proposals should be submitted to the Chair of the Scientific Committee ***and the Secretariat*** at least **six months** prior to the Annual Scientific Committee Meeting (hereafter Annual Meeting) at which they are to be discussed. ***Commission Resolution 2016-2 requests Contracting Governments to submit proposals for new special permit programmes, at least six months before the Annual Meeting held in the same year as a Commission meeting.*** Proposers may request that the proposal remains confidential[33]. The proposal shall be structured in the manner given below. In order to ensure that any proposal provides information on each of the items needed for review by the Expert Panel, the Proponent will perform a self-assessment using the checklist provided in Appendix 4.1. A completed checklist will be attached to the proposal.

Structure of the proposal:

(1) Objectives of the study

The objectives should:

(a) be quantified to the extent possible;

(b) be arranged into two or three categories, if appropriate: 'Primary', 'Secondary' and 'Ancillary';

(c) include a statement for each primary proposal as to whether it requires lethal sampling, non-lethal methods or a combination of both; and

(d) include a brief statement of the value of at least each primary ***proposed*** objective in the context of the three following broad categories objectives:

(i) improve the conservation and management of whale stocks,

(ii) improve the conservation and management of other living marine resources or the ecosystem of which the whale stocks are an integral part; and/or,

(iii) test hypotheses not directly related to the management of living marine resources;

(e) include, in particular for d(i) and d(ii), at least for each primary objective, the contribution it makes to *inter alia*:

(i) past recommendations of the Scientific Committee;

(ii) completion of the Comprehensive Assessment or in-depth assessments in progress or expected to occur in the future;

(iii) the carrying out of *Implementations* or *Implementation Reviews* of the RMP or AWMP;

(iv) improved understanding of other priority issues as identified in the Scientific Committee Rules of Procedure (IWC, 2006, p.180); and

(v) recommendations of other intergovernmental organisations.

(2) Methods[34] to address objectives:

a) field methods, including:

i. species, number (and see (c) below), time-frame, area;

ii. sampling protocol for lethal aspects of the proposal; and

iii. an assessment of why non-lethal methods, methods associated with any ongoing commercial whaling, or analyses of past data have been considered to be insufficient;

b) laboratory methods;

c) analytical methods, including estimates of statistical power where appropriate; ~~and~~

[31] *https://iwc.int/resolutions*

[32] *Resolution 2016-2 was adopted by a simple majority vote, with objections by some Contracting Governments.*

[33] *The SC is required to review SPs (Schedule para 30) and thus confidential can only refer to not being publicly available, i.e. outside the Commission.*

[34] Where novel or non-standard methods are proposed, sufficient information must be given to allow these to be ~~properly examined~~ *reviewed by the Expert Panel.*

d) time frame with intermediary targets***; and***

e) information pertinent to the terms of reference of the Expert Panel to assist them in their review, including specification of the data[35] used in developing that information.

(3) Assessment of potential effects of catches on the stocks involved:

(a) a summary of what is known concerning stock structure in the area concerned;

(b) the estimated abundance of the species or stocks, including methods used and an assessment of uncertainty, with a note as to whether the estimates have previously been considered by the Scientific Committee; and

(c) provision of the results of a simulation study on the effects of the permit takes on the stock that takes into account uncertainty and projects: (1) for the expected life of the permit (i.e. *n* years); (2) for situations where the proposal is assumed to continue for: (a) a further *n* years; (b) a further 2*n* years; and (c) some longer period of years since the start of the proposal.

(4) A note on the provisions for co-operative research:

(a) field studies; and

(b) analytical studies.

(5) A list of the scientists the proposers intend to send to the intersessional review Workshop

4.2 The review process

Resolution 2016-2 'requests Contracting Governments to submit proposals for new special permit programmes, at least six months before the Annual Scientific Committee Meeting held in the same year as a Commission meeting'. The Committee notes that, if possible, earlier submission by the proponents (e.g. 9 months prior to a Scientific Committee meeting) would be welcomed since this would allow more time for Expert Panel or Committee members to request data and undertake analyses, where appropriate. Some possible general scenarios for the review process are shown in Table 4.1 (see also Tables 3 in Appendix 4 for full details) for new proposals and Table 4.2 (see also Tables 3 in Appendix 4.4 for full details) for periodic and final reviews.

Table 4.1: Possible scenarios for reviewing new proposals (Annual Meeting refers to the Annual Scientific Committee Meeting)

Options		Stage 1	Stage 2	Stage 3	Timeframe
Option 1	Proposal submitted prior to Annual Meeting held in Commission year	Submitted 6 or 9 months prior to Annual Meeting	Workshop held 100 days prior to the Annual Meeting	Review completed at Annual Meeting following workshop	6 or 9 months
Option 2	Proposal submitted prior to Annual Meeting held in Commission year	Submitted 9 months prior to Annual Meeting	Workshop held 140 days prior to the Annual Meeting	Review completed at Annual Meeting following workshop	9 months
Option 3	Proposal submitted prior to Annual Meeting held in non-Commission year	Submitted 6 or 9 months prior to Annual Meeting	Workshop held 100 days prior to the Annual Meeting	Review completed at Annual Meeting following workshop or prior to Commission	6 or 9 months/ 18 or 21 months
Option 4	Proposal submitted prior to Annual Meeting held in non-Commission year	Submitted 9 months prior to Annual Meeting	Workshop held 140 days prior to the Annual Meeting	Review completed at Annual Meeting following workshop or prior to Commission	9 months/ 21 months

4.2.1 Intersessional Expert Panel Workshop

The initial review of a new proposal, or periodic and final reviews, shall take place at a small Expert Panel Workshop with a limited but adequate number of invited experts (who may or may not be present members of the Scientific Committee). A limited number of scientists associated with the proposal should attend the Workshop in an advisory role, primarily to present the proposal and answer points of clarification. It is important that the composition of the Expert Panel (hereafter 'the Panel') is considered balanced and fair (see below). The choice of experts shall be made by the Chair, Vice-Chair and Head of Science in conjunction with a Standing Steering Group (SSG) established by the Chair at an Annual Meeting, with special emphasis on the field and analytical methods provided in the proposal and estimation of the effect of catches on the stocks(s). The SSG shall be selected by the Chair, Vice-Chair and Head of Science, such that it represents an appropriate range of experience and expertise within the Scientific Committee. ***The SSG has normally comprised the four most recent Scientific Committee Chairs[36].*** The selection process for the Panel shall occur in the manner described below. ~~A schedule of events for the review process is shown in Table 1.~~

#.2.1.1 CHOICE OF EXPERT PANEL

The Scientific Committee Chair, Vice-Chair and Head of Science will take into account the comments made in IWC (IWC, 2010; 2011; 2012), recognising that some of these issues reflected availability of selected Panel members. In particular, the goal is to

[35] *Any data used in these evaluations should be specified and made available for the review. Where such data arise from catches taken under prior special permits, the procedures described in section #.2.3.1 will apply.*

[36] *Chairs with a clear conflict of interest are excused from this duty.*

obtain a full, fair, independent, balanced and objective review and careful efforts will be made to avoid any inferences of potential ***or perceived*** conflicts of interest. Emphasis will be given to including outside experts (non-Scientific Committee members) but the precise balance will depend on the subject matter. The Panel membership will include experts in the relevant field and/or analytical methods used in the Permit activities which may include those that are not specialists in whales.

All members of the Panel shall sign a written agreement of confidentiality on the discussion and outcome of the review. The confidentiality agreement will terminate when the Report of the Expert Panel is received by the Scientific Committee and it becomes public (about 60 days after the workshop).

#.2.1.2 FORMAT AND OBSERVERS

Following discussions at IWC (2012), at the discretion of the Chair, Workshops will normally follow a format of two types of sessions: (1) open sessions where a limited number of scientists associated with the proposal present the proposal and answer questions; and (2) closed sessions where only the Panel members discuss the proposal and develop the report. There may be a final closing session for the Panel to ask further questions of clarification. For these reasons, Workshops will be held at a venue convenient for proponents.

Scientific Committee members are allowed to attend the same sessions, as the proponents, as observers (they will be referred to as observers from here on). These observers will not normally participate in discussions unless invited to do so by the Chair under special circumstances[37] (*cf* the rule for observers to the Committee's meeting). ***Whenever possible, restricted live streaming of the open sessions will be set up as to allow remote participation by approved observers.*** All observers***, including remote participants,*** shall sign a written agreement of confidentiality on the discussion and outcome of the review. The confidentiality agreement will terminate when the Report of the Expert Panel is received by the Scientific Committee and it becomes public (about 60 days after the workshop).

In addition, any Scientific Committee member may submit reviews or analyses relevant to the review for consideration of the Panel following the agreed time frame outlined in Tables ***4.~~1~~3*** and *4.~~2~~4* ***in Appendix 4.4***.

The admittance of observers has logistical implications for the hosting of the Workshop. The importance of hosting the Workshop in a venue convenient for the proponents is important given the alternating open and closed sessions. Deadlines for registering interest in attendance are given in Tables ***4.~~1~~3*** and ***~~2~~4*** ***in Appendix 4.4***.

4.2.2 Procedure for review of new proposals

A tentative timetable for the review of a new Special Permit proposal is given in Tables 4.3 and Table 4.4 in Appendix 4.4.

The Chair shall circulate the proposal to the Vice-Chair, Head of Science and SSG, normally within **1 week** of receipt.

~~(1)~~ The SSG shall examine the proposal and in particular the field and analytical methods and, normally within **2 weeks**, suggest names for consideration for the Panel (if these experts are not members of the Committee they shall include a rationale for their choice) and the suggestions will be available to all SSG members.

~~(2)~~ The Chair, Vice-Chair and Head of Science will develop a proposed final list (with reserves) for consideration by the SSG within **2 weeks** and begin the process of establishing the time and venue of the Workshop taking into account the availability of the proposed experts and the scientists associated with the proposal.

~~(3)~~ The SSG will send final comments within **1 week**.

~~(4)~~ The Chair, Vice-Chair and Head of Science will agree a final list (with reserves); the proposal (with a note concerning any restrictions) will be sent to the selected experts and reserves - the process thus far will have taken about six weeks ~~since~~ ***once*** the proposal has been received.

The Workshop will take place at least **100 days** before the Annual Meeting. In addition to the selected experts it will include at least one of the Chair, Vice-Chair and Head of Science, one of whom shall chair the Workshop.

4.2.2.1 TERMS OF REFERENCE OF THE EXPERT PANEL WORKSHOP FOR THE SCIENTIFIC REVIEW OF NEW PROPOSALS ~~[complete section modified at SC/66a]~~

The primary objective of ~~the Scientific Committee and~~ the Expert Panel Workshop ***(and later the Scientific Committee)*** will be to review the proposal in the light of the stated objectives following the checklist provided in Appendix ***#.***1. Recall, the three broad categories of objectives are: (1) improve the conservation and management of whale stocks; (2) improve the conservation and management of other living marine resources or the ecosystem of which the whale stocks are an integral part; and (3) test hypotheses not directly related to the management of living marine resources. In particular, the review shall:

(1) comment briefly on the perceived importance of the stated primary objectives from a scientific perspective and for the purposes of conservation and management, noting particularly the relevance of each to the work of the Scientific Committee[38];

[37]Note: this has been interpreted as allowing observers who submit papers with substantial analyses to be allowed to present them in a similar manner to proponents who present papers e.g. through a short PowerPoint presentation (*cf* the 2014 JARPA II review).
[38]Include whether the programme objectives are sufficiently defined to enable an evaluation of the likely contribution of the different data sets to objectives.

(2) evaluate whether the objectives of the research could be achieved by non-lethal methods or whether there are reasonably equivalent objectives that could be achieved non-lethally[39];

(3) for broad categories of objectives 1 and 2, evaluate whether the elements of the research that rely on lethally obtained data are likely to lead to improvements in the conservation and management of whales. This evaluation should include whether the proposal demonstrates the likely magnitude and relevance of improvements to conservation and management arising from the achievement of the programme objectives;

(4) evaluate whether the design and implementation of the programme are reasonable in relation to achieving the programme's stated research objectives[40], and in particular, evaluate whether sample sizes and the spatial and temporal scales[41] are reasonable in relation to the programme's stated research objectives and whether non-lethal alternatives are not feasible to either replace or reduce the size of the lethal sampling being proposed;

(5) assess the degree to which the programme coordinates its activities with related research projects[42];

(6) provide advice on the likely effects of the catches on the stock or stocks involved under various scenarios of length of the programme. This will include *inter alia* examination of abundance estimates provided and may involve a different analysis to that provided in the original proposal, including assumptions that short permit proposals may be projected further into the future;

(7) determine whether the programme has specified intermediate targets that would allow for an adequate review of progress relative to programme objectives; and

(8) consider any other ~~relevant~~ matters ~~as decided~~ ***deemed relevant*** by the Scientific Committee.

The Panel may develop priority recommendations and optional recommendations or suggestions. In its report, the Panel will clarify which are 'priority recommendations' and which are 'optional recommendations' or suggestions, and for each recommendation will include the order of priority of the task, identify who is expected to take action (e.g. proponents, Scientific Committee), and propose a timeline for completion.

4.2.3 Procedure for periodic and final reviews

Commission Resolution 2016-2 requests Contracting Governments to submit review documentation for ongoing and completed special permit programmes, at least six months before the Annual Meeting held in the same year as a Commission meeting. For ongoing research without a defined final year, a periodic review shall take place in accordance with either the advice provided under Item (5) of the Workshop to review new proposals or on the advice of a periodical (normally around six years) review Workshop and taking into account the availability of the proponents. The final review shall normally take place no later than three years after the final take under Special Permits. The periodic and final reviews shall be based on documents provided by the proposers and other members of the Scientific Committee **six months** before the Annual Meeting at which the Workshop report is to be presented. In order to ensure that any periodic/final report provides information on each of the items needed for review by the Expert Panel, the Proponent will perform a self-assessment using the appropriate checklist ***(Appendix 4.2). Guidelines for the outline of final reports are contained in Appendix 4.3***. A completed checklist will be attached to the report. Information on the analytical methods likely to be used in documents presented to the Workshop that might assist with the selection of appropriate experts shall be circulated **nine months** before the Annual Meeting.

A tentative timetable for periodic or final reviews is given in Table 4.2.

The Chair shall circulate the information on the analytical methods to the Vice-Chair, Head of Science and SSG, normally within **1 week** of receipt.

~~(1)~~ The SSG shall examine the information available on the field and analytical methods and, normally within **2 weeks**, suggest names for consideration for the Expert Panel Workshop (if these experts are not members of the Committee they shall include a rationale for their choice) and the suggestions will be available to all SSG members.

~~(2)~~ The Chair, Vice-Chair and Head of Science will develop a proposed final list (with reserves) for consideration by the SSG within **2 weeks** and begin the process of establishing the time and venue of the Workshop taking into account the availability of the proposed experts and experts associated with the proposal.

~~(3)~~ The SSG will send final comments within **1 week**.

~~(4)~~ The Chair, Vice-Chair and Head of Science will agree a final list (with reserves); the proposal (with a note concerning any restrictions) will be sent to the selected experts and reserves - the process thus far will have taken about 6 weeks since the information on analytical methods has been received.

[39]The comparison of lethal and non-lethal means should be based on their potential to meet the programme objectives (or their reasonable equivalents) based on power analyses and feasibility, including effort and time frames required to produce comparable results.
[40]For broad categories of objectives 1 and 2, and with respect to methods and sample size, 'reasonable' is determined by a demonstration that methods and sample sizes are necessary and sufficient.
[41]With respect to spatial and temporal scales, assess whether the timeframe, as well as the seasonal and spatial distribution of lethal or non-lethal sampling are appropriate.
[42]This will include assessment of whether the degree of coordination is sufficient to ensure that the field and analytical methods are appropriate and best practice to achieve the stated objectives and whether the degree of coordination is sufficient to avoid unnecessary duplication.

~~(5)~~ The full ***set of*** documents ***(e.g., proposal, background information, etc.)*** shall be ~~circulated~~ ***made available to the Scientific Committee by the Secretariat*** no later than 6 months before the Annual Meeting.

~~(6)~~ Responses to those documents shall be submitted no later than one month before the Workshop.

The Workshop will take place at least **100 days** before the Annual Meeting. In addition to the selected experts it will include at least one of the Chair, Vice-Chair and Head of Science, one of whom shall chair the Workshop.

Table 4.2: Possible scenarios for periodic and final reviews (Annual Meeting refers to the Annual Scientific Committee Meeting)

Options		Stage 1	Stage 2	Stage 3	Timeframe
Option 1	Review scheduled for Annual Meeting held in Commission year	Submitted 6 or 9 months prior to Annual Meeting	Workshop held 100 days prior to the Annual Meeting	Review completed at Annual Meeting following workshop	6 or 9 months
Option 2	Review scheduled for Annual Meeting held in Commission year	Submitted 9 months prior to Annual Meeting	Workshop held 140 days prior to the Annual Meeting	Review completed at Annual Meeting following workshop	9 months
Option 3	Review scheduled for Annual Meeting held in non-Commission year	Submitted 6 or 9 months prior to Annual Meeting	Workshop held 100 days prior to the Annual Meeting	Review completed at Annual Meeting following workshop or prior to Commission	6 or 9 months/ 18 or 21 months
Option 4	Review scheduled for Annual Meeting held in non-Commission year	Submitted 9 months prior to Annual Meeting	Workshop held 140 days prior to the Annual Meeting	Review completed at Annual Meeting following workshop or prior to Commission	9 months/ 21 months

4.2.3.1 AVAILABILITY OF DATA RELEVANT TO THE PERIODIC OR FINAL REVIEW

The ***Scientific Committee shall decide on*** ~~decision to~~ hold***ing*** periodic or final reviews ~~shall take place~~ two Annual Meetings prior to the ~~Specialist~~ ***Expert Panel*** Workshop. **Two months** before the Annual Meeting prior to the ~~Specialist~~ ***Expert Panel*** Workshop, the proponents of the programme shall submit a preliminary[43] data description document that explains the data that will be available for the Workshop. That document will:

(a) outline the data that will be available, including by broad data type (e.g. sighting data, catch data, biological data***, genetics data***): the years for which the data are available; the fields within the database (e.g. for sightings data: species, date, time, school size; visibility; perpendicular distance etc.); the sample sizes;

(b) provide references to data collection and validation protocols and any associated information ***or metadata*** needed to understand the datasets or to explain gaps or limitations;

(c) where available, provide references to documents and publications of previous analyses undertaken of data collected during the programme; and

(d) contact details of who should be approached if ~~scientists~~ ***Scientific Committee members*** have questions regarding the data before submitting formal applications for them.

Members of the Scientific Committee and participants in the Expert Panel Workshop who wish to submit papers to the specialist Workshop should submit applications to the data holders in the data holders' data access protocol format via the Data Availability Group (DAG[44]). In accordance with a trial agreement reached at the 2014 Annual Meeting (IWC, 2015a, p.82), such requests should normally be developed for submission as a document to the Scientific Committee **four weeks** before the Scientific Committee meeting[45]. This will allow other members of the Scientific Committee (including the data holders) to consider alternative analyses. The final data description document and the data themselves shall be available in electronic format **one month** after the close of the Annual Meeting. The timetable is displayed in Table ***#.~~1~~2***.

Applications for the access to data for the purpose of periodic or final review, should follow the recommended approach of Procedure B of the IWC SC Data Availability Agreement (IWC, 2004). In order to facilitate this process, requests submitted in advance (see above) will then be considered at the Scientific Committee Meeting. Initially, data requesters, data owners and the DAG will discuss the request early in the Meeting. This will provide opportunities for clarification and possible amendment of proposed studies. If there is disagreement over the acceptability of the request (e.g. whether analytical methods are appropriate and within the terms of reference of the Workshop), this will be referred by the DAG to the appropriate sub-committee or an *ad hoc* group. In the hopefully rare event that disagreement remain***s*** after the sub-group discussion, then the DAG will be authorised to take the final decision on

[43]By use of the word 'preliminary', it is recognised that some information (e.g. exact sample sizes) may not be available but the document will be broadly complete including approximate sample sizes.
[44]In order to enable the DAG to function if one or more members are unavailable, the usual membership of the DAG (Chair, vice-Chair and Head of Science) will be expanded to include the Chair of the Special Permit working group and the Chair(s) of the most relevant sub-group(s). Any decisions (which should be few) can be taken with a quorum of three.
[45]While Committee members can still submit requests to the DAG after the meeting in accordance with the timeframe in the Tables, they should be aware that the process may take a longer time and the request may not be accepted.

the request. Data forms and requests can then be signed/authorised at the meeting. Data owners will provide the data in a prompt manner (usually within two weeks of the data becoming formally available one month after the close of the Annual Meeting) in accordance with the agreed protocols[46]. ***The DAG will report annually back to the Scientific Committee on the outcome of all requests.***

4.2.3.2 TERMS OF REFERENCE OF THE EXPERT PANEL WORKSHOP FOR PERIODIC AND FINAL REVIEWS UNDER SPECIAL PERMITS ~~[complete section modified at SC/66a]~~

The primary objective of the Scientific Committee and the Expert Panel Workshop will be to review the scientific aspects of the research under Special Permits in the light of the stated objectives. In particular, the review shall:

(1) for continuing programmes, evaluate whether the design and implementation of the programme, including sample sizes, continue to be reasonable in relation to achieving the programme's stated research objectives[4,6];

(2) for continuing programmes, evaluate whether the temporal and spatial scale of lethal sampling continues to be reasonable in relation to the programme's stated research objectives[5,6,7], and non-lethal alternatives are not feasible[47] to either replace or reduce the scale of lethal sampling proposed:

  (i) compare sample sizes from the original research proposal and the achieved sample sizes, and assess the effect of any discrepancy on the ability to achieve the programme's stated research objectives.

  (ii) assess whether, in light of developments since the commencement of the programme, the objectives of the programme could be achieved by non-lethal means, or whether there are reasonably equivalent objectives that could be achieved non-lethally[5, 48, 49].

(3) assess the extent of the programme's scientific output, and whether this is appropriate in light of the stated research objectives and the time elapsed;

(4) assess the degree to which the programme coordinated or continues to coordinate its activities with related research projects[8, 13];

(5) evaluate other contributions to important research and information needs that were not part of the original set of objectives of the research program;

(6) in the case of continuing reviews, provide advice on:

  (i) whether the programme continues to have specified intermediate targets that would allow for adequate review of progress in relation to programme objectives.

  (ii) evaluate how well the initial, or revised, objectives of the research have been met to date, and for broad categories of objectives 1 and 2 ***(see section 4.2.2.1 first paragraph)***, include the extent ~~to which~~ ***of*** progress ~~has been~~ regarding improvements in the conservation and management of whales.

  (iii) practical and analytical methods, including for non-lethal methods, that can improve research findings relative to stated objectives.

  (iv) appropriate sample sizes to meet the stated objectives, especially if new methods are suggested under item (ii).

  (v) effects on stocks in light of new knowledge on status of stocks.

  (vi) when future review(s) should be convened.

(7) consider any other ~~relevant~~ matters ~~as decided~~ ***deemed relevant*** by the Scientific Committee; and

(8) for final reviews, evaluate how well the initial, or revised, objectives of the research have been met, and for broad categories of objectives 1 and 2, include the extent to which results have led to demonstrated improvements in the conservation and management of whales.

As for the review of new proposals, the Panel may develop priority recommendations and optional recommendations or suggestions. In its report, the Panel will clarify which are 'priority recommendations' and which are 'optional recommendations' or suggestions and for each recommendation will include the order of priority of the task, identify who is expected to take action (e.g. proponents, Scientific Committee), and propose a timeline for completion.

4.3 Reports of Workshops (applies to new proposals, periodic reviews and final reviews)

The Chair ***of the Panel*** is responsible for the level and nature of participation of the scientists involved in the proposal, which should be limited to: (1) providing information to the invited experts in addition to that contained in the proposal or research results; and (2) answering questions posed by the invited experts. The ~~specialist group~~***Panel*** should attempt to reach consensus on the individual issues referred to above, but where this is not possible, the rationale behind the disagreement should be clearly stated in the

[46]Collaborative studies are encouraged and have produced valuable results in the past but are not mandatory. For clarification, it is noted that the reference to offers of co-authorship within the DAA is not intended to allow the data owners to veto presentation of an analysis but rather to ensure that they are offered co-authorship which they may accept or decline. If data owners do not agree with analyses then they have time to respond with papers of their own given the DAA timeline.
[47]In this case, the interpretation of 'feasible' or 'related' will be left to the opinions of the reviewers.
[48]For broad categories of objectives 1 and 2, where 'reasonably equivalent' is defined as having similar likely benefits in terms of improvements to conservation and management of whales.
[49]Evaluate the merits of replacing lethal sampling with non-lethal sampling, considering developments in non-lethal sampling protocols since the onset of the research program.

Workshop report. The final report of the Workshop shall be completed at least 80 days prior to the Annual Meeting and will be made available to the proponents for comments in line with the timetables provided (Tables 3 and 4).

4.3.1 Circulation to the Scientific Committee

The original special permit proposal, *or* the original result documents from ongoing or completed special permit research, the report of the Expert Workshop, and any revised permit proposal (following the agreed protocol), ~~*or*~~ any revised results, ***or any comments*** from the Contracting Government shall be submitted to Scientific Committee members no later than **40 days** before the Annual Meeting. The revised proposal, *or* revised results, will also be submitted to the members of the ~~specialist group~~***Expert Panel*** and they will be invited to submit joint or individual comments on that revision to the Annual Meeting.

4.4 Discussion at the Scientific Committee

The Scientific Committee will provide its evaluation on proposals of Special Permits programmes to the Commission in years when the Commission meets (regardless of when the review commences). The report of the Expert Panel Workshop will be discussed but not amended by the Scientific Committee. The comments of the Scientific Committee will be included in the Scientific Committee report. The original proposal and any revised proposal, the Expert Panel Workshop report (and subsequent comments on any revised proposal), and the Scientific Committee report will then be submitted to the Commission and become publicly available in accordance with the Commission's Rules.

4.5 Chronology and reference documents

A chronology and reference documents of past or expected ***Special Permit E***xpert ***Panel*** ~~('annex p')~~ workshops to review new, ongoing or completed special permit programmes ***is given in Table 4.3***.

Table 4.31: Past or expected *Special Permit* Expert *Panel* ~~('Annex P')~~ Workshops to review new, ongoing or completed special permit programmes.

Subject	Status	References
JARPN II (~~ongoing programme~~ ***periodic review***)	Completed in 2009	IWC (2010a; 2010b)
Icelandic (final review)	Completed in 2012	IWC (2014a)
JARPA II (~~ongoing programme~~ ***final review***)	Completed in 2014	IWC (2015a; 2015b)
NEWREP-A ***(new proposal review)***	Completed in 2015	IWC (2016a)
JARPN II (~~ongoing programme~~ ***final review***)	Completed in 2016	IWC (2017)
NEWREP-NP (new proposal review)	***Completed in 2017***	***IWC (2018)***
NEWREP-A (periodic review)	***Expected in 2021***	***N/A***
NEWREP-NP (periodic review)	***Expected in 2023***	***N/A***
Reference documents		

***4.6* References**

International Whaling Commission. 2004. Report of the Scientific Committee. Annex T. Report of the data availability working group. *Journal of Cetacean Research and Management (Supplement)* 6:406-08.

International Whaling Commission. 2006. Rules of Procedure of the Scientific Committee. *Annual Report of the International Whaling Commission* 2005:180-83.

International Whaling Commission. 2010a. Report of the Expert Workshop to Review the Ongoing JARPN II Programme, 26-30 January 2009, Yokohama, Japan. *J. Cetacean Res. Manage. (Suppl.)* 11(2):405-50.

International Whaling Commission. 2010b. Report of the Scientific Committee. *J. Cetacean Res. Manage (Suppl.)* 11(2):1-98.

International Whaling Commission. 2011. Report of the Scientific Committee. *J. Cetacean Res. Manage. (Suppl.)* 12:1-75.

International Whaling Commission. 2012. Report of the Scientific Committee. *J. Cetacean Res. Manage. (Suppl.)* 13:1-74.

International Whaling Commission. 2014a. Report of the Expert Workshop to Review the Icelandic Special Permit Research Programme, 18-22 February 2013, Reykjavik, Iceland. *J. Cetacean Res. Manage. (Suppl.)* 15:455-88.

International Whaling Commission. 2015a. Report of the Expert Workshop to Review the Japanese JARPA II Special Permit Research Programme, 24-28 February 2014, Tokyo, Japan. *J. Cetacean Res. Manage. (Suppl.)* 16:369-409.

International Whaling Commission. 2015b. Report of the Scientific Committee. *J. Cetacean Res. Manage. (Suppl.)* 16:1-87.

International Whaling Commission. 2015c. Resolution 2014-5: Resolution on Whaling under Special Permit.2pp.

International Whaling Commission. 2016a. Report of the Expert Panel to Review the Proposal by Japan for NEWREP-A, 7-10 February 2015, Tokyo, Japan. *J. Cetacean Res. Manage. (Suppl.)* 17:507-54.

International Whaling Commission. 2016b. Resolution 2016-2: Resolution on Whaling under Special Permit. *Report of the 66th Meeting of the International Whaling Commission* 2016: 47-49.

International Whaling Commission. 2017. Report of the Expert Panel of the final review on the western North Pacific Japanese Special Permit programme (JARPN II). *J. Cetacean Res. Manage. (Suppl.)* 527-592.

Appendix 4.1

CHECKLIST: DOES THE NEW PROPOSAL INCLUDE THE FOLLOWING ELEMENTS?

1. EXECUTIVE SUMMARY	***Y***	***N***	***n/a***
• A short summary of the proposed programme (about 2 pages) covering:			
a. Primary, Secondary (and, if appropriate Ancillary) objectives and their importance;	□	□	□
b. evaluation of the use of lethal sampling instead of non-lethal methods (by objective) if it requires lethal sampling;	□	□	□
c. species to be taken and sample size by study area and year (and targeted component of population if applicable);	□	□	□
d. summary of effect of catches on targeted stock(s);	□	□	□
e. summary of co-operative research provisions.	□	□	□
2. OBJECTIVES OF THE STUDY	***Y***	***N***	***n/a***
• Identification of objectives of the programme:			
a. statement objectives have been quantified to the extent possible;	□	□	□
b. objectives are arranged into two or three categories, as appropriate: 'Primary', 'Secondary' and 'Ancillary';	□	□	□
c. statement regarding relationships amongst objectives (where applicable);	□	□	□
d. statement for each objective as to whether it requires lethal sampling, non-lethal methods or a combination of both (note that the justification is provided under Section 3);	□	□	□
e. a brief explanation of the value of at least each primary objective in the context of these broad categories:	□	□	□
i. improvement in the conservation and management of whale stocks,	□	□	□
ii. improvement in the conservation and management of other living marine resources or the ecosystem of which the whale stocks are an integral part; and/or,	□	□	□
iii. testing of hypotheses not directly related to the management of living marine resources; and	□	□	□
f. for e(i) and e(ii), at least for each primary objective, information (quantitative where possible) on the contribution made to *inter alia*:	□	□	□
i. past recommendations of the Scientific Committee;	□	□	□
ii. the completion of the Comprehensive Assessment or in progress or future in-depth assessments;	□	□	□
iii the carrying out of *Implementations* or *Implementation Reviews* of the RMP or AWMP;	□	□	□
iv. improved understanding of other priority issues as identified in the Scientific Committee Rules of Procedure or in its reports; and	□	□	□
v. recommendations of other intergovernmental organisations.	□	□	□
3. STUDY AREA(S), SAMPLE SIZE AND SAMPLING DESIGN	***Y***	***N***	***n/a***
• For each objective:			
o ~~Explanation~~ ***Evaluations*** (quantitative where possible) that the objectives of the study can be achieved by the methods proposed;	□	□	□
o **Specification of the appropriate study areas;**	□	□	□
o **Specification of the quantities of interest (e.g. parameters used in models) that need to be determined to achieve the objective where applicable;**	□	□	□
o ***Current state of knowledge about the quantities to be estimated including their uncertainty;***	□	□	□
o **Specification of the sources of uncertainty in the estimation of each quantity of interest and which of these are functions of sample size (including consideration of methods e.g. lethal and non-lethal techniques);**	□	□	□
o **Explanation of the calculations used to determine the optimal sampling design and sample size;**	□	□	□
o ***Potential magnitude of improvements in conservation and management outcomes (where appropriate).***			
• A summary of the overall justification (this may include logistical as well as scientific considerations and should focus on key parameters necessary to meet objectives) for: final study area, sampling design and sample size (explanation provided on how considerations by objective were integrated into the final overall sampling design and sample size).	□	□	□
4. ASSESMENT OF POTENTIAL EFFECT OF CATCHES	***Y***	***N***	***n/a***
• Provide by species/area:			
o a summary of what is known concerning stock structure;	□	□	□
o the estimated abundance of the species/stocks, including methods used and an assessment of uncertainty, with a note as to whether the estimates have previously been considered by the Scientific Committee;	□	□	□
o provision of the results of a simulation study on the effects of the permit takes on the stock that takes into account uncertainty and projects: (1) for the expected life of the permit (i.e. *n* years); and (2) for situations where the proposal is assumed to continue for: (a) a further *n* years; (b) a further 2*n* years; and (c) some longer period of years since the start of the proposal.	□	□	□
5. FIELD AND ANALYTICAL METHODS	***Y***	***N***	***n/a***
• **Description of field methods (by species/stock):**			
o sampling protocol for lethal and non-lethal aspects of the proposal including number, time-frame, area (including protocol to deal with predictable difficulties e.g. prolonged poor weather);	□	□	□
o an assessment of why non-lethal methods, methods associated with any ongoing commercial whaling, or analyses of past data have been considered to be insufficient;	□	□	□
• **Description of laboratory methods;**	□	□	□
• **Description of analytical methods (for novel techniques details may be provided in an Annex to allow full evaluation):**			
o characterisation of assumptions, key parameters, methods to deal with uncertainty, statistical power;	□	□	□
o an assessment of why non-lethal methods, methods associated with any ongoing commercial whaling, or analyses of past data have been considered to be insufficient;	□	□	□
• **Description of use of data from other projects or programmes.**	□	□	□
6. LOGISTICS AND PROJECT MANAGEMENT	***Y***	***N***	***n/a***
• **Description of intermediate targets to allow for adequate review of progress relative to objectives.**	□	□	□
• **Description of overall project management including personnel and logistic resources.**	□	□	□
CO-OPERATIVE RESEARCH	***Y***	***N***	***n/a***
• Assessment of the degree to which the programme will coordinate its activities with related research projects:			
o assessment of whether the degree of coordination is sufficient to ensure field and analytical methods were appropriate and best practice to achieve the stated objectives;	□	□	□
o whether the degree of coordination is sufficient to avoid unnecessary duplication;	□	□	□
• A note on the provisions for co-operative research:			
o field studies;	□	□	□
o analytical studies.	□	□	□
CONCLUSIONS	***Y***	***N***	***n/a***
• A summary evaluation of the proposed programme in the light of Annex P.	□	□	□
ANNEXES	***Y***	***N***	***n/a***
• Field protocols (and if relevant how these compare with IWC guidelines).	□	□	□
• Laboratory protocols (and if relevant how these compare with IWC guidelines).	□	□	□
• Analytical details for new approaches or models (including formulae for estimating parameters of interest and how uncertainty was dealt with).	□	□	□
• A list (by objective) of collaborating institutes, expert, projects or external data sources.	□	□	□

Appendix 4.2

CHECKLIST: DOES THE PERIODICAL OR FINAL REPORT INCLUDE THE FOLLOWING ELEMENTS?

1. EXECUTIVE SUMMARY	***Y***	***N***	***n/a***
• A short explanation of the contributions of the programme in light of the topics covered by Annex P:	□	□	□
(a) Assessment of the extent of the programme's scientific output, and whether this was appropriate in light of the stated research objectives and the time elapsed;	□	□	□
(b) Assessment of the degree to which the programme coordinated its activities with related research projects; this included assessment of whether the degree of coordination was sufficient to ensure that the field and analytical methods were appropriate and best practice to achieve the stated objectives and whether the degree of coordination was sufficient to avoid unnecessary duplication;	□	□	□
(c) Evaluation of other contributions to important research and information needs that were not part of the original set of objectives of the research programme;	□	□	□
(d) Consideration of any other relevant matters as decided by the Scientific Committee;	□	□	□
(e) Evaluation of whether the initial, or revised, objectives of the research were met, and the extent to which results have led to demonstrated improvements in the conservation and management of whales, for broad categories of objectives 1 ('improve the conservation and management of whale stocks') and 2 ('improve the conservation and management of other living marine resources or the ecosystem of which the whale stocks are an integral part').	□	□	□
(f) Summary of the results of programme by Objective and Sub-objectives with an indication of any limitations	□	□	□
2. INTRODUCTION ON OBJECTIVES	***Y***	***N***	***n/a***
• Identification of Objectives and Sub-objectives of the programme;	□	□	□
• A short background as to why they are important.	□	□	□
3. STUDY AREA(S), SAMPLE SIZE AND SAMPLING DESIGN	***Y***	***N***	***n/a***
• A summary of the justification for sample sizes, design and sampling areas (this may include logistical as well as scientific considerations);	□	□	□
• A summary of the justification for any changes to the above over the period of the programme (this may include logistical as well as scientific considerations)	□	□	□
• A summary of how well the achieved sampling matched the proposed sampling (in terms of design and size)	□	□	□
For programmes with multiple objectives,			
• Specification of the appropriate study areas to address each objective;	□	□	□
• Specification of the quantities of interest that need to be determined to achieve each objective where applicable;	□	□	□
• Specification of the sources of uncertainty in the estimation for each quantity of interest and which of these are/were functions of sample size;	□	□	□
• Explanation of the calculations used to determine the optimal sampling design and sample size for each objective (including consideration of methods e.g. lethal and non-lethal techniques) and then how this was integrated into the final sampling design and sample size;	□	□	□
• An overview of how the achieved sampling followed the proposed design and numbers (and an explanation as to why if it did not);	□	□	□
• An analysis of the effect of sample size changes (if they occurred during the programme) on the ability to meet objectives and sub-objectives	□	□	□
4. A CHAPTER FOR EACH OBJECTIVE CONTAINING:	***Y***	***N***	***n/a***
• The field methods;	□	□	□
• The laboratory methods;	□	□	□
• Use of data from other projects or programmes;	□	□	□
• The analytical methods (including an explanation of assumptions, key parameters, how uncertainty was accounted for the previous three bullet points and estimates of statistical power);	□	□	□
• The results;	□	□	□
• A discussion of the importance of the results (including caveats about conclusions that can be drawn) and how these add to and/or compare with related research from other regions;	□	□	□
• An evaluation (for the overall objective) of the results in light of the topics covered by Annex P.	□	□	□
5. ADDITIONAL RESEARCH	***Y***	***N***	***n/a***
• A summary of any results and studies that were completed that used data from the programme but was not addressing the objectives of the programme itself	□	□	□
6. CO-OPERATIVE RESEARCH	***Y***	***N***	***n/a***
• A note on the provisions for co-operative research:			
o field studies;	□	□	□
o Analytical studies.	□	□	□
7. CONCLUSIONS	***Y***	***N***	***n/a***
• An evaluation for the programme as a whole in the light of the topics covered by Annex P;	□	□	□
• Consideration of any other scientific issues that arose from the programme.	□	□	□
8. ANNEXES	***Y***	***N***	***n/a***
• Field protocols (and if relevant how these compare with IWC guidelines).	□	□	□
• Laboratory protocols (and if relevant how these compare with IWC guidelines).	□	□	□
• A list of samples and data collected, and samples analysed by technique.	□	□	□
• Analytical details for new approaches or models (including formulae for estimating parameters of interest and how uncertainty was dealt with).	□	□	□
• The predetermined tracklines for sampling and sightings surveys and the rationale for those lines - for each year (and season if appropriate).	□	□	□
• The actual coverage of those tracklines and the rationale for any decisions taken to deviate from the predetermined lines including the rationale for any new lines developed.	□	□	□
• An evaluation of how representative the realised samples may be of the study area and the biological populations involved.	□	□	□
• A list (by objective) of collaborating institutes, expert, projects or external data sources.	□	□	□
• A list and PDF copies (by objective, or for other research, topic) of published papers that use data from the programme.	□	□	□
• A list and PDF copies (by objective, or for other research, topic) of primary papers that use data from the programme that have been presented at international meetings, including the IWC Scientific Committee.	□	□	□

Appendix 4.3

~~SOME SUGGESTIONS FOR POTENTIAL~~ GUIDELINES FOR AN INTEGRATED FINAL REPORT FROM A SPECIAL PERMIT PROGRAMME[50]

These guidelines are intended to assist proponents as well as reviewers ***in drafting an integrated final report from a Special Permit programme***. ***However, they could prove useful to draft periodic reports as well.*** It should be noted that several of the sections should easily be taken from the original proposal and any periodic reviews. Electronic copies of the full report, its annexes and all listed peer-review papers and cited documents should be submitted to the Secretariat according to the timeline defined in Table 1***a, 1b*** and 2 (section 4.2.1).

1. EXECUTIVE SUMMARY

This should be short summary (usually no more than 3-4 pages) of the results of ***the*** programme by Objective and Sub-objectives with an indication of any limitations and a short explanation of the contributions the programme in the following areas:

(a) The extent of the programme's scientific output, and whether this was appropriate in light of the stated research objectives and the time elapsed;

(b) The degree to which the programme coordinated its activities with related research projects; this included assessment of whether the degree of coordination was sufficient to ensure that the field and analytical methods were appropriate and best practice to achieve the stated objectives and whether the degree of coordination was sufficient to avoid unnecessary duplication;

(c) Other contributions to important research and information needs that were not part of the original set of objectives of the research programme;

(d) Any other relevant matters as decided by the Scientific Committee; and

(e) How well the initial, or revised, objectives of the research were met, and the extent to which results have led to demonstrated improvements in the conservation and management of whales, for broad categories of objectives 1 ('improve the conservation and management of whale stocks') and 2 ('improve the conservation and management of other living marine resources or the ecosystem of which the whale stocks are an integral part').

2. INTRODUCTION

This should include:

(a) identification of Objectives and Sub-objectives and any changes to these over the period of the programme;

(b) short background as to why they are important and why changes were made if they occurred.

3. STUDY AREA(S), SAMPLE SIZE AND SAMPLING DESIGN

This chapter should contain (a) a summary of the justification for sample sizes, design and sampling areas, including any changes to these over the period of the programme (this may include logistical as well as scientific considerations); and (b) a summary of how well the achieved sampling matched the proposed sampling (in terms of design and size).

For programmes with multiple objectives this should include:

(a) specification of the appropriate study areas to address each objective;
(b) specification of the quantities of interest that need to be determined to achieve each objective;
(c) specification of the sources of uncertainty in the estimation for each quantity of interest and which of these were functions of sample size;
(d) explanation of the calculations used to determine the optimal sampling design and sample size for each objective (including consideration of methods e.g. lethal and non-lethal techniques) and then how this was integrated into the final sampling design and sample size;
(e) an overview of how the achieved sampling followed the proposed design and numbers (and an explanation as to why if it did not); and
(f) An analysis of the effect of sample size changes (if they occurred during the programme) on the ability to meet objectives and sub-objectives.

Details should be provided as an Annex or Annexes as described in a later section.

4. A CHAPTER FOR EACH OBJECTIVE CONTAINING:

[50] ***This appendix is based on Annex G of the Report of the Expert Panel of the final review on the western North Pacific Japanese Special Permit programme (JARPN II) (IWC 2017, pp. 527-59).***

These chapters should be self-contained to the extent possible and contain sufficient levels of detail (first with sections by sub-objective if appropriate and then integrated over the main objective) to allow a review of:

(a) the field methods (and difficulties encountered - any uncertainty arising from this should be covered under (c) below);

(b) the laboratory methods (and difficulties encountered any uncertainty arising from this should be covered under (c) below);

(c) use of data from other projects or programmes (and any uncertainty arising from this - which should also be covered under (c) below);

(d) the analytical methods (including an explanation of assumptions, key parameters, how uncertainty was accounted for);

(e) the results;

(f) a discussion of the importance of the results (including caveats about conclusions that can be drawn) and how these add to and/or compare with related research from other regions; and

(g) an evaluation (for the overall objective) of the results in light of the topics covered by Chapter 3.

Self-contained chapters contain a sufficient level of detail that the reader does not have to frequently consult other material to evaluate the work – similar to the level of detail provided in a published paper. If a programme has already published papers in peer-reviewed journals comprising all or most of its results these chapters can be made by the sum of these papers with a short introduction and an overall conclusion.

5. ADDITIONAL RESEARCH

This chapter should contain a summary of any results and studies that were completed that used data from the programme but was not addressing the objectives of the programme itself.

6. CONCLUSIONS

This should include at least an evaluation for the programme as a whole in the light of the topics covered by Chapter 3 plus consideration of any other scientific issues that arose from the programme.

ANNEXES

The Final Report should include a number of Annexes including the following.

(1) Field protocols (and if relevant how these compare with IWC guidelines).

(2) Laboratory protocols (and if relevant how these compare with IWC guidelines).

(3) A list of samples and data collected, and samples analysed by technique.

(4) Analytical details for new approaches or models (including formulae for estimating parameters of interest and how uncertainty was dealt with).

(5) For each year (and season if appropriate):

(a) the predetermined tracklines for sampling and sightings surveys and the rationale for those lines;

(b) the actual coverage of those tracklines and the rationale for any decisions taken to deviate from the predetermined lines including the rationale for any new lines developed; and

(c) an evaluation of how representative the realised samples may be of the study area and the biological populations involved.

(6) A list (by objective) of collaborating institutes, expert, projects or external data sources.

(7) A list (by objective, or for other research, topic) of published papers that use data from the programme (copies should be archived with the IWC Secretariat).

(8) A list (by objective, or for other research, topic) of working papers that use data from the programme that have been presented at international meetings, including the IWC Scientific Committee (copies should be archived with the IWC Secretariat).

It is assumed that the report will be in electronic format so (a) links can be given and (b) that much of this information will have been developed by the proponents at the start of the programme anyway (e.g. protocols).

Appendix 4.4

Table 1: Example timetable for the review of a new Special Permit proposal

Example timetable for the review of a new Special Permit proposal where the proposal is received at least six months before the Scientific Committee meeting held in the **same** year as a Commission meeting where the Scientific Committee starts on 1 June 2022 (a). If the proposal is received over 18 months prior to Annual Meeting held in the same year as a Commission meeting (e.g. by 30 November 2020), either timetable (b) or (c) would be followed. If the timetable (c) was followed (i.e. a workshop held on 22 February 2021), this would allow an extra year for proponents to refine their responses to any recommendations from the Expert Panel or the Committee, if necessary, before the Committee's evaluation is presented to the Commission in 2022.

The column with example dates (a) assumes proposal submitted 6 months ahead, that with example dates (a_1) assumes proposal submitted 9 months ahead and that the Workshop is held 100 days prior to the annual meeting and that with example dates (a_2) assumes proposal submitted 9 months ahead and that the Workshop is held 140 days prior to the annual meeting.

Action	Schedule of events	Example dates (a)	*Example dates (a_1)*	*Example dates (a_2)*	Example dates (b)	Example dates (c)
(1) Chair receives Special Permit proposal from proponents (proponents can request that it is confidential)	At least 6 months but ideally at least 9 months prior to Annual Meeting	30 November 2021	*30 August 2021*	*30 August 2021*	30 November 2020	30 November 2020
(2) Proponents submit document summarising the data (and format/resolution) used to justify the proposal's design and impact on stocks – Procedure B of the Data Availability Agreement applies	At least 6 months but ideally at least 9 months prior to Annual Meeting	30 November 2021	*30 August 2021*	*30 August 2021*	30 November 2020	30 November 2020
(3) Chair distributes proposal to Vice-Chair, Head of Science, SSG and Scientific Committee	within 1 week of receipt	7 December 2021	*7 September 2021*	*7 September 2021*	7 December 2020	7 December 2020
(4) SSG suggest names for the Expert Workshop to the Chair	within 2 weeks	21 December 2021	*21 September 2021*	*21 September 2021*	21 December 2020	21 December 2020
(5) Chair, Vice-Chair and Head of Science develop proposed list of experts and reserves and send to SSG	within 2 weeks	4 January 2022	*4 October 2021*	*4 October 2021*	4 January 2021	4 January 2021
(6) Final comments from SSG to Chair	within 1 week of sending list to SSG	11 January 2022	*11 October 2021*	*11 October 2021*	11 January 2021	11 January 2021
(7) Final Panel selected and invitation and documents sent to them by Chair	within 2 weeks of sending list to SSG	18 January 2022	*18 October 2021*	*18 October 2021*	18 January 2021	18 January 2021
(8) Scientific Committee observers indicate interest to the Chair in participating in the Workshop	At least 50 days before Workshop	4 January 2022	*4 January 2022*	*24 November 2021*	4 January 2021	4 January 2021
(9) Committee member's reviews/analyses due at the Secretariat	At least 30 days before Workshop	25 January 2022	*25 January 2022*	*14 December 2021*	25 January 2021	25 January 2021
(11) Committee member's reviews/analyses sent to Specialists and Proponents by Secretariat	Within 1 week	1 February 2022	*1 February 2022*	*21 December 2021*	1 February 2021	1 February 2021
(13) Hold Workshop	>100 days prior to Annual Meeting (Column (c) >140 days)	22 February 2022	*22 February 2022*	*12 January 2022*	22 February 2021	22 February 2021 or 2022
(14) Final Workshop report made available to Proponents by Chair	20 days after the workshop	13 March 2022	*13 March 2022*	*1 February 2022*	13 March 2021	13 March 2021 or 2022
(15) Proponents comments on report sent to Chair	40 days after the workshop (Column (c) 70 days after workshop	1 April 2022	*1 April 2022*	*19 March 2022*	1 April 2021	1 April 2021 or 2022
(16) Distribution of the Proposal, Workshop report and comments from Proponents to the Committee by the Secretariat	>40 days prior to Annual Meeting (Column (c) 55 days prior)	22 April 2022	*22 April 2022*	*8 April 2022*	22 April 2021	22 April 2021 or 2022
(17) Any further Committee member's reviews/analyses due at the Secretariat	Committee document deadline	25 May 2022	*25 May 2022*	*25 May 2022*	25 May 2021	25 May 2021 and 2022
(18) Any additional analyses by Proponents in response to Expert Panel recommendations	Committee document deadline	25 May 2022	*25 May 2022*	*25 May 2022*	25 May 2021	25 May 2021 and 2022
(19) Discussion within the Committee	Annual Meeting	From 1 June 2022	*From 1 June 2022*	*From 1 June 2022*	From 1 June 2021	From 1 June 2021 and 2022
(20) Submit evaluation to the Commission meeting via Annual report	About two weeks after meeting	28 June 2022	*28 June 2022*	*28 June 2022*	28 June 2021	28 June 2022

Table 2: Example timetable for the periodic and final review of Special Permit programs

Example timetable for the periodic and final review of Special Permit programs where review documents are received at least six months before the Scientific Committee meeting held in the **same** year as a Commission meeting where the Scientific Committee starts on 1 June 2022 (a). If the review documents are received over 18 months prior to a Commission meeting (e.g. by 30 November 2020), either timetable (b) or (c) would be followed. If the timetable (c) was followed (i.e. a workshop held on 22 February 2021), this would allow an extra year for proponents to refine their responses to any recommendations from the Expert Panel or the Committee, if necessary, before the Committee's evaluation is presented to the Commission in 2022.

Action	Schedule of events ***(max time lapsed after the previous event in the list)***	Example dates (a)	Example dates (b)	Example dates (c)
Announce intention to conduct periodic and final reviews	***24 months prior to discussion of Expert Panel report and Proponent proposal at an*** Annual Meeting	1 June 2020	1 June 2019	1 June 2019
Proponents submit a preliminary data description document explaining the data to be available for the ***Expert*** Workshop	2 months before the Annual Meeting prior to the Workshop	1 April 2021	1 April 2020	1 April 2020
Requests for use of data submitted as papers	4 weeks prior to meeting	4 May 2021	4 May 2020	4 May 2020
Final data description documents and data themselves available in electronic form	1 month after end of Annual Meeting	14 July 2021	14 July 2020	14 July 2020
Information on likely analytical methods to be submitted to the Workshop sent to the Secretariat	9 months prior to Annual Meeting	31 August 2021	31 August 2020	31 August 2020
Distribute documents to Vice-Chair, Head of Science and SSG	(1 week)	7 September 2021	7 September 2020	7 September 2020
SSG suggest names for the specialist Workshop	(2 weeks)	21 September 2021	21 September 2020	21 September 2020
Announcement of review to IWC and call for observers		12 October 2021	12 October 2020	12 October 2020
Chair, Vice-Chair and Head of Science develop list of specialists and reserves	(2 weeks)	12 October 2021	12 October 2020	12 October 2020
Final comments from SSG	(1 week)	19 October 2021	19 October 2020	19 October 2020
Invitation and documents to specialists	(1 week)	26 October 2021	26 October 2020	26 October 2020
Indications of interest by Scientific Committee observers		2 November 2021	2 November 2020	2 November 2020
Receipt and circulation of results/review documents from Special Permit research (including to IWC Scientific Committee members)	>6 months prior to Annual Meeting	30 November 2021	30 November 2020	30 November 2020
Observers confirm wish to attend		3 December 2021	3 December 2020	3 December 2020
Committee member's reviews/analyses due at the Secretariat	(1 month)	4 January 2022	4 January 2021	4 January 2021
Committee member's reviews/analyses sent to Specialists and Proponents		11 January 2022	11 January 2021	11 January 2021
Hold Workshop	>100 days prior to Annual Meeting	22 February 2022	22 February 2021	22 February 2021 or 2022
Final Workshop report made available to Proponents	>80 days prior to Annual Meeting	13 March 2022	13 March 2021	13 March 2021 or 2022
Distribution of result documents, Workshop report and comments from Proponents to the ***Committee by the Secretariat***	***60 days after the workshop and*** >40 days prior to Annual Meeting	22 April 2022	22 April 2021	22 April 2021 or 2022
Any further Committee member's reviews/analyses due at the Secretariat†	***Committee deadline for document submission***	***25 May 2022***	25 May 2021	25 May 2021 and 2022
Additional analyses by Proponents in response to Expert Panel recommendations‡	***Committee deadline for document submission***	25 May 2022	25 May 2021	25 May 2021 and 2022
Discussion within the Committee	Annual Meeting	From 1 June 2022	From 1 June 2021	From 1 June 2021 and 2022
Submit evaluation to ***the*** Commission via Annual report	As soon as SC report available	28 June 2022	28 June 2021	28 June 2022

*Normally to the nearest Friday.

†Such analyses and discussions may arise at following Committee meetings

‡Proponents may also respond to recommendations arising from the Committee's and Panel's reviews in following meetings

Appendix 5

JAPAN'S STATEMENT CONCERNING THE PROPOSED REVISIONS OF ANNEX P, ESPECIALLY ON ITS OPPOSITION TO REFLECT RESOLUTION 2016-02

Japan did not block the consensus of the modification of Annex P for the following reasons. First, the timing of submission of proposal and its review process (commencement through completion) is not limited to the same year as a Commission meeting, as is confirmed in *Option 3* and *4* of Table #.1 of Annex P. Second, Japan's concern on the unrestricted and continuing access to all data collected under special permit programs has been resolved in a reasonable manner.

However, Japan reiterates its position that Resolution 2016-2 should not be given effect, because there is no scientific reason to add the engagement of the Commission to the review process, and making such modification with a resolution would be inconsistent with Paragraph 30 of the Schedule and the Convention. It must also be noted that the said resolution was adopted with significant number of objections and abstentions.

For these reasons, Japan maintains the position that no reference to Resolution 2016-2 should be made in Annex P. However, Japan did not oppose the proposed text as a compromised solution, with the spirit of cooperation.

Japan has always cooperated in good faith with the process of review by the Scientific Committee. Japan appreciates the engagements of scientists who have been offering constructive opinions to ensure scientific integrity and soundness of special permit programs. On the other hand, Japan cannot but note that scientific discussions have too often been frustrated by political interventions at Commission meetings during the history of the IWC. Therefore, while Japan always respects and welcomes revisions of Annex P to make the process more scientifically constructive both for the proponents and reviewers, Japan cannot agree to a proposal that invites political interventions to the review process.

When the draft of the Resolution 2016-2 was discussed at the IWC/66, Japan expressed its objection thereto as it was aimed, together with Resolution 2014-5, at unduly limiting the implementation of Special Permit scientific research programs regardless of scientific value and in a manner inconsistent with the Convention. Japan emphasized that it is Paragraph 30 of the Schedule that sets out the binding procedure for review of Special Permit proposals.

Resolution 2016-2 also requests unrestricted and continuing access to all data collected under special permit programs. However, such request for data access, particularly for those used for the development of the new program, is overly stringent compared to the ordinary process of scientific peer review where access to raw data is not requested taking due account of the property rights.

Resolution 2016-2 was nonetheless adopted by vote at the IWC/66, despite the opposition of a significant number of Member States (17 votes against) and with a significant number of abstentions (10). Japan's view remains unchanged and is that Resolution 2016-2 is an attempt to add further conditions, not envisaged under the Convention and its Schedule, for granting special permits. Implementation of Resolution 2016-2 would in effect modify the current review process, by granting the Commission a power it does not have under the Convention and its Schedule.

Japan reiterates its full commitment to cooperating with the Scientific Committee in accordance with the Convention and its Schedule. Japan will thus continue to share information and to discuss the scientific aspects of its Special Permit researches, as it has always done, in a manner consistent with the Convention.

CHAPTER 5

SCIENTIFIC COMMITTEE BUDGET RECOMMENDATIONS: PROCESSES TO SELECT ACTIVITIES AND MANAGE FUNDS

The process for developing the Scientific Committee budget recommendation to the Commission and all related guidelines for the evaluation of proposals on research activities have evolved through time. With respect to the currently agreed procedures for developing the Scientific Committee budget recommendation to the Commission, this was first developed in 2014 (IWC 2015, JCRM 16: 357-358) and finalised in 2015 (IWC 2016, JCRM 17: 431-436). The procedure concerning the Small Cetacean Research Conservation Fund was developed in 2010 (IWC 2011, JCRM 12:289-290) and finalised intersessionally (IWC 2012; JCRM 13:282-284). The procedure on the Southern Ocean Research Partnership (IWC-SORP) was developed in 2010 (IWC 2011, JCRM 12:352-355) and amended in 2016 (IWC 2017, JCRM 18:455) and 2017 (IWC 2018, JCRM 19:422-423). In 2018, the Commission endorsed some amendments to the Commission and Scientific Committee Rules of Procedure (NEW REFERENCE/LINK) recognise some key steps of these processes.

In 2017, the Committee also developed technical guidelines on new proposals for data bases (IWC 2018, JCRM 19:399-404).

5.1 Research Fund

Each biennium, the Commission approves a research budget for the Scientific Committee for activities that the Committee believes are essential to its work in providing the best scientific advice to the Commission (Financial Regulations Rule C, SC RoP G.1, G.3). This includes *inter alia* Workshops, data processing, data collection and collation (SC RoP H), analyses and the costs of inviting experts to annual and intersessional meetings.

All research funds have an allowance for dealing with contingencies and emergency situations. See Table 5.1.1 for more detail on this matter. Reports on all funds (i.e. Research fund and Voluntary funds; see Table 5.1.1) are submitted annually to the Scientific Committee Plenary. All relevant information on their balance, including necessary adjustments, is reported to the Commission via the Committee annual report.

Table 5.1.1: Summary of Funds available to support Scientific Committee activities and relevant coordinating bodies

Fund name	*Fund coordinating body*	*Contingency fund per year*	*Contingency fund coordinating officers*
Research Fund	SC plenary, Convenors, HDs	10% [under consideration of the Commission]	SC Chair and Vice-Chair, relevant convenors, Head of Science/Secretary
Voluntary Fund for Small Cetaceans' Research and Conservation	SM Review group	10% [under consideration of the Commission]	SM Review group: SC Chair and Vice-Chair, SM Convenor/s, IWC Head of Science, and a number of competent SC members who provide a wide geographical scope and relevant expertise
Voluntary Research Fund on Southern Ocean Research Partnership	IWC-SORP Scientific Steering Committee (SSC), IWC-SORP Assessment Panel	15,000	IWC-SORP SSC: a representative, with technical expertise, nominated by each member nation of the Partnership, SH Convenor/s o, SC Chair, IWC Head of Science, IWC-SORP Secretariat and CCAMLR observer to IWC Scientific Committee.
Voluntary Fund for Aboriginal Subsistence Whaling	SC plenary, Convenors, HDs	None	SC Chair and Vice-Chair, relevant convenor, Head of Science/Secretary

5.1.1 Process for Developing a Consensus Budget Recommendation to the Commission

In 2015 the Committee finalised a new approach to Improve the Scientific Committee's process for developing a consensus Budget recommendation to the Commission, endorsed in 2016. This new procedure is generally applied in years when the Commission meets and includes the following steps:

STEP 1: SUB-GROUPS EVALUATE, PRIORITISE AND RANK EACH BUDGET REQUEST/PROPOSAL

The precise mechanism for doing this is the responsibility of the individual sub-groups and their report will explain their approach as well as the result. Each request to the sub-group is filled in the appropriate *proforma* (see section 5.1.3), which includes information on objectives, relevance to work of the Scientific committee and its relevant sub-group, methods, deliverables, work plan, budget breakdown, in-kind support, etc.

Prior to submission of a project with a budget exceeding £20,000 the proponent should consult with the Chair, Vice-Chair and Head of Science to receive guidance, for example, on the relevance of the project to the Scientific Committee, the appropriateness of the budget, the likelihood of success.

The evaluation and prioritisation process should be initiated as early as possible within the sub-group. Whatever mechanism is agreed by the sub-group it should consider factors such as conflict of interest. Caution should also be used for projects proposed by active members of the Scientific Committee. The Scientific Committee should have in place safeguards to ensure all proposals are subject to equal scrutiny and challenge. This will maintain the integrity of the Scientific Committee by ensuring necessary

transparency in the handling of possible conflicts of interest. The use of the agreed evaluation criteria (or scoring/prioritisation sheet) helps to ensure this. There is also the possibility of the Convenor, in consultation with the sub-group, requesting the process be completed anonymously by all members of the group, particularly for controversial cases. In general, proponents should be asked to leave the room when their proposal is discussed.

The evaluation process to prioritise proposals is conducted using the agreed evaluation criteria (see section 5.1.3) and considers such factors as relevance to work of the sub-group, likelihood of success, value for money, timeline etc. Please note that not all projects with a good/sufficient score can be funded nor is the arithmetic ranking fully reflected in the final funding decision. The final decision is taken on the basis of a thorough and fair discussion beyond that of the simple scoring process. The prioritisation process should occur towards the end of the sub-group meeting, so that it can be considered in terms of factors such as the sub-groups two-year work plan and the Scientific Committee's two-year budget. Where appropriate it may also consider the outcomes of previous similar or related proposals or proposals by the same authors/groups. The sub-group may decide to comment on implications of delaying some proposals or parts of some proposals. Where proposals are not deemed worthy of funding or considered a priority at this time by the sub-group, the rationale will be given.

Proponents together with the sub-groups shall also consider possibilities to reduce budgets in light of the necessity of cuts being made during the following steps, especially considering the two-year period. The sub-group report will contain a short summary of all of the proposals, evaluation, costs and ranking. The full *proformas* are also made available to the full Committee by the Secretariat. A table summarising all budget requests will be included at the end of each sub-group report and also sent directly to the Vice-Chair.

STEP 2: SCIENTIFIC COMMITTEE VICE-CHAIR, CHAIR AND CONVENORS

The Vice-Chair (in conjunction with the SC Chair and convenors) compiles an overall budget summary document including a short summary of the objectives of each proposed item for funding. If the total does not exceed the expected budget available and each item meets the required scientific, administrative and logistic standards (Chair and Convenors will briefly reconsider all proposals), the total budget shall be provided to the Committee for its final approval.

If there is an overrun the Chair informs the Committee immediately and moves to Step 3.

STEP 3: REDUCED BUDGET

The Chair and Convenors develop a draft Reduced Budget by considering inter alia:

(1) implications of delaying funding for a particular project;
(2) implications for future years' budgets (beyond the current two-year process): long-term projects that are likely to require ongoing funding should be clearly identified;
(3) implications for the overall work of the Scientific committee;
(4) any expected wider benefit of funding overall commission objectives; and
(5) decisions from previous years (consideration is to be given to meritorious proposals rejected/ postponed in a previous year, if their value is high in the new ranking).

Among equally important activities that suffer cuts, as good practice, cuts in different years should not pertain always to the same activities/sub-groups, but they should be equally spread in the long-term.

STEP 4: DISCUSSION ON DRAFT REDUCED BUDGET IN PLENARY

This Reduced Budget is submitted to the full Committee as soon as possible (and no later than 6pm the day before it is to be discussed), along with an explanation for the proposed reductions. The draft Reduced Budget is discussed by the Committee no later than the morning of the last day of Plenary. Every effort should be made to reach consensus.

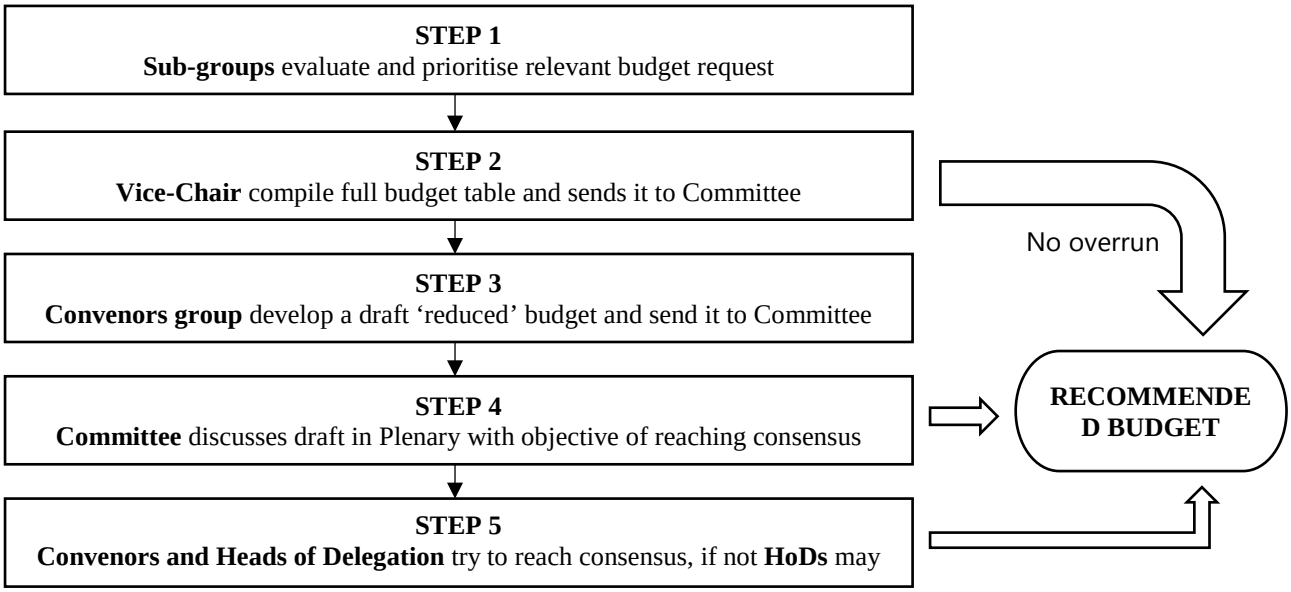
If consensus is reached, the Reduced Budget is included in the Committee's report and the process described (i.e. details are provided on why reductions where applied for each of the affected projects). A summary of the full set of submitted proposals is also included in the report.

If consensus cannot be reached then Step 5 will be followed.

STEP 5: CHAIR AND CONVENORS AND HEADS OF DELEGATION

The Scientific Committee Chair, Convenors and Heads of Delegation reach a final decision, taking fully into account the discussions thus far. If consensus cannot be reached, Head of Delegations vote on a way forward and options are submitted to the Commission, and the rationale reported in the Committee's report.

However, the agreement is reached, during presentation of the agreed budget to the Commission, a list of all the research/work proposals put forward to the Scientific Committee (with their associated ranking) will be available to the Commission as an appendix to the budget documentation. In case of a cut to the recommended Scientific Committee budget by the Commission, the Scientific Committee Chair, Vice-Chair and Head of Science will proceed to cuts on lower priority activities (identified through this process).



5.1.2 Mid-term and final evaluation of the budget
A mid-term (i.e. after one year) and a final revaluation of the budget is necessary.

In the mid-term, the Chair, Vice-Chair, Head of Science and Secretary present the actual situation on activities completed and provide to the Scientific Committee a simple plan for covering any over expenditure or reallocation of any unspent funds.

The transfer of funds from one activity to another should be made in a way which maintains generally their original intent (e.g. workshop/meetings, research projects, modelling, databases, preparation of technical material for the website, etc.). For example, unspent funds previously assigned to the organisation of a workshop can be transferred to the organisation of another workshop during the same year or the year after. Where small sums are involved (up to £2,000) there may be more flexibility in changing categories to ensure an overall balanced budget.

In case of some foreseen activity that did or will not take place (e.g. modelling no longer useful or no longer possible due to the lack of appropriate experts), the Chair, Vice-Chair, and the Head of Science, in consultation with the Secretary, will propose alternate funding options taking into account the Scientific Committee priorities and projects, which were previously identified by the Scientific Committee, but not selected for funding. These options will be presented to the Scientific Committee for agreement. This concept applies to all research funds (see section 5.2).

5.1.3 Budget request proposal: proformas *and review criteria*
In 2015 and 2017 (IWC 2018, p. 399) the Committee developed new review criteria and *proformas* for budget request proposals, including those for new databases and major alterations to existing databases.

5.1.3.1 *PROFORMA* FOR BUDGET REQUEST PROPOSALS

1. PROPOSAL TITLE

Please provide the title of the project or the name of the workshop/meeting.

2. BRIEF OVERVIEW OF THE PROPOSAL AND ITS EXPECTED OUTCOME

Give a very brief overview (max 150 words) on your proposal and its expected outcomes. Use bullet point to list outcomes. Be succinct and clear as this may be used to summarise your project for the report.

3. RELEVANT IWC SCIENTIFIC COMMITTEE GROUPS OR SUB-GROUPS

List all the IWC Scientific Committee groups or sub-groups that the outcomes of this work would be relevant to and provide a brief (1-2 lines) explanation of how it would contribute more widely to their ongoing programmes of work. Where possible, do not simply list only the sub-committee within which or for which the project proposal was generated.

4. TYPE OF PROJECT

Please tick.

Research project	
Modelling	
Workshop/meeting	
Database creation/maintenance	
Compilation work/editing *(e.g. SOCER, etc.)*	
Other *(please specify below)*	

5. BRIEF DESCRIPTION OF THE PROPOSAL AND ITS CONNECTION WITH SCIENTIFIC COMMITTEE RECOMMENDATIONS (DO NOT EXCEED 1,500 WORDS)

(A) Background, rationale, and relevance to the priorities identified by the IWC Scientific Committee:
Provide a clear explanation of the background and rationale for the proposal and its relevance to Scientific Committee identified priorities. Clearly identify the most relevant and recent Scientific Committee recommendations.
(B) Specific objectives or ToR and deliverables/outcomes:
Provide the specific objectives and the expected deliverables. In the case of workshops and meetings, include the Terms of Reference (ToR) and expected outcomes.
(C) Methodological approach/work plan/administrative details:
Specify the methods to be applied (novel methods require more explanation than standard ones) and the broad work plan – the detailed timetable appears under Item 5 below. *In the case of workshops and meetings, include the broad work plan including any pre-requisites for the workshop/meeting to take place (apart from funding, e.g. completed analyses, papers etc.) and administrative details (e.g. location, dates, number of participants).*
(D) Suggestions for outreach:
Please, note that successful proponents will be requested to produce ad hoc material that will be used by the IWC Secretariat for dissemination and outreach.

6. TIMETABLE FOR ACTIVITIES AND OUTPUTS

Specify the timetable for project activities and expected out puts separately. For projects with multiple distinct elements please indicate interim goals and timeframes. Add as many rows as you need to the tables below. If publications are an expected output please note whether you will submit the manuscript to the IWC's Journal of Cetacean Research and Management.

Activity to be undertaken	Key person(s)	Start (mm/yy)	Finish (mm/yy)

Expected outputs	Completion date (mm/yy)

7. RESEARCHERS' (OR STEERING GROUP) NAME(S) AND AFFILIATION

Please, also specify if the project team has any direct connection (e.g. same research group or institute, collaborator on common project) with people involved or likely to be involved in taking the funding decision (e.g. IWC SC heads of delegations, SC convenors, etc.). Add as many rows as you need to the table below.

Name	Affiliation	Connection with decision

8. TOTAL BUDGET

Breakdown into: (1) salaries/wages (include name/position of each individual and breakdown of time and duties i; (2) travel/subsistence expenses (breakdown by person and justification) unless for IPs for workshops where a total estimate based on an average for the total number of IPs is acceptable; (3) services (e.g. aircraft/vessel time, consultancy fees, ARGOS fees, etc.; (4) reusable capital equipment (e.g. reusable equipment such as a hydrophone, cameras, etc. Note that this equipment will have to be registered at the IWC Secretariat and will remain property of the IWC at the end of the project), (5) expendable capital equipment (e.g. consumables, tags, stationery), (6) shipping costs, (7) insurance costs, (8) in kind co- funding (specify whether other funding is available for personnel/name, equipment, venues, etc.). Note that 'Overheads' are not admissible. Add as many rows as you need to the table below.

Type	Detailed description	Cost in GB pounds
(1) Salaries (by person)		
(2) Travel/subsistence (by person or est. total for IPs)		
(3) Services (by item)		
(4) Reusable equipment		
(5) Consumables		
(6) Shipping (by item)		
(7) Insurance (by item)		
(8) Co-funding		
(9) Other		
Total		

9. DATA ARCHIVING/SHARING

your plans for data archiving and sharing. Note that data collected primarily under IWC grants are considered publicly available after an agreed period of time for publication of papers, usually about two years. The work of the IWC depends on the voluntary contribution of data to the various databases and catalogues IWC supports. Please consult the Secretariat (secretariat@iwc.int).

10. PERMITS

Please tick.

Do you have the necessary permits to carry out the field work and have animal welfare issues been appropriately considered?	
Please, provide any further information in the space below on how the use of animals in the proposed research has been appraised i.e. in light of internationally recognised practices:	
Do you have the appropriate permits (e.g. CITES) for the import/export of any samples?	

If 'Yes' please provide further details and enclose copies where appropriate:

GUIDELINES ON LOGISTICS FOR IWC SCIENTIFIC COMMITTEE WORKSHOPS AND MEETINGS PROPOSALS

Scientists wishing to submit workshop or meeting proposals for the Scientific Committee to consider should address the logistical issues outlined below.

(1) Suggested Steering Group (and possible Chair).
(2) Suggested title for workshop/meeting.
(3) Format of workshop/meeting (e.g. open Symposium followed by 'invitation only' workshop).
(4) Timetable for workshop/meeting (e.g. 2-day open Symposium followed by 5-day 'invitation only' workshop).
(5) Expected number of participants including suggested 'Invited Participants' (areas of expertise and names).
(6) Proposed essential papers/analyses to be available prior to the workshop/meeting and suggestions for who should carry these out (and any associated costs) with timetable.
(7) Draft annotated agenda.
(8) Provisional date and proposed venue.
(9) Estimated budget: this should cover travel and subsistence costs for 'Invited Participants', venue-related costs if any (note: in recent years, the Scientific Committee has rarely covered costs of meeting rooms etc. which are normally covered by the host of the meeting), need for secretarial support from the IWC Secretariat at the meeting.

GENERAL GUIDELINES FOR HOSTING IWC WORKSHOPS AND MEETINGS

All formal correspondence (e.g. invitations to participate, offers of funding, information for participants regarding dates, venue, document numbering etc.) must be circulated via the IWC Secretariat (contact: secretariat@iwc.int cc greg.donovan@iwc.int).

The Secretariat must be informed as soon as the dates and meeting venue have been finalised in order that an IWC Circular can be issued and a specific IWC 'events portal' (https://events.iwc.int/) page established (a minimum of 3 months prior to the workshop/meeting and preferably at least 6 months).

DOCUMENTS

IWC rules and guidelines on documents should be followed with electronic submissions through the meeting portal page established by the IWC Secretariat. Information to Steering Groups and participants will be provided by the Secretariat for agreed workshops/meetings. If developed during a workshop/meeting, working papers (recognising that these will no longer be available at the end of the workshop/meeting) as well as any 'For Info' papers submitted.

TRAVEL INFORMATION/ACCOMMODATION

Please provide the Secretariat with information on suitable accommodation, costs, and if possible, arrangements for group bookings. If possible please provide local travel information (e.g. directions from the airport to the hotel/venue, likely costs, maps, etc.) in order that this can be circulated to participants by the Secretariat.

BUDGET

IWC workshops/meeting may be fully or partially funded by external funders. Offers of funds (e.g. co-financing or full funding and sponsorships) need to be cleared with the Secretariat; IPs letters, budget determination and payment will be handled by the IWC Secretariat. Other costs associated with a meeting must also be cleared with the Secretariat in advance (e.g. related to meeting rooms, copying etc.).

REPORTS

Reports must follow the normal IWC styles (supplied by the Secretariat) and the agreed report (complete with ALL references) sent to the Secretariat in electronic (MS Word) form. Where Secretariat personnel are present they will assist at all stages of report preparation.

WEBSITE

Each workshop has its own IWC webpage, where all meeting documents, information etc. are added as they are received. Please contact secretariat@iwc.int to request any additions (e.g. IWC report extracts) to the webpage.

REVIEW CRITERIA

If a project presents multiple primary objectives which are achieved using sub-projects, a sheet should be used to evaluate each single sub-project. Note that not all criteria are equally applicable depending on the nature of the project (e.g. field work versus workshops).

IWC SCIENTIFIC COMMITTEE PROPOSALS FOR FUNDING - REVIEW CRITERIA				
TITLE OF THE PROJECT/sub-projects:				
PRINCIPAL INVESTIGATOR:				
Key criteria		**Explanation of scoring**	**Score**	**Supporting remarks**
Relevance to Scientific Committee priorities				
1	How well aligned are the scientific outcomes of the project/activity with the current SC priority areas?	1 - Not aligned/poorly aligned (e.g. too vague or generic reference to general SC priorities). 2 - Reasonably aligned (e.g. some aspects may be vague or links are not clear). 3 - Well aligned (e.g. outcomes clearly deliver in the most part on priority areas, may also address longer term or potential future issues). 4 - Closely aligned (e.g. of interest for multiple sub-groups or delivers on specific SC high priority topics/ recommendations in the immediate or short term).		
2	To what extent will the outcomes of the project/activity contribute to improvements in the conservation and management of cetaceans?	1 - Not at all 2 - Poorly 3 - Reasonably or over the longer term 4 - Well or over the medium term 5 - Excellently or to almost immediate effect		
Note: if in each of the two above key criteria under this section the project does not score singularly at least 2 points, do not proceed in further evaluation. Of course, proposals within a sub-group would only be developed if in their estimation scores were of 4 or above.				
Approach and methodology				
3	What degree of scientific merit/value is there in carrying out the work?	1 - Not demonstrated or of low scientific value 2 - Useful/basic scientific value 3 - Very good scientific value 4 - Excellent/innovative scientific value		
4	Is the proposed methodology scientifically sound and feasible in terms of field and analytical methods?	1 - Feasibility unrealistic & poor methodology or not properly addressed. 2 - Feasibility & methodology acceptable but would benefit from some substantial amendments. 3 - Feasibility & methodology good, some small changes beneficial. 4 - Feasibility & methodology excellent or a highly promising innovative approach to an important question facing the Committee.		
5	What is the likelihood of success based on the proposed overall approach and methodology?	1 - No chance of success 2 - Low chance of success/better approaches available 3 - Medium chance of success/some changes to the approach necessary 4 - High chance of success/little or no changes to the approach necessary		
5a	Are objectives of the research likely to be achieved within the proposed time-frame?	1 - No or unlikely 2 - Partially or potentially ambitious 3 - Yes with some minor suggestions 4 - Yes		
5b	Are any proposed intermediary targets timely and achievable?	1 - No or unlikely 2 - Partially 3 - Probably 4 - Yes		

5c	Is the proposed time-frame/work necessary (e.g. can the project produce results in a shorter time period)?	1 - No or unlikely 2 - Partially 3 - Probably 4 - Yes		
5d	Is the sample size adequate to achieve the stated objectives?	1 - Not demonstrated/not properly addressed 2 - No or unlikely (too low/too high) 3 - Probably (additional analysis needed) 4 - Yes		
6	Is the project likely to affect adversely the population(s) involved?	1 - Not properly addressed/ unknown 2 - Yes severely 3 - Possibly at a low level 4 - No		
6a	**IF YES**, are analyses provided on simulations of the effects using different time-frames for the project if applicable?	1 - No 2 - Partially 3 - Yes		
Note: if in each of the above key criteria under this section the project does not score singularly at least 2 points, do not proceed in further evaluation. Of course, proposals within a sub-group would only be developed if in their estimation scores were of 3 or above.				
Project team and Project Management				
7	To what extent does the team have the relevant expertise, experience, and balance?	1 - Poor or not demonstrated 2 - Sufficient 3 - Very good 4 - Excellent		
8	Contingency plan: To what extent have potential problems/risks been considered and appropriate mitigation proposed?	1 - Poor or not demonstrated 2 - Sufficient but could be improved 3 - Fully or requiring only minor suggestions or not applicable		
Value for Money				
10	Does the project represent good value for money?	1 - No or significant amendments would be needed 2 - Yes but with some minor amendments 3 - Yes		
11	Have sufficient links been made to the wider research community/other organisations/capacity building.	1 - No 2- Some but significant amendments needed 3 - Yes but with some minor additions 4 - Yes or not applicable		

NOTES ON THE SCORING PROCESS

In general, it is NOT the intention to add up the totals for each criterion and arrive at an overall total and then 'winner' among all proposed projects. Some criteria should warrant more weight than others. If ranking is done by individual assessors then systematic variability among assessors will need to be considered. Failure to receive at least a good mark on some key criteria will result in rejection irrespective of scores on other criteria.

An example on how to use the scoring sheet is given by the process used to select projects for funding under the Small Cetaceans Voluntary Fund. The practical evaluation process follows four steps:

(1) each member of the Review Group scores each project (currently there are seven members in the SM Review Group);
(2) the coordinator of the group collates all information for all projects (see Table 1 for a selection of different cases);
(3) a discussion is held on the results of the scoring exercise, particularly the following general rules were applied:
   (a) projects with high mean score (upper band: 25-30), low standard deviation of the overall score (consistency among Reviewers) and means for all criteria over 2.5 and low SD were selected with no **<u>further discussion</u>**

(Project 1 in Table 1);

(b) projects with medium mean score (medium band: 19-24), low standard deviation of the overall score (consistency among Reviewers) and means for all criteria over 2.5 and low SD were selected with **no further discussion** (Project 3 in the table);

(c) projects with medium mean score (medium band: 19-24), low standard deviation of the overall score (consistency among Reviewers) and either a low mean or a high SD for some of the six criteria were **briefly discussed** to double check for consistency among reviewers (Project 2, 4 and 5 in the table);

(d) projects with low mean score (lower band: 18 and below) and high SD of some of the six criteria were **briefly discussed** to double check for consistency among reviewers (Project 6 and 7 in the table); and

(e) the SM Review Group takes the final decision based upon the available funds. Please, note that not all projects with a medium score (good/sufficient) were funded nor the arithmetic ranking reflected the final funding decision (e.g. compare Project 2, 3, 4 and 5). The final decision was taken on the basis of a thorough and fair discussion beyond that of the simple scoring process.

Table 1

Example of the summary of the Small Cetaceans Voluntary Fund scoring process.

	Single evaluator's scoring per criteria and overall (scale 0-5)																			Mean of each criteria						Overall scoring		
Principal Investigator/Project	*Reviewer 1 – Overall score*	1. Scientific Value	2. SM priorities	3. Methods	4. Particip & coop	5. Feasibility	6. PI	*Reviewer 2 - Overall score*	1. Scientific Value	2. SM priorities	3. Methods	4. Particip & coop	5. Feasibility	6. PI	*Reviewer 3 - Overall score*	1. Scientific Value	2. SM priorities	3. Methods	4. Particip & coop	5. Feasibility	6. PI	Scientific value Mean (SD)	SM priority Mean (SD)	Methods Mean (SD)	Partic & coop Mean (SD)	Feasibility Mean (SD)	PI Mean (SD)	TOTAL	MEAN (SD)	SELECTED FOR FUNDING
1. White	*28*	4	5	5	5	5	4	*29*	5	5	5	4	5	5	*26*	4	4	5	5	5	3	4.1 (0.5)	4.4 (0.5)	4.7 (0.5)	3.7 (1.8)	4.6 (0.5)	4.1 (0.5)	180	26 (2.9)	YES
2. Black	*25*	4	4	4	3	5	5	*28*	5	5	4	4	5	5	*16*	3	1	2	2	3	5	3.9 (0.7)	3.9 (1.7)	3.1 (0.9)	2.8 (0.8)	3.7 (1.2)	4.8 (1.2)	153	22 (4.5)	NO
3. Blue	*22*	4	3	3	3	5	4	*27*	4	4	4	5	5	5	*17*	3	3	2	3	2	4	3.6 (0.5)	3.7 (1.0)	3.3 (0.8)	3.0 (1.0)	3.9 (1.1)	4.1 (1.1)	151	22 (3.5)	YES
4. Red	*20*	5	3	5	0	4	3	*20*	3	2	5	0	5	5	*20*	4	3	5	1	3	4	4.0 (0.8)	3.4 (1.3)	4.7 (0.5)	0.4 (0.8)	4.1 (0.7)	4.4 (0.7)	148	21 (1.7)	NO
5. Yellow	*17*	3	3	2	5	2	2	*29*	5	5	4	5	5	5	*14*	3	3	2	2	3	1	3.6 (0.8)	4.1 (0.9)	3.1 (0.9)	4.1 (1.1)	3.3 (1.0)	2.9 (1.0)	148	21 (4.7)	YES
6. Gray	*14*	2	3	2	3	2	2	*19*	3	3	1	5	3	4	*14*	2	0	2	4	2	4	2.4 (0.5)	2.1 (1.1)	1.7 (1.0)	3.3 (1.6)	2.4 (0.8)	3.7 (0.8)	110	16 (2.7)	NO
7. Purple	*15*	3	3	2	2	3	2	*19*	3	3	3	3	4	3	*9*	2	1	1	1	2	2	2.6 (0.5)	2.6 (1.0)	2.1 (0.7)	2.4 (1.0)	3.0 (0.6)	2.6 (0.6)	107	15 (3.7)	NO

5.1.3.2 SIMPLE TECHNICAL GUIDELINES FOR NEW DATABASE PROPOSALS

Proponents of new databases and of major alterations to existing ones must fill a *proforma* (see below). The *proforma* must be reviewed by the relevant SC sub-group, with the technical input from the Secretariat, following the same procedure as for funding proposals (see section 5.1.1). To standardise the creation of databases, repositories, catalogues and applications, guidelines contained at the end of the Proforma should be adhered to.

DATABASE REQUEST PROFORMA

This proforma is to be used for new database requests, and major alterations to existing databases.

Date	Request type	Related sub-committee
New database/alteration *(delete as appropriate)*		

1. DATABASE TITLE

Please provide the title of the database.

2. BRIEF OVERVIEW OF THE DATABASE OR ALTERATION

Give a very brief overview on your proposal and its expected usage within the IWC community. Be succinct and clear as this may be used to summarise your request in a report.

3. IDENTIFIED SCOPE AND USAGE WITHIN THE IWC AND ITS COMMITTEES

Please explain what data the database will hold, and how the database will be used within the IWC and its committees; to what questions of importance to the IWC will this database contribute?

4. PROPOSED DATABASE SCHEMA OR ARCHITECTURE

Please provide an overview of the proposed database schema or architecture. Where possible, please consider providing an entity relationship diagram.

5. INTERACTION WITH OTHER DATABASES

Will the database be required to interact with any other databases or applications?

6. HOW WILL THE DATA BE POPULATED?

Please explain how the data will be populated. Please consider the following: will the data be entered by the public or a select group? Will the data be verified after entry? Will it be web or mobile accessible?

7. OTHER SIMILAR DATABASES

Please list any other databases that capture similar data either within the IWC or externally.

8. TIMETABLE FOR KEY PLANNING ACTIVITIES

Please, add as many rows as necessary.

Activity to be undertaken	**Key person(s)**	**Start (mm/yy)**	**Finish (mm/yy)**

9. PROPOSED COMPLETION DATES

Please, add as many rows as necessary.

Expected outputs	**Completion data (mm/yy)**

10. ASSOCIATED PEOPLE

Please, add as many rows as necessary.

Name	**Affiliation**	**Role within database**

11. DATA OWNERSHIP AND SHARING

Please state your expected data availability arrangements including data ownership and data sharing agreements.

12. TOTAL COSTS

Please provide a breakdown of costs. These may require discussion within the IWC Secretariat.

Type	**Description**	**Cost (GBP)**
Planning costs (e.g. travel/subsistence)		
Development costs (e.g. salaries, contractors, software)		
Ongoing costs (e.g. servers, back-ups, maintenance)		
Equipment costs		
Expected ongoing data co-ordinator costs		
Expected ongoing and one-off data entry costs		

Other costs		
Total		

13. FUNDS AND CONTRIBUTIONS

Please provide details of any existing funds or potential contributions. Please, add as many rows as necessary.

Type	**Description**	**Cost (GBP)**
Existing funds		
Potential contributions		
Total		

14. HAVE YOU READ AND AGREE TO THE IWC DATABASE GUIDELINES?

Please, tick. Guidelines can be found at the end of this proforma*. To ensure you have the latest version please contact the IWC Secretariat.*

Yes	
No	

To standardise the creation of databases, repositories, catalogues and applications, the following **guidelines (version 2017)** should be adhered to:

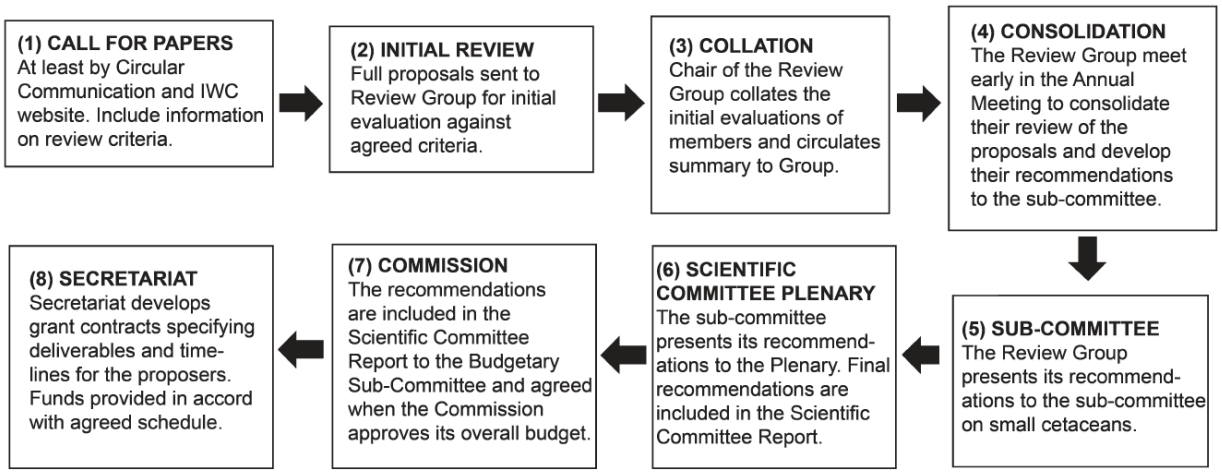
- All new scientific database requests must be submitted to the Scientific Committee for discussion, approval, prioritisation and funding. This must be submitted using a database *proforma* after being discussed by the relevant sub-committee.
- All agreed development work will be overseen by the IWC Secretariat, and the Committee where specific input is needed.
- Where possible, all databases must use open source software.
- Programming languages, database engines and other technologies used must be discussed and agreed with IWC Secretariat to minimise development, infrastructure and maintenance costs.
- All completed source code and database schemas must be provided to and held by the IWC Secretariat.
- All databases will have a 5-year review cycle to ensure code and databases are kept up-to-date and secure.
- Where appropriate, new databases should be developed in a way that will allow expansion and interaction from other databases and applications. This is to be discussed with the IWC Secretariat.
- Where user accounts are required, they should be authenticated by a central IWC authentication server to minimise login credentials for users of multiple databases.

5.2 Voluntary research funds (Financial Regulations Rule C and its Appendixes 1 and 4)

The Scientific Committee also manages the access to three more voluntary funds: the Voluntary Fund for Small Cetaceans Conservation Research (https://iwc.int/sm_fund), the IWC Southern Ocean Research Program (SORP) Fund (https://iwc.int/sorp) and part of the Voluntary Fund for Aboriginal Subsistence Whaling. All funding recommendations follow the same path to obtain the Commission approval; whereas evaluation processes are all tailored to all specific characteristics of each Fund, but they mantin full coherence with the process described in section 5.1 All proposed disbursements need to have the Scientific Committee's recommendation and the Commission's endorsement before they become active.

5.2.1 Voluntary Fund for Small Cetaceans Conservation Research

The evaluation process for project proposals under the Voluntary Fund for Small Cetaceans Conservation Research was finalised in 2010, after a very generous donation to the Fund by Australia (IWC 2011, p. 50). The overall process is described in Fig. XX (IWC 2012, p.282-283).



Outside the tender system, applications by members of the Scientific Committee must be received by the Secretariat at least 60 days prior to the start of the Committee's Annual Meeting. A funding application form must be filled (section 5.2.1.1). A Review Group is appointed by the Committee Chair and the Convenor of the Small Cetacean sub-committee to review proposals in accord with agreed criteria (see section 5.2.1.1). The group will make recommendations for funding to the Small Cetaceans sub-committee. It may suggest improvements to proposals where appropriate and can solicit the assistance of other researchers in the review process if necessary. The recommended projects and budgets are reviewed by the Small Cetacean sub-committee and the full Scientific Committee. Recommended proposals will be added to the Committee's budget as a specific request to the Voluntary Research Fund for Small Cetaceans. The Secretariat will organise contracts for the projects that are approved for funding by the Commission.

Financial Rules concerning this fund are currently under consideration for amendments. This section will be updated after the Commission Biennial (Brazil, September 2018).

5.2.1.1 FUNDING PROFORMA AND CRITERIA FOR SMALL CETACEAN CONSERVATION FUND RESEARCH PROPOSAL REQUESTS

1. TITLE OF PROJECT
Do not exceed 30 words.

2. TYPE OF PROJECT
Please tick.

Cooperative research only	
Cooperative research & Capacity building	
Cooperative research & Public awareness	
Cooperative research, capacity building and public awareness	

Note: research proposals need to include at least two partners from different countries relevant to the study region and to the needed analysis (when the data collection includes more than two countries, the participation of at least one partner per country is highly recommended).

3. CONTACT DETAILS OF NAMED INVESTIGATORS
Principal Investigator first. Add as many boxes per investigator, as needed. Note that CV's (maximum 1 page per investigator) should be included as an appendix to the application.

Name	
Address	
Email	
Nationality	
Domicile	

Name	
Address	
Email	
Nationality	
Domicile	

4. KEY STAKEHOLDERS

Institution name	
Address	
Email	
Nationality	
Domicile	
Contribution/ Involvement in project:	

5. DESCRIPTION OF PROJECT
Do not exceed 2500 words.

(1) Background, rationale, relevance to the priorities identified by the Sub-committee on Small Cetaceans:
Provide a clear explanation of the background and rationale for the proposal and its relevance to to the priorities identified by the IWC's Scientific Committee through its Sub-committee on Small Cetaceans. Clearly identify the most relevant and recent Scientific Committee recommendations.
(2) Specific objectives and originality of the project/ToR and deliverables/outcomes for workshops and meetings:

Provide the specific objectives and the expected deliverables. In the case of workshops and meetings, include the Terms of Reference (ToR) and expected outcomes.
(3) Methodological approach/work plan/administrative details:
Specify the methods to be applied (novel methods require more explanation than standard ones) and the broad work plan – the detailed timetable appears under Item 6 below. In the case of workshops and meetings, include the broad work plan including any pre-requisites for the workshop/meeting to take place (apart from funding, e.g. completed analyses, papers etc.) and administrative details (e.g. location, dates, number of participants).
(4) Suggestions for outreach:
Please, note that successful proponents will be requested to produce ad hoc material that will be used by the IWC Secretariat for dissemination and outreach.

6. SUMMARY OF SCHEDULE OF WORK

Add as many rows as necessary.

Summary of the Project work plan			
Activity to be undertaken	Responsibility	Start date (mm/yy)	Finish date (mm/yy)

Add as many rows as necessary.

Summary of the Project outputs	
Expected outputs	Completion date (mm/yy)

(a) Expected completion of final report to IWC

Note that an annual progress report is required.

(b) Publication plan for the results of their research.

Applicants are encouraged to consider the IWC's journal (JCRM).

(c) Will you agree to the use of the results of your study, if requested by the IWC Scientific Committee under its Data Availability Agreement that protects first publication rights of the researchers?

Whilst this is not a pre-requisite of a successful application, it will be taken into account). Note that for fully funded IWC research the data shall become publicly available after a mutually agreed period.

Yes	
No	

7. BUDGET REQUEST

Note that the budget has to be in UK currency [£, GBP]. If submitting a multiannual project, present annual budgets. Breakdown into: (1) salaries/wages (include name/position of each individual and breakdown of time and duties i; (2) travel/subsistence expenses (breakdown by person and justification) unless for IPs for workshops where a total estimate based on an average for the total number of IPs is acceptable; (3) services (e.g. aircraft/vessel time, consultancy fees, ARGOS fees, etc.; (4) reusable capital equipment (e.g. reusable equipment such as a hydrophone, cameras, etc. Note that this equipment will have to be registered at the IWC Secretariat and will remain property of the IWC at the end of the project), (5) expendable capital equipment (e.g. consumables, tags, stationery), (6) shipping costs, (7) insurance costs, (8) in kind co- funding (specify whether other funding is available for personnel/name, equipment, venues, etc.). Note that 'Overheads' are not admissible. Add as many rows as you need to the table below.

Type	**Detailed description**	**Cost in GB pounds**
(1) Salaries (by person)		
(2) Travel/subsistence (by person or est. total for IPs)		
(3) Services (by item)		
(4) Reusable equipment		
(5) Consumables		

(6) Shipping (by item)		
(7) Insurance (by item)		
(8) Co-funding		
(9) Other		
Total		

8. OTHER GRANTS HELD FOR THIS OR OTHER RESEARCH, OBTAINED OR SOUGHT WITHIN THE PREVIOUS THREE YEARS

Give amount, title of project and completion date.

9. PERMITS

Please tick.

Do you have the necessary permits to carry out the field work and have animal welfare issues been appropriately considered?	
Please, provide any further information in the space below on how the use of animals in the proposed research has been appraised i.e. in light of internationally recognised practices:	
Do you have the appropriate permits (e.g. CITES) for the import/export of any samples?	

If 'Yes' please provide further details and enclose copies where appropriate:

10. TWO REFEREES WHO COULD BE APPROACHED

Name	
Address	
Email	

Name	
Address	
Email	

11. APPENDIX

Short CV's for each named investigator (maximum 1 page each, focussed on relevance to project.

SMALL CETACEAN CONSERVATION RESEARCH PROPOSALS - REVIEW CRITERIA

These criteria are used by all assessors to evaluate each project.

	Criteria	**Weighting**	**Score**	**Comments**
1	Is the intrinsic scientific value of the project of a high standard?	0 Not demonstrated 1 Low scientific value 2 Useful/basic scientific value 3 Good scientific value 4 Very good scientific value 5 Excellent/innovative scientific value		
2	How well will the scientific outcomes of the project address the Small Cetaceans subcommittee priority areas?	0 Not addressed 1 Poorly addressed 2 Reasonably addressed 3 Well addressed 4 Very well addressed 5 Excellently addressed		
3	Does the methodology outlined effectively and efficiently address the research questions in the proposal?	0 Not demonstrated 1 Poor methodology 2 Reasonable methodology 3 Good methodology 4 Very good methodology 5 Excellent methodology **Yes, after incorporation of reviewers' suggestions*		

4	Does the project involve good participation and engagement of regional participants?	0 Not demonstrated 1 Poor engagement proposed 2 Reasonable engagement proposed 3 Good engagement proposed 4 Very good engagement proposed 5 Excellent engagement proposed		
5	Is the research proposed feasible, well organised and timeline achievable?	0 Not demonstrated 1 Feasibility, organisation and timeline unrealistic 2 Feasibility, organisation and timeline not properly addressed 3 Feasibility, organisation and timeline sound 4 Feasibility, organisation and timeline demonstrated well 5 Feasibility, organisation and timeline very well demonstrated **Yes, after incorporation of reviewers' suggestions*		
6	Do you consider the principal investigator and research team have demonstrated that they are capable of conducting the research and publishing the results?	0 Not demonstrated 1 Poor record 2 Reasonable record 3 Good record 4 Very good record 5 The Principal Investigator and research team have an excellent research and publication record relevant to the proposed work		

5.2.1.2 LETTER TO SUCCESSFUL PROPONENTS

Heading: Re: [insert **title of project**]

Dear [insert name of **PI**]

This letter is to confirm that your proposal for funds from the IWC Voluntary Fund for Small Cetaceans has been accepted. Congratulations!

We are now working on the drafting of a formal grant agreement. This may be an iterative process if the IWC's appointed liaison scientist has any questions or clarifications for you but we hope that the development of the formal grant will be completed by the end of [**insert month**].

Your liaising scientist will be [**insert name**]. The liaising scientist will act as: your first point of IWC contact with respect to any questions about the final grant agreement; the recipient of information on progress; or any other questions or comments you may have during the lifetime of the project.

Congratulations again and I will be in touch before the end of August about the grant agreement.

[**insert name**]

Head of Science

5.2.1.2 LETTER TO UNSUCCESSFUL PROPONENTS

Dear [**insert name**]

Thank you very much for your interest in the IWC's Small Cetaceans Voluntary Fund and taking the time to submit a proposal for funding.

We received a total of [**insert total number**] proposals submitted for projects based in [**insert total number**] continents, all of which were of a very high quality. Unfortunately, we did not have sufficient money available to fund all of the projects. Choosing the projects to be funded was very difficult and the IWC Scientific Committee, after receiving recommendations from the specially appointed Review Group, finally chose nine projects for funding. I am very sorry to say that unfortunately your project was not one of them.

We are trying to attract more donations to the fund and we hope to be in a position to put out a further call for proposals in two years time. Details will be posted on the IWC's website in due course.

Once again thank you for your interest and we wish you well with your work.

Yours sincerely

[**insert name**]

Head of Science

5.2.2 IWC Southern Ocean Research Partnership Research Fund

Financial Rules concerning this fund are currently under consideration for amendments. This section will be updated after the Commission Biennial (Brazil, September 2018).

In 2016 and 2017 the IWC-SORP Scientific Steering Committee updated the IWC-SORP's 'Funding mechanism for allocation of funds from the IWC-SORP Research Fund' (IWC 2011) to align with IWC Scientific Committee procedures for reviewing project proposals and adjusting Assessment Panel and Review criteria (IWC 2018, pp. 422-423).

5.2.2.1 FUNDING MECHANISM FOR ALLOCATION OF FUNDS FROM THE WC-SORP RESEARCH FUND

The Southern Ocean Research Partnership (IWC-SORP) was proposed to the International Whaling Commission (IWC) in 2008 with the aim of developing a multi-lateral, non-lethal scientific research programme operating in the Southern Ocean that would improve the coordinated and cooperative delivery of science to the IWC. Currently, there are eleven member countries in the Partnership: Argentina, Australia, Brazil, Chile, France, Germany, Italy, New Zealand, Norway, South Africa and the United States. IWC-SORP is an open Partnership and we warmly welcome new members.

The Southern Ocean Research Partnership ethos is one of open collaboration, communication and data sharing.

The process for the allocation of funds from the IWC- SORP Research Fund is given below. The background to IWC-SORP, its objectives and a description of any funded projects are available on the IWC website (https://iwc.int/sorp).

The IWC-SORP Scientific Steering Committee (IWC-SORP SSC) is an intersessional Working Group of the IWC Scientific Committee. It is composed of a representative, with technical expertise, nominated by each member nation of the Partnership, as well as the Convenor of the Southern Hemisphere sub-committee, the Chair of the Scientific Committee, the IWC Head of Science and the IWC-SORP Secretariat. IWC-SORP SSC has agreed to extend membership to the CCAMLR observer to IWC Scientific Committee. At the discretion of the IWC-SORP SSC, additional representatives from Partnership members, as well as interested parties are welcome to attend and participate in meetings of this Committee.

5.2.2.1.1 REVIEW BY THE IWC-SORP ASSESSMENT PANEL

All project descriptions and applications for funding will initially be sent to the IWC-SORP Assessment Panel (SORP-AP) in accordance with the IWC-SORP *proforma* (section 5.2.2.1.6). The composition of the group is presented in Appendix 1.

The SORP-AP will review the proposals following the same assessment process adopted by the Scientific Committee in similar circumstances e.g. the Small Cetaceans Voluntary Fund. This review will include a determination of how well the proposals align with IWC-SORP objectives. In addition, the SORP-AP will consider any conditions associated with voluntary contributions as specified by donors. The SORP-AP may suggest improvements to proposals where they believe this is appropriate and may solicit the assistance of other researchers in the review process.

The IWC-SORP Assessment Panel comprises the following Scientific Committee members:

(a) Chair of the Scientific Committee (leading the Assessment process);
(b) Vice-Chair of the Scientific Committee;
(c) IWC Head of Science (IWC Secretariat);
(d) current Convenor of the SH sub-committee;
(e) two to three ex-Convenors of the SH sub-committee;
(f) a representative from the IWC-SORP Secretariat;
(g) Chair and Vice-Chair of the IWC-SORP Scientific Steering Committee; and
(h) additional members deemed necessary by the SC Chair to facilitate the assessment of proposals. These assessors will be drawn from the Scientific Committee.

5.2.2.1.2 REVIEW BY THE IWC SCIENTIFIC COMMITTEE

Upon receipt of a final proposal(s) (revised if necessary), the SSC will provide a short review of each proposal to the IWC Scientific Committee for consideration at its next Annual Meeting, including comments on how well the proposal aligns with IWC- SORP objectives2 and any other criteria specified in the Call for Proposals. A summary of the final evaluations made by the SSC and the budgets associated with each proposal (including recommendations as to whether funding should be fully, partially or not supported) will also be provided to the IWC Scientific Committee.

Following consideration (and potential revision) by the Scientific Committee, approved requests will be added to the Scientific Committee budget as a specific request to the IWC-SORP Research Fund.

This final budget request will then form part of the Report of the Scientific Committee and will be presented to the Commission for approval.

5.2.2.1.3 REVIEW BY THE COMMISSION

The Scientific Committee Report and associated budget will be considered by the Commission and the IWC-SORP funding requests will be reviewed during normal business.

5.2.2.1.4 IWC SECRETARIAT TO DEVELOP FUNDING AGREEMENTS WITH APPROVED PROJECTS

Based on the proposals approved by the Commission, the Secretariat will organise contracts with the successful projects.

5.2.2.1.5 DISCRETIONARY ALLOCATION OF FUNDS

At IWC/62 in 2010, the Commission confirmed that the SSC is able to allocate a discretionary amount of not more than £15,000 per budget period in order to ensure the smooth running of approved programmes. Any such requests will be discussed and agreed by the SSC in advance of an allocation being made.

All discretionary allocations will be consistent with the objectives of IWC-SORP and the IWC as endorsed by the Scientific Committee and Commission. All allocations will be reported by the SSC Chair, via the IWC-SORP Annual Report, to the IWC Scientific Committee at its next meeting.

5.2.2.1.6 NEW ASSESSMENT CRITERIA

The text and criteria are explained below; these criteria will be included in guidelines to applicants that will be published when the new Call for Proposals is announced. Both the criteria and the text will be included in a wider document circulated to the Assessment Panel to help them complete an assessment of any proposals received, with which they have no Conflict of Interest.

Applications will be assessed and scored on scientific merit and relevance for the Scientific Committee priorities (a maximum of 35 points). Proposals will be ranked based on these scores and a threshold score for funding will be identified based on quality and available funds. Generally, only projects that score 3 or above for Criterion 1, will be considered for funding.

The applications are assessed for scientific merit against seven criteria, each of which is scored between 0 - 5 as shown in Table 5.2.2.1.

Table 5.2.2.1: Evaluation criteria and scoring.

Criteria	**Weighting** *[Each criterion is scored to a maximum of 5 out of 35. Applicants must score 3 or above for Criterion 1 to be considered for funding.]*
1. How well will the scientific outcomes of the project contribute to IWC-SORP and IWC/SC research priorities for Southern Ocean cetaceans?	• No contribution (0) • Poor contribution (1) • Reasonable contribution (2) • Good contribution (3) • Very good contribution (4) • Excellent contribution (5)
2. Will the project deliver novel studies or analyses facilitated by broad collaboration within the IWC-SORP Partnership and the IWC/SC?	• Existing, stand-alone project with no apparent need for broad collaboration (0) • Collaboration within the IWC/SC but less apparent need for collaboration within IWC-SORP (1-2) • Collaboration apparent between some IWC-SORP Partnership and IWC/SC members (3-4) • Highly collaborative project including many IWC-SORP Partnership and IWC/SC members (5)
3. Does the project have a wide geographic scope and/or applicability across multiple regions?	• Project has little applicability to Southern Ocean research (0) • Project focusses on a single, relatively restricted geographic region and has little applicability elsewhere (1) • Project focusses on two or more regions but has little applicability elsewhere (2) • Project captures two or more regions and is applicable across a wider geographic area (3) • Project captures multiple regions throughout the Southern Ocean and/or has demonstrated circumpolar relevance (4-5)
4. Does the proposal demonstrate that the proposed methodology and data analyses are suitable to deliver the stated objectives?	• Not demonstrated (0) • Poor methodology/data analyses (1) • Reasonable methodology/data analyses (2) • Good methodology/data analyses (3) • Very good methodology/data analyses (4) • Excellent methodology/data analyses (5)
5. Have the applicants demonstrated co- investment or the potential for the project to leverage co-investment/vessel time etc. if funded?	• Not demonstrated (0) • Little co-investment demonstrated (1) • Partial co-investment demonstrated (2) • Partial co-investment and potential for leverage (3) • Full co-investment but no potential for leverage (4) • Full co-investment1 demonstrated and potential for leverage (5)
6. Is the research proposed feasible, well budgeted, well organised and with a timeline allowing for the achievement of all objectives?	• Not demonstrated (0) • Feasibility, budget, organisation and timeline unrealistic (1) • Feasibility, budget, organisation and timeline not properly addressed (2) • Feasibility, budget, organisation and timeline may not allow all main objectives to be achieved (3) • Feasibility, budget, organisation and timeline indicate that most main objectives are likely to be achieved (4) • Feasibility, budget, organisation and timeline very likely to result in all objectives being achieved (5)
7. Do you consider the Chief Investigator and research team to have appropriate track record/s, including publishing in peer reviewed literature and/or delivery into the policy and management arena? *Please consider early career research scientists relative to their stage of career. Scores accommodate consideration of career maturity.*	• Not demonstrated (0) • Poor record (1) • Reasonable record (2) • Good record (3) • Very good record (4) • The CI and research team have excellent track record/s including publishing, management delivery and grant performance (5)
Overall total out of 35	

5.2.2.1.7 Assessing meeting/workshop/event proposals

If the application concerns a meeting, workshop or an event, consider whether the applicants have demonstrated the importance of the activity in facilitating the scientific work/ progress of IWC/SC and IWC-SORP projects and priorities.

5.2.2.1.8 Assessing proposals for activities that provide ongoing contributions/support of projects

If the application concerns the support of ongoing efforts that contribute to existing projects but are not intrinsically innovative, collaborative or candidates for co-investment[51], inter alia matching of photographic-identifications or database development/management, consideration should be given to the overall importance of the activity in supporting and facilitating the scientific work/progress of IWC/SC and IWC-SORP projects and priorities.

5.2.2.1.9 Assessing proposals for a new IWC-SORP Theme

If applicants propose a new IWC-SORP Theme, they need to show that:

(1) the project will make a substantial contribution to IWC- SORP and IWC/SC priorities;
(2) the project and PIs will strongly benefit from the multi- national collaborations that result from being part of IWC-SORP;

[51] Full co-investment is defined as external contributions to the proposed project that approximately equal or exceed that requested from the IWC- SORP Research Fund. Partial co-investment is defined as external contributions that are cumulatively less than that requested. Co-investments can include both financial and/or in-kind support, e.g. scientific equipment, personnel, vessel time/berths.

(3) the project will have sufficient support and longevity; and
(4) the project will have sufficient level of co-investment or potential for leveraging additional support/vessel time, etc., demonstrated.

5.2.2.1.10 REFERENCE

International Whaling Commission. 2017. Report of the Scientific Committee. Annex W. Update to the Funding Mechanism for Allocation of Funds from the IWC-SORP Research Fund. *J. Cetacean Res. Manage. (Suppl.)* 18: 455.

International Whaling Commission. 2011. Report of the Scientific Committee. Annex R. Proposed Funding Mechanism for Allocation of IWC SORP Funds. *J. Cetacean Res. Manage. (Suppl.)* 12:353-55.

5.2.3. Voluntary Fund for Aboriginal Subsistence Whaling

[DONOVAN]

6.2 Unsolicited research projects and activities (SC RoP G.2)

Note: this section may be removed

CHAPTER 6

GUIDELINES FOR WRITING AND EDITING IWC REPORTS

[UNDER CONSTRUCTION; RESPONSIBILITY OF **STELLA**]

- SOME WORD ON PUBLICATIONS AND THE SECRETARIAT ROLE
- Role of chairs

Rapporteurs play a very important role in the Committee's report writing. This chapter contains a set of guidelines and links to official templates for reports to assist their work.

6.1 Style of sub-group agendas

The Agenda of subgroups is drafted according to the following typical outline:

SUB-GROUP AGENDA

1. INTRODUCTORY ITEMS

1.1 Introductory remarks

1.2 Election of Chair

1.3 Appointment of rapporteurs

1.4 Adoption of Agenda

1.5 Documents available (…*list all documents*…)

[… All necessary priority topics …]

#. Progress on previous recommendations

#. WORK PLAN

#. BUDGET REQUESTS FOR 20##-20## [This item is present only in years when the Commission meet]

#. ADOPTION OF REPORT

Since 2016, the Committee's advice, agreements, recommendations and conclusions are written according to a standard format, which helps in highlighting and identifying them, the primary intended recipients (of course it is recognised that in a general sense, the whole report provides advice to the Commission) and the context in which they generated. See section 6.2.1.1 for full details.

6.2 Style of sub-group reports

Sub-group reports need to be:

(1) concise and comprehensible both to people who attended the meeting and people who did not; and

(2) as complete as possible (including references and artwork) by the end of the meeting as the Scientific Committee Chair and HoS will have only two weeks after close of meeting (see Commission Rule of Procedure M.5) to finalise the full Committee report (including sub-group reports as Annexes) for distribution to Commissioners and Contracting Governments. This will have the additional benefit of allowing the published version (as published in the *Journal of Cetacean Research and Management*) to be completed more quickly.

6.2.1 General style of sub-group reports

A template file with heading styles is provided to all rapporteurs by the Secretariat (or is downloadable here).

The sub-group agenda must be used to form the outline of the report, but additional sub-items can be inserted if this improves the clarity of the report.

The text of the report should be made of well-documented summaries of discussions rather than verbatim or quasi-verbatim records. As a general approach, rapporteurs need to write a good, logically structured 'essay' on the topic of the agenda item, based on the discussions, irrespective of the order in which comments were made.

Individuals' names should be avoided, unless someone specifies that they would like a particular statement attributed to them or there is no general agreement on a given issue.

For papers presented at each given meeting, paper numbers should be used instead of author names (e.g. SC/66a/BRG2), and these papers do not need to be added to the reference list. When referencing papers from previous IWC meetings author names/date should be used and the full reference for these added to the reference list. Intersessional IWC working groups and workshops need to be

referenced with name/date/place of the meeting at the first reference in the text, together with the SC/66a/Rep number in brackets. Thereafter only the SC/66a/Rep number should be used. There is no need for these reports to be added to the reference list.

Sub-groups should be referred to in the past tense, including their recommendations and agreements. Bold should be used when the sub-committee has **agreed** on, or **recommended** something.

Authors should provide brief summaries of their papers, which will be edited for consistency and style, and to keep a fair balance. It must be clear where an author's summary ends and the sub-group discussion begins. For complex or controversial discussions, the relevant parts of the draft report should be shown to the relevant participants before being inserted in the draft report.

6.2.1.1 GUIDANCE ON LANGUAGE IN RECOMMENDATIONS OF THE SCIENTIFIC COMMITTEE

Important action items, such as agreements and recommendations, should be highlighted by placing them in boxes. Recommendations should be structured as follow:

(1) Must be deemed high priority, be focussed and be standalone (i.e. include short explanation as to why it is needed as well as what is needed). NB: Workshops should follow these guidelines in their reports and their 'recommendations' if deemed high priority by the SC must be brought forward into the main SC report (where not deemed high priority it is possible to 'encourage').
(2) Where appropriate (i.e. linked or sequential actions), should have the main introductory chapeau followed by a series of numbered 'actions' (NB: as appropriate sub-items may have different targets/categories).
(3) If one or more actions lead to a budget item, cross-reference to proposed budget.
(4) Must be identified by a unique code e.g.:
    i. SC67aR1; SC67aE1; SC67aC1
    ii. If sub-actions SC67aR1.1 etc
(5) Specify the target(s).
(6) Provide time-frame where possible.

Categories for the blue boxes in the SC report are the following:

Recommends [and may be in conjunction with reiterates]	*Specific* important actions aimed at targets e.g. • Commission or its sub-groups (e.g. CC, AWS, WKM&WI) • Contracting Governments within a region or 'range states' (should name them unless 'all') • Secretariat
Draws attention to/advises	*General* considerations (e.g. of concern, research areas of importance) or *specific* advice (e.g. on SC conclusions) should identify targets e.g. • Commission or its sub-groups (e.g. CC, AWS, WKM&WI) • Contracting Governments within a region or 'range states' (should name them unless 'all') • IGOs • General scientific community
Encourages	Work that it would be good to be undertaken but is not high enough priority to be considered a recommendation (primarily SC internal use)
Agrees	*Internal* actions for the Scientific Committee (e.g. Workplan)
Concludes	To be used to highlight that a major piece of work has been completed e.g. *Implementation Review, in-depth assessment*; topic

The first row of the box provides the code of the primary intended recipients/target ('***Attention:*** *SC, G* [targets' code] …'). Make sure you select at least one of the following: SC=recommendation internal to the Scientific Committee, G=general scientific recommendation; C-A=advice to the Commission; C-R=recommendation to the Commission; CC=recommendation relevant to the Conservation Committee; AWS= recommendation relevant to the Commission's Aboriginal Subsistence Whaling sub-committee; CG-A=advice to a contracting government or governments; CG-R=recommendations to a contracting government or governments; G-R=recommendations to a non-contracting government or governments; and S=recommendation relevant to the Secretariat.

After this row, the box includes text providing the context in which the advice, agreement, recommendation or conclusion arose, followed by the actual advice, agreement, recommendation or conclusion.

Recommendations or advice to CG(s), non-members or IGOs should be appropriately drafted following one of these styles:

- Options: '**Recommends** that the Commission **requests** (or *vice-versa*!) Country 'X' or Countries 'X, Y and Z'
- Options: **Recommends** that the Secretariat **requests** IGO X

Note that the Commission may then instruct the Secretariat to write.

See the following examples:

Attention: [intended audience:]*SC, C-A*
[context:] *The Committee has completed the* Implementation Review *of North Atlantic common minke whales.* [agreement/advice:] *Based on the results of the* Implementation Simulation Trials, *the Committee agrees that variants 1, 3, 4 and 5 (see Item 6.1.2) are acceptable in terms of conservation performance. Of those, variant 5 achieves the best performance in terms of catch.*

Attention: [intended audience:] *G, CG-R*
[context:] *The Committee welcomes the results of the long-term studies of gray whales in the wintering areas in the lagoons of Mexico and the northbound shore-based migration counts.* [recommendation/advice:] *It reiterates the importance of these long-term studies and recommends that they continue, particularly for analyses of abundance and calf production in conjunction with environmental factors. Such analyses can provide general as well as specific insights on the population dynamics of whales in response to environmental factors.*

Attention: [intended audience:] *G, CC*
[context and recommendation/advice:] *The Committee recommends that the work on dynamics of collisions between large ships and large whales, such as that in SC/67a/HIM16 continue, noting its potential to provide advice on mitigation measures. It also encourages the author to discuss with relevant stranding coordinators what type of data could be collected to help improve the models.*

6.2.1.2 WORKING PAPERS/APPENDICES

Working papers do not exist in an official form and disappear after the meeting (i.e. reports and appendices must not refer to 'WP2' etc). If the information they contain is important, see section 5.1 on how to handle them.

Appendixes should be essential for inclusion and, if so, should indicate whether it needs to appear in the published version of the report or can be placed on the website with an appropriate footnote in the published report.

6.2.1.3 ARTWORK

All tables and figures should contain a legend and be clearly referenced in the text.

Artwork should be compatible with our style and format.

6.2.1.4 REFERENCE LISTS

References should be given in full, i.e. author and year - there should be no instances of '(REF)' within the text. For IWC publications include page numbers e.g. IWC (2003, p.75) in the text and put the full reference in the reference list. Reference lists must be checked.

6.2.2 Chair's overview of sub-group work

Following a Commission request, the Committee is constantly trying to improve its communication strategy. At the past two Commission's meetings the Scientific Committee Chair, Vice-Chair and Head of Science prepared a new document titled "Short overview of the work of the Scientific Committee at its 2015 and 2016 Annual Meetings" (see for example document IWC/66/17). These documents were greatly appreciated by Contracting Governments.

CHAPTER 7: GUIDELINES ON LOGISTIC ARRANGEMENTS FOR INVITED PARTICIPANTS' ATTENDANCE

7.1. Guidelines on logistic arrangements for Invited Participants' attendance at Scientific Committee meetings

To further its work the Scientific Committee relies on external expert advice on specific elements of its workplan. These scientists and experts are identified by the Convenors (see section 4.1.1) as providing necessary expertise for them to complete their work and for which funding will be provided by the IWC.

The timetable and process for Invited Participants is summarised below (SC RoP A.6):

(1) At least **4 months prior a meeting** Convenors suggest IPs based on draft agenda/workplan.
(2) **3.5 months prior a meeting the** Chair, in consultation with Convenors and Secretariat, develop list of IPs and invitation letters sent (section 8.1.1; 'expression of interest') stating that funding may be available. If prospective IPs cannot obtain their own funding, the Secretariat will prepare a costed list within two weeks. Governments are forwarded this list to ascertain whether they can offer funding for some of the listed scientists.
(3) **3 months prior** a meeting the Secretariat supplies the Chair with a consolidated list of potential IPs and costs, for decisions on funding, based on priorities and consultations with Convenors and Secretariat.
(4) **2 months prior a meeting**, IPs informed of outcome of funding requests.

Potential Invited Participants must respond to the 'expression of interest' letter **within 15 days**, otherwise their priority for funding will automatically be "low". This deadline can be relaxed by the Chair, in consultation with Convenors and Secretariat, in exceptional circumstances (e.g. people known to be out of reach for professional and personal reasons, needing more time to reply, etc).

Please, note that participants to IWC Meetings are responsible for their own travel insurance. All flights will be booked in economy class unless a written authorisation is provided giving reasons for which a different class is required. If the participant requires to book the flight themselves, as their travel incorporates other meetings around the IWC Meeting, they must ask for permission in advance and a cap cost will be provided by the Secretariat for the participant to work from. Should funded participants miss or wish to change their flights they will be required to re-organise this themselves at their own cost.

7.1.1 Template of invitation letter for "highest priority" Invited Participants

Here below you find the templates of the letter of invitation for "highest priority" Invited Participants (e.g. Convenors, co-convenors and key experts).

> **"INVITATION TO ATTEND THE 2018 ANNUAL MEETING OF THE IWC SCIENTIFIC COMMITTEE (SC/67b), BLED, SLOVENIA, 24 APRIL-06 MAY 2018**
>
> The next Annual Meeting of the IWC Scientific Committee (SC) will take place from …. DATES ….., at the …HOTEL NAME…, …HOTEL LOCATION…. The period …DATES… will be largely dedicated to morning Plenary sessions, some *ad hoc* meetings (afternoon) and reading papers. Sub-committees will meet from …DATES…. The final three days …DATES… will be used for Plenary business.
>
> Provision for the following pre-meetings has been made during the period …DATES… at the same venue:
>
> - TITLE Pre-meeting, …DATES…
> - TITLE Pre-meeting, …DATES…
>
> On behalf of NAME, the Chair of the Scientific Committee, I am writing to extend our invitation to you to attend the Scientific Committee Meeting as an Invited Participant. We shall particularly value your contributions in the following sub-committee(s):
>
> SUB-GROUPS NAMES
>
> Invited Participants, as non-voting contributors, will receive all Committee documents and papers, may present papers of their own, participate on sub-committees and participate fully in all discussions pertaining to their area of expertise. However, it should be noted that discussions of Scientific Committee procedures and policies (which will be identified by the Chair) are limited to Committee members nominated by member governments. Non-voting contributors must also use their discretion with regard to the formulation of potentially controversial recommendations to the Commission.
>
> We are pleased to inform you that the IWC has funding available to cover your attendance at the meeting for the period …DATES…. We would base your accommodation on arriving the day before the SC starts (DATE) and depart on the afternoon/evening of DATE (flight times permitting). Please return the attached form **as soon as possible** to secretariat@IWC.int to indicate if you wish to accept the invitation. Travel bookings will be made by the IWC so please identify your nearest airport on the attached form. Hotel bookings will also be made by the IWC.
>
> I look forward to your early response.
>
> Yours sincerely,
>
> NAME
>
> Executive Secretary"

7.1.1.1 REPLY FORM TO THE INVITATION LETTER

Invited Participants are required to respond to the invitation within 15 days to confirm or otherwise their interest.

IWC Scientific Committee Meeting

… DATES …

Please complete by including appropriate information and by deleting inappropriate cells and e-mail your reply to: secretariat@IWC.int

Name (as written on the Passport):		
I am able	I am not able	**to accept your invitation**
Travel details and expenses if appropriate:		
Nearest Airport:		
Estimated incidental costs*:-		
	Local travel	*Insert amount here*
	Airport taxes	*Insert amount here*
	Passport/visa costs etc.	*Insert amount here*

**Any differences between estimated and actual costs will be adjusted after the meeting. Please retain receipts, ticket stubs etc for provision at that time.)*

Please note:

(a) Participants to this meeting are responsible for their own travel insurance.
(b) All flights will be booked by the Secretariat. Should funded participants miss or wish to change their flights they will be required to re-organise this themselves at their own cost.
(c) The participant will be asked to confirm the booking details before the ticket is issued. Any changes in name after the ticket is issued will involve charges which the participant will be responsible for.

7.1.2 Template of invitation letter for "High" and "Medium priority" Invited Participants

The template of the letter of invitation for "High" and "Medium priority" Invited Participants is identical to the letter in section 8.1.2 except its final paragraph, which reads as follow:

> "Please return the attached form **no later than DATE** [15 days after] secretariat@IWC.int to indicate if you wish to accept the invitation and, if so, whether you require funding by the IWC. If the form is not received by this date your priority for funding will automatically be "low". The Commission has limited funds available for the support of Invited Participants, and you are therefore encouraged to try to find your own funding. If you are unable to find an alternative source of funding **we may be able** to fully cover your participation. Travel bookings will be made by the IWC so please identify your nearest airport on the attached form. We will base travel dates on arriving …DATES… and departing …DATES… (depending on flight times). Hotel bookings will also be made by the IWC."

7.2 IWC Policy for Paying Travel for Invited Participants

Since March 2018, the IWC Secretariat has prepared guidelines on the IWC policy for paying travel for Invited Participants, including those attending intersessional meetings, workshops and the Annual meeting of the Scientific Committee. These guidelines are in line with the IWC Secretariat Handbook.

7.2.1 Authority for travel

All travel arrangements must be authorised in advance by the IWC Executive Secretary. Invited Participants (IPs) are individually responsible for ensuring that they have the proper authorisation before commencing travel. The authorisation granted by the IWC Executive Secretary is conditioned on the IP following the travel guidelines.

7.2.2 Travel expenses

The Commission will pay or reimburse travel expenses for the following items:

- transportation and transit expenses (i.e. carrier fare and airport transfers);
- subsistence allowance to offset the additional cost of meals while travelling (except on long haul flights or other means of travel where food is provided);
- other additional expenses necessarily incurred during travel.

Invited Participants must exercise the same care in incurring expenses that a prudent person would exercise if travelling on personal business.

7.2.3 Route, mode and standard of transportation

Official travel will be by the most direct and economical route and mode of transportation as far as is practicable. This is unless it is established to the satisfaction of the Executive Secretary that the use of an alternative route or mode of transportation is in the best interests of the Commission.

Travel subsistence or other entitlements including travel time will be limited to the amount allowable for a journey by the approved route, mode and standard. Invited Participants who wish to make other arrangements for personal convenience must obtain permission from the IWC Executive Secretary to do so in advance and pay all additional costs.

Within the UK the mode of travel normally approved will be the most economical in terms of cost and time. Outside the UK travel will normally be economy class air, or its equivalent, by recognised public transport.

7.2.4 Purchase of tickets

Unless Invited Participants are specifically authorised in advance to make other arrangements, all flight tickets for transportation involving official travel of IPs will be purchased by the Commission in advance of the actual travel. For local transportation, bus and/or rail ticket receipts will be required. Any tickets purchased without following these procedures will not be reimbursed by the IWC.

7.2.5 Travel subsistence allowance

Invited Participants authorised to travel at IWC expense will receive an appropriate daily subsistence allowance unless meals are provided, e.g. during air travel or where included in accommodation or course/conference fees. Subsistence allowance is paid in arrears after return from travel. Receipts are not required for meals (with the exception of occasions where some but not all meals are provided, as noted below), nor for any claims below £5.

For travel within the United Kingdom this allowance will be set at the same rate and paid under the same conditions as the UK Government's HMRC subsistence expense allowances at https://www.gov.uk/hmrc- internal-manuals/employment-income-manual/eim05231.

For travel outside of the United Kingdom the rate will normally be determined from a survey of local prices obtained from site visits or through a web search, with the intention of establishing a level of allowance equivalent to the rates used in the UK as set through the HMRC. Consideration may also be given to the rates set by the United Nations and used by its organisations. As such, these rates may modify over time; IPs will be notified at least two weeks in advance of the amount of subsistence allowance that will be provided once the travel has been completed and the receipts and other information have been provided to the Secretariat.

On occasions where meals are regularly provided, e.g. at meetings or during air travel, IPs should claim actual meal expenses (with supporting receipts) rather than a blanket day rate.

7.2.6 Computation of the travel subsistence allowance

Subsistence allowances will be paid at the rates and under the conditions prescribed for each period of 24 hours during which an Invited Participants official travel status.

7.2.7 Visa costs

The Commission will pay the costs of any relevant visa or visa waiver charges where s/he is required to undertake official IWC travel overseas.

7.2.8 Reimbursement of expenses

The Secretariat will reimburse expenses wholly and properly incurred in accordance with this policy. Any attempt to claim expenses in breach of this policy will result in non-payment of the claim. Expenses will normally only be reimbursed if they are:

- claimed using forms that are available;
- submitted within 28 days of returning from travel where the expenses were incurred;
- supported by relevant documents (for example, VAT receipts, tickets, and credit or debit card slips); and
- have received the appropriate authorisation where this is required.

Claims for authorised expenses submitted in accordance with this policy will be paid directly into your bank/building society account.

In exceptional circumstances the Secretary may, at his/her discretion, agree to reimburse expenses that have not been incurred or submitted in accordance with this policy. In each case you should provide full details in advance of the travel of why it was not possible to follow this policy.
Any questions about the reimbursement of expenses should be put to the Secretariat before you incur the relevant costs.