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Management and conservation at the International Whaling Commission: A dichotomy sandwiched within a shifting baseline

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ABSTRACT

The International Whaling Commission's (IWC) Scientific Committee provides important advice to the IWC on a large variety of cetacean species, sub-species and populations and the issues affecting them. Cetaceans are facing increasing, non-whaling-related threats, and the Scientific Committee (SC), in accordance with the Commission's requests, has strengthened its conservation-oriented research work. A selection of the reports of the Scientific Committee from between 1986 and 2012 was assessed for its: (i) fundamental research; (ii) management; (iii) conservation; and (iv) administrative content, and to identify potential trends over time. Recommendations and their urgency were also examined, as implied from the language used by the SC in its reports. The analysis showed that the work of the Scientific Committee has increasingly been oriented towards conservation issues over the period reviewed, but at the same time this conservation work has received little funding. Increased support for conservation-related research projects is warranted to promote the long-term survival of cetaceans. Based on this review of the content and focus of the Committee reports, the analysis suggested that its issued advice be made clearer, whenever possible, and governments are urged to give due consideration to this science-based advice particularly when urgent conservation actions are needed. In addition, more consistent funding of the IWC's conservation-related research should be pursued to improve international conservation outputs regarding cetacean populations.

1. Introduction

In recent decades, the rate of biodiversity loss has increased and human activities have caused the extinction of countless species [1]. Cetaceans are no exception: about 34 species, subspecies and sub-populations are classified as “Critically Endangered” or “Endangered” by the IUCN. The baiji (*Lipotes vexillifer*), a freshwater dolphin from the Yangtse River in China, was declared functionally extinct in 2006 [2] and several other cetacean species and populations are in immediate danger of extinction. Furthermore, the status of most small cetacean populations is poorly known, with 58% of species classified by the IUCN as “Data Deficient” [3], and it is likely that many of the populations of these species are also threatened [4,5].

Cetaceans face an array of existing and emerging threats from anthropogenic activities that include direct removals, bycatch in fisheries, entanglement, ship strikes, pollution by persistent contaminants, outbreaks of infectious diseases and epidemics, climate change, acidification and marine noise pollution [6–12]. Some species are threatened across most of their distributions, some across only part of their ranges, while for others too little information is available to assess their conservation status [4]. Therefore, responding to the conservation needs of cetaceans poses a number of difficulties. Impacts may be cumulative

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and/or synergistic and they are difficult to monitor and assess in relatively short periods of time [4]. For example, it may take decades to establish long-term consequences on a population level, which is sometimes used as an argument to delay actual implementations. Although punctual, non-systematic measurements of the level of impacts are also useful in such cases, in order to avoid depletion or extinction, a precautionary approach is necessary whenever a species, sub-species or population is likely to be threatened or known to be declining. Unfortunately, human-induced mortality of cetaceans continues to increase in many cases.

Using bibliometric analysis to investigate the proportions of published cetacean research from 2005 to 2008 and compared to 1970–1973, Rose et al. [13] demonstrated that a key focus of modern cetacean research is on conservation-related topics, representing a clear shift from the previous basic biological and ecological emphasis. In particular, this shift in cetacean research focus has been mirrored at the International Whaling Commission (IWC), the internationally recognized body responsible for the conservation of whales and management of whaling. The IWC has expanded its areas of interest to ensure the wider conservation of whales. This is reflected in the establishment of the Scientific Committee's (SC) Standing Working Group on Environmental Concerns in 1996 [14] and, in 2003, of the Conservation Committee [15] to facilitate the implementation of a Conservation Agenda and to make conservation-related recommendations to the Commission. In 2009, the IWC endorsed Conservation Management Plans as a practical tool for improving the conservation status of the most at-risk cetacean populations [16].

The increasing amount of work of the SC on conservation-oriented topics has been extensively influenced by the Commission itself, through the adoption of a number of resolutions fostering the establishment of several sub-committees and working groups, as well as by directing the work of the SC on numerous issues such as the Arctic, whalewatching, environmental threats, and small cetaceans. Wright et al. [17] recently reviewed the evolving role of the IWC over the last two decades on climate change, chemical and ocean noise pollution, marine debris, ship strikes and whalewatching, underlining the expanded focus of the IWC SC.

The SC has very regularly provided important management as well as conservation recommendations to the Commission and to other bodies on a large variety of species and issues. The statements made by the SC are substantial for the work of the Commission, *e.g.* by identifying species/populations of special concern, highlighting specific threats or recommending particular mitigation measures.

Table 1
Most commonly used statements in SC reports (normally in the form of "The SC agrees / recommends / supports", *etc.*).

Acknowledges	Expresses with serious concerns	Stresses
Adopts	Expresses regret	Strongly advises
Advises	Notes	Strongly encourages
Agrees	Notes with serious concerns	Strongly endorses
Commends	Reaffirms	Strongly recommends
Concurs	Recognises	Strongly reiterates
Considers	Recommends	Strongly supports
Draws attention	Re-emphasises	Suggests
Emphasises	Reiterates	Supports
Encourages	Requests	Thanks
Endorses	Repeats its recommendation	Urges
Expresses concerns	Repeats its advice	Welcomes

Here a novel approach is presented based on an analysis of statements in the SC reports from 1986 to 2012 to assess the focus given to cetacean fundamental research, management, conservation or administrative matters. This type of statement analysis can help monitor the evolution of the SC and may also be applicable to assess the development of other international fora.

2. Methods

The SC meets annually and provides advice to the IWC. Thirteen SC reports from the annual meetings spanning the period from 1986 (when the global moratorium on commercial whaling was implemented) until 2012 were selected randomly in order to cover each sample period (three from 1986 to 1989, four from each 1990–1999 and 2000–2009, and two from 2010 to 2012) and to ensure a representative overview of the SC's work. The reports were analyzed for statements made in four categories:

- *fundamental research matters* - when a comment/conclusion/recommendation is primarily aimed at *inter alia* gathering new scientific information, ongoing research projects;

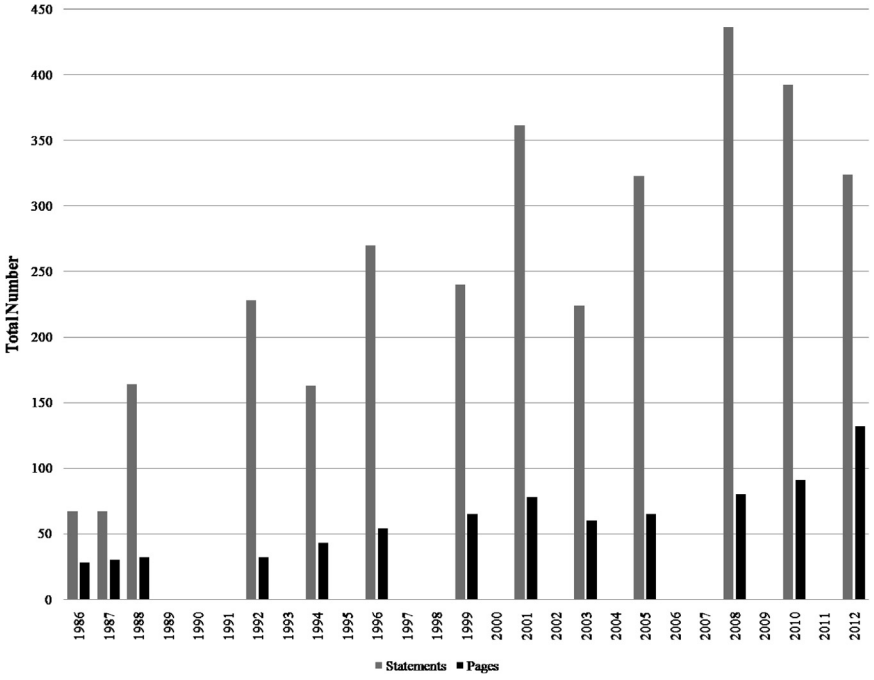

Fig. 1. Number of statements and pages from SC report.

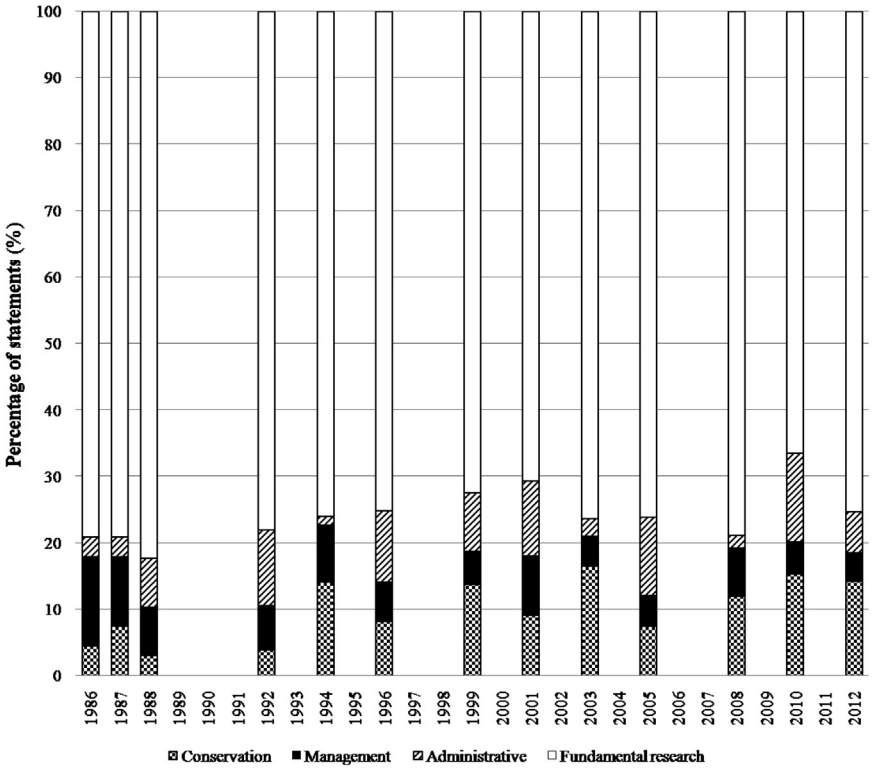

Fig. 2. Percentage of SC statements in the four categories.

- *management matters* - when a comment/conclusion/recommendation is primarily aimed at giving advice regarding direct removals of cetaceans;
- *conservation matters* - when a comment/conclusion/recommendation is primarily aimed at bringing attention to threats and/or status, or improving the conservation of a species/subspecies/population;
- *administrative matters* - when a comment/conclusion/recommendation is primarily aimed at *inter alia* establishing working groups, providing funds for proposals, setting meeting procedures.

These categories are all, of course, primarily "scientific" in nature and thus it may also be argued that pure "fundamental research matters" can have conservation or management implications (or be used as the basis for such efforts) because they provide basic information about the status of cetacean populations. However, it can be easily differentiated according to the categories established above.

The formal statements of the SC include at least 36 standardized terms such as *inter alia* "the SC notes…", "…agrees…", "…expresses concern…", "…recommends…", "…requests…", "…urges…", "…stresses…", "…suggests…", "…welcomes…", "…strongly recommends…", "…strongly expresses concerns…" (Table 1).

the analysis omitted from the analysis:

- the views of authors presenting SC papers and/or comments from

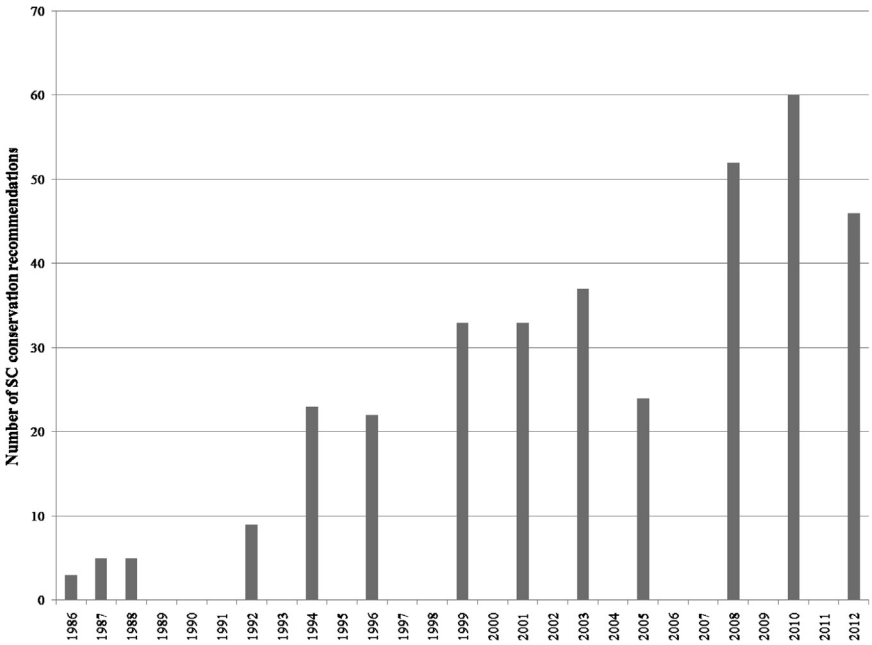

Fig. 3. Number of SC conservation recommendations.

Table 2
Number (#) and percentage (%) of SC statements in the four categories considered from 1986 to 2012.

	Conservation		Management		Scientific		Administrative		Total SC Statements
Year	#	%	#	%	#	%	#	%	
1986	3	4.5	9	13.4	53	79.1	2	3.0	**67**
1987	5	7.5	7	10.4	53	79.1	2	3.0	**67**
1988	5	3.0	12	7.3	135	82.3	12	7.3	**164**
1992	9	3.9	15	6.6	178	78.1	26	11.4	**228**
1994	23	14.1	14	8.6	124	76.1	2	1.2	**163**
1996	22	8.1	16	5.9	203	75.2	29	10.7	**270**
1999	33	13.8	12	5.0	174	72.5	21	8.8	**240**
2001	33	9.1	32	8.9	255	70.6	41	11.4	**361**
2003	37	16.5	10	4.5	171	76.3	6	2.7	**224**
2005	24	7.4	15	4.6	246	76.2	38	11.8	**323**
2008	52	11.9	32	7.3	344	78.9	8	1.8	**436**
2010	60	15.3	19	4.8	261	66.6	52	13.3	**392**
2012	46	14.2	14	4.3	244	75.3	20	6.2	**324**
TOTAL	**352**	**10**	**207**	**7**	**2441**	**76**	**259**	**7**	**3259**

other members during discussions of such papers;
- administrative sections of the report such as “welcome” and “opening remarks”, “meeting arrangements”, “adoption of the agenda”, “review of available data”, “documents and reports”, “funding requirements”, “working methods” unless relevant items were highlighted;
- work plans because they typically merely reiterated previous recommendations made in the report;
- statements that *inter alia* welcomed and acknowledged the contribution of papers, unless these were followed by an additional comment regarding their importance and continuation.

Finally, the SC reports were analyzed from a financial perspective by determining the funding allocated to each of the four, above-listed, categories. Each SC report includes a section on funding requirements and a table with a summary of budget requests. This table from the same year of the report was analyzed and an associated above-mentioned category assigned accordingly. The total budgets were added for each category.

3. Results

From 1986–2012, the breadth of the work of the SC increased steadily and substantively, which can be inferred from the increasing number of subcommittees and working groups, as well as the range of topics addressed by the SC over the years. This is also reflected in the number of pages of the reports and the number of statements in each report - the latter has increased accordingly and is significantly correlated using the Pearson r test, to the number of pages in the SC reports ($p < 0.005$, Fig. 1).

A total of 3259 statements were made in the thirteen SC reports reviewed. Of these, 76% were *fundamental research statements*, 10% were *conservation statements*, while *management* and *administrative* statements represented 7% each. Nonetheless, the percentage in each category has varied annually (Fig. 2). Particularly, although the number of *conservation statements* has increased (Fig. 3), their relative proportion has varied more over the years compared to *fundamental research statements* (Table 2). The number of *management statements* has been relatively stable over time, but their proportion decreased due to the increase in the total number of statements. Also, the higher proportion of *management statements* in 1994, 2001 and 2008 coincides with the development of, and technical discussions on, whaling quota issues, namely the Revised Management Procedure and the Strike Limit Algorithm (Table 2).

Importantly, the reports have been written by the Chair of the SC, who is elected every three years, and the Head of Science has been appointed Rapporteur, during all the period reviewed, with various members of the Committee assisting as appropriate. Therefore the SC statements are not directly influenced by the people writing the reports but rather they represent the true evolution of the SC discussions.

3.1. Small cetaceans

A very interesting case-in-point to illustrate the evolution and complexity of the SC on conservation-related matters has been the work done by the Small Cetacean sub-committee (SCSC). The SCSC addresses the overwhelming majority of cetacean species and the threats they face, thereby making considerable contributions to the conservation agenda of the Commission, representing 44% of the conservation statements. It is also one of the sub-committees that has contributed a large proportion of *fundamental research statements*. In particular, the SCSC has been consistently highlighting the need for conservation of

Table 3
Organizations, conventions and agreements with which the IWC established cooperation between 1986 and 2012.

Name	Abbreviation
Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area	ACCOBAMS
Agreement on the International Dolphin Conservation Programme	AIDCP
Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas	ASCOBANS
Commission for the Conservation of Antarctic Marine Living Resources	CCAMLR
Convention on International Trade in Endangered Species of Wild Flora and Fauna	CITES
Convention on the Conservation of Migratory Species of Wild Animals	CMS
Permanent Commission for the South Pacific	CPPS
Eastern Caribbean Cetacean Commission	ECCO
Food and Agriculture Organisation/ Committee on Fisheries	FAO/ COFI
Inter-American Tropical Tuna Commission	IATTC
International Commission for the Conservation of Atlantic Tunas	ICCAT
International Committee on Marine Mammal Protected Areas	ICMMPA
International Council for the Exploration of the Sea	ICES
International Commission for the South-East Atlantic Fisheries	ICSEAF
International Maritime Organisation	IMO
Indian Ocean Commission	IOC
International Union for the Conservation of Nature	IUCN
North Atlantic Marine Mammal Commission	NAMMCO
North Pacific Marine Science Organisation	PICES
Southern Ocean – Global Ocean Ecosystem Dynamics	SO-GLOBEC
Protocol on Specially Protected Areas and Wildlife of the Cartagena Convention for the Wider Caribbean	SPAW
United Nations Environment Programme	UNEP

Table 4
Topics on which IWC had cooperation with other organizations.

Item	Period				Total
	1986–1989	1990–1999	2000–2009	2010–2012	
Cetacean health	2	0	4	1	7
Climate change	0	1	4	3	8
Conservation	3	7	8	7	25
Ecosystem	3	4	11	6	24
Harvesting marine mammals	2	1	3	3	9
Interaction with fisheries	3	9	21	11	44
Marine debris	0	0	0	2	2
Marine protected areas and critical sites	0	0	1	9	10
Pollution	1	3	7	2	13
Ship strikes	0	0	4	2	6
Sound disturbance	0	2	6	6	14
Species	7	8	18	8	41
Strandings	2	1	2	0	5
TOTAL					**208**

"Critically Endangered" species, sub-species and/or populations. In spite of calls made to prevent extinction, the respective management and conservation actions have usually been delayed and/or have been insufficient. Two key examples include deliberations about the baiji dolphin (*Lipotes vexilifer*) and the vaquita porpoise (*Phocoena sinus*).

The SC reviewed the status of the baiji for more than two decades but was not always consistently strong in its messages. In 2003, the SC congratulated the government of China for its conservation efforts [18]; in 2005, the SC stated that it "*agrees concomitant in situ conservation work should be pursued in areas ostensibly subject to lower levels of risk*" [19]. In that year, however, the SC did not express serious concern on the baiji population status nor did it make additional statements. In 2007 the species was already declared functionally extinct and the SC "*expressed its great concern that, despite extensive scientific discourse for more than two decades, little effort was made to implement any real conservation measures for this species*" [20].

In the case of the vaquita, the SC has expressed concerns since 1990 [21] and has consistently strengthened its call for urgent conservation for this species. SC statements have varied from: "*welcomes this news and thanked the President of Mexico for this important conservation measure*" to "*reiterates its extreme concern on the status…*" and "*strongly recommends that all gillnets should be removed from the upper Gulf of California immediately*". In 1993, a Biosphere Reserve in the Upper Gulf of California and Colorado River Delta was created to protect the vaquita, and in 2005 an additional Refuge Area was created covering the central part of the vaquita's range. In spite of these efforts, few conservation measures have followed until 2015, when the President of Mexico declared a two-year gill net ban, which however, has apparently failed to stem the decline of the species. With only about 60 remaining animals in 2016, and a decline of over 90% since 1997 [22], the vaquita has never been closer to the edge of extinction than at present.

3.2. Cooperation with other organizations

The SC developed a long and continued working relationship with 22 organizations (Table 3) between 1986 and 2012 through different actions which can be summarized as requests for comments on species or topics, develop collaborative research projects, organize joint workshops or establish working groups on a specific topic, among others. Table 4 summarizes those topics on which IWC cooperated with other organizations. The most common subjects dealt with in the co-operation with other organizations were "Interaction with fisheries" (21%), followed by "Species" (*inter alia* distribution, status, feeding ecology, abundance) (20%) and "Conservation" (12%). "Ship strikes" (3%), "Strandings" (2%) and "Marine debris" (1%) were three items with less cooperation established; this does not mean less importance, and in one case (marine debris) reflects the more recent recognition as a cetacean-relevant issue. It is important to highlight that the SC has provided more precise and detailed information on the relationship with other organizations only since 1999.

3.3. Funding[1]

In the thirteen reports reviewed from 1986 to 2012 the IWC allocated a total of £2,845,384 to the SC's work. A large proportion (62%) was directed towards fundamental research (related to knowledge about *inter alia* whale abundance, stock structure, movements), followed by work related to management (18%, *inter alia* the reviewing of special permits, Revised Management Procedure and Aboriginal Whaling Management Procedure) and administrative matters (11%), mostly to fund Invited Participants (IPs). IPs are non-voting members of the Scientific Committee. They can be scientists that have been identified by the Convenors and for which funding will be provided by the IWC if available, or scientists who request to participate in meetings of the Scientific Committee and have their own funding [23]. In this review, IPs refers to those scientists for which IWC provided funding.

Only 9% of the funding was allocated to scientific work with a conservation perspective (to assess *inter alia* threats and investigate mitigation measures for vessel-whale collisions, entanglement, pollution, see Fig. 4). Moreover, most of these funds supported workshops rather than specific field activities such as identification/quantification of threats, modeling or the investigation/testing of mitigation measures (Table 5). The larger expenditure on "conservation" in 1999 corresponds to resolution 1999-5 that allocated £126,000 for research on environmental threats to cetaceans, of which £100,000 was withdrawn from the IWC reserve [24]. Nonetheless, only a small amount of this was actually spent on "conservation" (the Pollution 2000+ project). For example, some debate was generated about the process that allocated £11,400 pounds of Environmental Concern Standing Working Group funds to one month training of SOWER cruise observers on how to identify cetaceans and collect line transect data [25]. Only two SC papers were ever presented to the Environmental Concern Standing Working Group resulting from the SOWER funding [26,27]. There was also funding for SO-GLOBEC/CCAMLR cruises, but the extent to which this advanced the Standing Working Group's work on climate change is up for debate.

[1] The SM sub-committee could not be included in these analyses because funding for this sub-committee has come exclusively from the Small Cetacean Voluntary Fund, established in 1994.

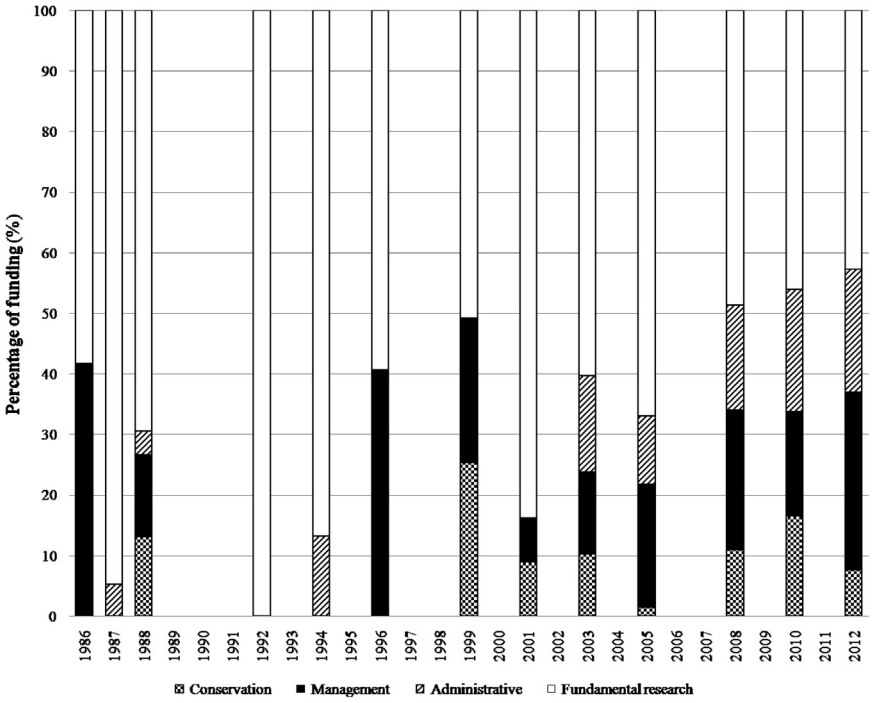

Fig. 4. Percentage of SC funding distributed among the four categories.

Table 5
List of budget requested and allocated to specific conservation-related projects from the SC budget. [1,2]

Year	Project Proposal	Amount Requested (£)	Amount allocated (£)
1988	Meeting on cetacean mortality in fishing nets	30,000	30,000
1999[3]	Pollution 2000+	350,000	63,000
1999	Whalewatching long-term effects workshop	8000	8000
2001	Pollution 2000+	103,000	8200
2001	Fishery-cetacean competition workshop	15,000	10,000
2001	Habitat degradation workshop	31,000	0
2003	Whalewatching intersessional workshop	5000	0
2003	Pollution 2000+	52,000	25,000
2003	Habitat degradation workshop	15,500	0
2005	Impact on cetaceans from seismic surveys workshop	6000	4000
2005	Arctic sea ice – body condition and health	20,000	0
2008	Workshop on Climate Change Implications for Cetaceans	45,000	22,500
2008	Pollution Modeling Workshop: Development of Phase II of Pollution 2000+	1000	1000
2008	Participation in conference on marine mammal protected areas	15,270	10,000
2010	Risk assessment modeling to determine the impact of pollutants on cetacean populations	52,400	52,500
2012	Pre-meeting workshop on assessing the impacts of marine debris	20,500	20,500
2012	Whale watching guidelines and operator training in Oman	3500	3500
TOTAL		**777,170**	**258,200**

[1] Funding for the State of the Cetacean Environment Report (SOCER) was considered as fundamental research since it refers to bibliographic analysis and thus was not included in this conservation-related budget.
[2] In five of the thirteen years (1986, 1987, 1992, 1994, 1996) there was no expenditure on conservation-related projects.
[3] Funding allocated from IWC reserves under resolution 1999-5.

4. Discussion

This analysis shows that the IWC SC has substantively increased the amount of work oriented towards conservation issues between 1986 and 2012. Moreover, while the proportion of *fundamental research statements* and the number of *management statements* have been relatively stable through time, the number of conservation statements has increased. This is consistent with Rose et al. [13], who found that recent cetacean research has increasingly focused on conservation-related topics, reflecting the growing number of threats that cetaceans are facing worldwide.

Importantly, urgent conservation-related statements – or a series of increasingly urgent statements – have not always had the desired effect and highlight the limits of this form of expression in achieving necessary results. This calls for better efforts to bridge the gap between informed, scientifically backed statements and funding along with concrete action. The lack of immediate and effective management actions taken by governments condemn several critically endangered cetacean species, subspecies or populations to depletion or extinction. The greater the delay in adopting effective measures, the greater the likelihood that the conservation of such populations will fail. When the scientific results, and respective SC statements, underline that the first priority should be to implement immediate management actions, then there should be no delay in implementing said actions. Moreover, due attention should be paid to ensure that the actions are implemented effectively, with the IWC undertaking a monitoring role to carefully watch the situation.

Considering the status of cetaceans world-wide, and the heavy conservation-oriented workload of the SC, the conservation category has received comparably little SC funding (9%) in contrast to that

allocated to management (18%) or (non-conservation oriented) fundamental research purposes (62%). Furthermore, funds from the Environmental Concern Standing Working Group that should have helped to address critical conservation issues were diverted to non-conservation focused surveys such as SOWER and SO-GLOBEC/CCAMLR. In this sense, it appears that the funds were not always spent in the way they were intended by the IWC Commissioners.

In addition, most of the budget for conservation-oriented purposes has been allocated to workshops rather than to specific studies directed to evaluate risks or to investigate mitigation measures. Despite poor funding, those conservation activities that have been realized often had a substantive effect on highlighting issues on a global scale (*e.g. inter alia* ship strikes, underwater noise, whalewatching impacts, oil spills, marine debris, emerging diseases). This has led to increasing interest and cooperation (*e.g.* joint sessions) with other SC sub-committees and has, moreover, promoted conservation activity beyond the deliberations of the IWC. Some examples include cooperation with the International Maritime Organisation (IMO) for ship strikes and noise, the United Nations Environment Programme (UNEP) for marine debris, and with the Agreement on the Conservation of Small Cetaceans in the Baltic, North East Atlantic Irish and North Seas (ASCOBANS) and the Agreement on the Conservation of Cetaceans in the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS) as regional cetacean conservation agreements.

A particular case is the Small Cetaceans sub-committee, which encompasses many species that need urgent conservation attention. Notably, it did not receive any direct funding from the SC budget during the period of the review. This is largely because for several years Member States did not agree regarding the IWC's responsibility on small cetaceans. Accordingly, this sub-committee has relied exclusively on the Small Cetacean Voluntary Fund, contributions to which vary substantively from year to year, and hence cannot be considered to be an established funding source.

Based on a review of IWC developments on 2001–2002, Burns and Wandesforde-Smith [28] concluded the IWC will continue to be the focal point for management of commercial whaling in the future and that its legacy in the 21st century will be the ability to confront emerging issues. Wright et al. [17] also concluded that the IWC has expanded its areas of interest to ensure the wider conservation of whales.

This study reveals the dichotomy between management of whaling and conservation of cetaceans within the IWC context. While the agenda on SC conservation-related topics increases, little funding has been actually invested. An increased, and more encompassing, level of support for conservation-related research projects, or mitigation actions, is needed from the IWC Commissioners. This increased support would help to promote the long-term survival of cetacean species, subspecies and populations, clearly a central purpose of the IWC. The IWC's reputation for its highly sophisticated, and globally acknowledged, work on quota regulations for a small subset of cetaceans is at stake if effective efforts are not made to expand the IWC's remit to address the work on the decline and pending extinction of large and small cetaceans.

After this review spanning 1986–2012 was finalized, the IWC adopted in 2014 a consensus resolution on the SC that made significant advances to enhance the conservation of cetaceans and to strengthen the work of the SC, properly reflecting its increasing breadth of work over the past decades. It consolidated the mandate of the Standing sub-committee on Small Cetaceans, included small cetaceans on the general SC budget and created a joint working group between the Conservation Committee and the Scientific Committee to facilitate the implementation and follow-up of conservation recommendations [29]. In this sense, it is expected that recent efforts made by the Commission and the SC to improve the conservation outputs for all cetaceans worldwide will deliver positive results in the short- and long-term.

5. Conclusions

The analysis of reports and statements made by the Scientific Committee of the IWC is a useful tool to track and monitor the evolution of the work of this international body. This review shows increasing involvement and attention being given towards conservation-related topics by the SC. While the SC workload is increasingly conservation-oriented, most funding is still directed to management aspects of direct takes. This fails to support the full fruition of conservation-related projects and jeopardizes the conservation outputs for - and the survival of – cetaceans. The SC evolution is still taking place within the dichotomy of the main focuses of the Commission, namely the conservation of cetaceans and the management of whaling – a framework that itself is shifting in reflection of the state of the world's oceans and rivers and the cetaceans they harbor.

Finally, although the SC has been very clear and consistent in recommending urgent conservation actions for certain species, governments usually take delayed and piecemeal action, which often proves to be insufficient and/or ineffective. This highlights the need to bridge the gap between words, funding and action. When an internationally recognized scientific body repeatedly calls for urgent action, it is extremely important that measures be adopted immediately by the governments of member nations. Any delay sullies science, tarnishes the reputation of recognized international bodies and, most importantly, is detrimental to the survival of species, subspecies and populations crucial to ecosystem function, services and human well-being.

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