

A Draft Conservation Management Plan for Southwest Atlantic Southern Right Whales

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**This Conservation Management Plan was prepared by Argentina, Brazil,
Chile and Uruguay**

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Table of Contents

EXECUTIVE SUMMARY.....	4
1. INTRODUCTION	5
1.1. Why a conservation is needed	5
1.2. Overall Objectives of the CMP	6
2. LEGAL FRAMEWORK	6
2.1. International	6
2.1.1. Whaling	6
2.1.2. Other international fora	6
2.2. National	7
2.2.1. Argentina	7
2.2.2. Brazil	7
2.2.3. Chile	7
2.2.4. Uruguay	8
3. GOVERNANCE	8
3.1. Co-ordination of a CMP	8
3.2. Timeline for a CMP	9
4. SCIENCE	9
4.1. Biology, Status and Environmental Parameters	9
4.1.1. Population structure	9
4.1.2. Distribution and movements	9
4.1.3. Abundance and trends	10
4.1.4. Feeding	10
4.2. Critical habitats	10
4.3. Attributes of the population to be monitored	10
5. THREATS, MITIGATION MEASURES AND MONITORING	11
5.1. Identification of threats	11
5.1.1. Die-off events	11
5.1.2. Kelp-gull harassments	11
5.1.3. Entanglement in fishing gear	12
5.1.4. Ship strikes	12
5.1.5. Coastal developments including hydrocarbon exploration/ extraction	13
5.2. Mitigation measures and monitoring	13
5.2.1. Die-off events	13
5.2.2. Kelp-gull harassment	13
5.2.3. Entanglement in fishing gear	13
5.2.4. Ship strikes	13
5.2.5. Coastal developments including hydrocarbon exploration/ extraction	14
6. ACTIONS	14

6.1. Co-ordination actions	14
6.2. Capacity building and public awareness actions	14
6.3. Research actions essential for providing management advice	14
6.4. Monitoring actions	14
6.5. Mitigation actions	14
6.6. Stakeholder engagement, public awareness and education	15
6.7. Reporting process	15
BIBLIOGRAPHY	16
ACKNOWLEDGEMENTS	17
ANNEX A	18
ACTION CORD-01. Implementation of the Conservation Plan – Co-ordination and Steering Committee.....	18
ACTION PACB-01. Develop a strategy to increase public awareness and build capacity in range States	20
ACTION RES-01. Determine movements, migration routes and location at wintering ground(s) through satellite telemetry	22
ACTION RES-02. Development of a GIS (META) Database on information on human activities that might have an adverse impact on whales.....	23
ACTION MON-01. Ensure long-term monitoring of abundance, trends and biological parameters through photo-identification and biopsy sampling	24
ACTION MON-02. Enhance the existing strandings network including the capacity, for undertaking post-mortems.....	26
ACTION MIT-01. Development of a regional entanglement response strategy	27
ACTION MIT-02. Develop and implement a strategy to minimise kelp-gull harassment	28
ACTION MIT-03. Establishment of an expert advisory panel	30

List of Figures

Fig 1. Range of the Southwest Atlantic Southern right whales population indicating three of the feeding grounds recognized by the IWC (IWC 2001) and the two main nursery grounds (IWC 2012).. 5

List of Tables

Table 1. Summary of actual and potential threats to the nominated population (SRW CMP workshop, Buenos Aires, 19-20 September 2011)..... 31

EXECUTIVE SUMMARY

The Southern Right Whale (SRW) is classified by the International Union for Conservation of Nature (IUCN) as of “Least Concern”. This species was seriously depleted by the whaling industry and even though it was protected since 1935, illegal hunting from the Soviet Union fleet from the 1950s to 1970s delayed any recovery. Even though some of the South Atlantic population are increasing around 7% annually, the survival and recovery of Southwest Atlantic Southern right whales population depends on prompt and effective conservation action throughout their range.

The IWC agreed to nominate the Southwest Atlantic southern right whale population for a Conservation management Plan (SWA SRW CMP) (IWC/63/CC4). A workshop to begin the development of the SWA SRW CMP was held in Buenos Aires, Argentina from 19 – 20 September 2011. Three documents were considered by the SRW CMP workshop: (i) Report of the Southern Right Whale Die-Off Workshop (IWC, 2011), (ii) Draft Proposal for an Action Plan for the Recovery of Eastern South Pacific Southern Right Whales in Chile (IWC/63/CC21Rev) and (iii) Conclusions and outcomes of the IWC Southern Right Whale Assessment workshop that was held in Buenos Aires from 13 – 16 September 2011.

The overall objective of the CMP is to protect southern right whale habitat and minimize anthropogenic threats to maximize the likelihood that southern right whales will recover to healthy levels and recolonise their historical range.

The Conservation Management Plan includes eight sections. Section 1 summarized why a conservation plan is needed.

Section 2 shows the international and national **legal framework**.

Section 3 refers to **Governance** which includes a Coordinator and the timeline. In order to be effective, the conservation plan must have a recognised, **full time Coordinator** which should have a scientific and management background and be an effective communicator to the various stakeholders (intergovernmental and national authorities; representatives from industry; local communities; NGO’s and scientists from several disciplines).

Section 4 provides background information including **biology, status, environmental parameters, critical habitats, attributes of the population to be monitored** of the Southern right whales.

Section 5 describes **threats, mitigation measures and monitoring**. The main identified threats are **die-off events, kelp gull harassments, entanglement in fishing gear, ship strikes, and coastal developments including hydrocarbon exploration/ extraction**.

Section 6 outlines the **actions** describes in detail on coordination, capacity building and public awareness, research essential for providing management advice, monitoring and mitigation measures, stakeholder engagement, public awareness and education, and reporting process.

Table of High Priority Actions

Action nr.	Title of action
CORD-01	Implementation of the CMP – Appointment of a Co-ordinator and stakeholder Steering Committee.
PACB-01	Develop a strategy to increase public awareness and build capacity in range states.
RES-01	Determine movements, migration routes and location of feeding ground(s) through satellite telemetry
RES-02	Development of a GIS (META) database on information on human activities that might have an adverse impact on whales.
MON-01	Ensure long-term monitoring of abundance, trends and biological parameters through photo-identification and biopsy sampling.
MON-02	Enhance the existing stranding networks including the capacity for undertaking post-mortems.
MIT-01	Development of a regional entanglement response strategy.
MIT-02	Develop and implement a strategy to minimise kelp gull harassment.
MIT-03	Establishment of an expert advisory panel.

The most critical and urgent action is the implementation of the Southwest Atlantic Southern right whale population Conservation Plan (CORD-01). Funding must be found for this action at the earliest opportunity to appoint a Coordinator and set up the Steering group to ensure that the Conservation Plan moves ahead in a timely fashion.

1. INTRODUCTION

1.1 Why a conservation plan is needed

The Southern Right Whale (SRW) is classified by the International Union for Conservation of Nature (IUCN) as of 'Least Concern' (Reeves et al., 2003). This species was seriously depleted between the XVIII and XIX centuries by the whaling industry (IWC, 2001); this was true of the Southwest Atlantic where there were large catches throughout the region. Despite international protection, from the 1950s-1970s, the Soviet Union whaling fleet illegally hunted 3,300 southern right whales which delayed any recovery (Tormosov et al. 1998). In recent decades, there has been encouraging documentation of increase in some populations, notably the 'Argentinian' and 'South Africa' populations that have been increasing at around 7% annually (Best 1990, Payne et al. 1990 and Cooke et al., 2001). Although numbers are still small in absolute terms, totalling only about 7,000 animals in 2000 (IWC 2001), there is reason to expect that continued protection will allow substantial recovery (including recovery of range) of at least some of these populations (Best 1993).

However, although the outlook is favourable for some populations, this is not true for all. For example, the South East Pacific (Chile/Peru) population appears to be at very low levels and has been identified as an area of priority consideration and research by the IWC (IWC, 2010). Even for populations with a favourable outlook, actual and potential threats to recovery have been identified. For example, as a result of recent large scale die-offs of SRWs at Peninsula Valdes in Argentina, the IWC held a die-off workshop in 2010 (IWC, 2011) and, on the basis of outcomes from this workshop, recommended that a Conservation Management Plan (CMP) be developed for South West Atlantic population of SRWs. Other actual and potential threats include habitat degradation, ship strikes, entanglement and kelp gull harassment in the nursery areas. Most, if not all of these threats occur in the waters of more than one country (as well as the high seas) and for a migratory species such as this, it essential that an international plan be developed that co-ordinates scientific and management actions.

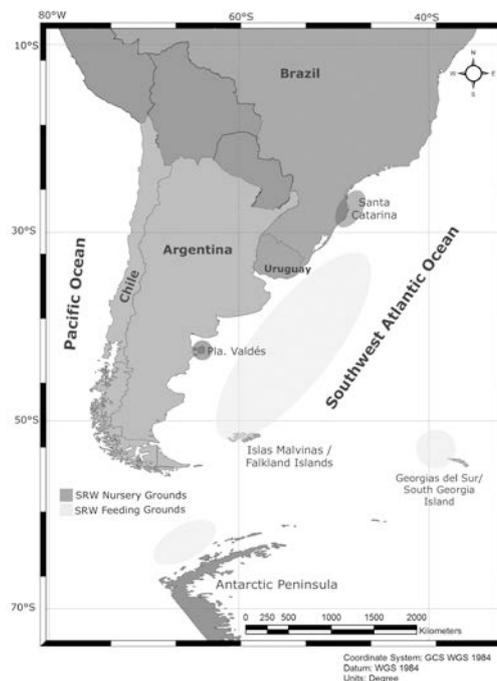


Fig 1. Range of the Southwest Atlantic Southern right whales population indicating three of the feeding grounds recognized by the IWC (IWC 2001) and the two main calving grounds (IWC 2012).

On the basis of the above and various recommendations within the IWC, Argentina, Brazil, Chile, Peru and Uruguay presented a paper to the IWC in 2011 nominating South American SRWs as a candidate for a CMP (IWC/63/CC4). This recommendation was endorsed by the Commission and as a result, this Conservation Management Plan for the Southwest populations has been drafted. A companion CMP has been drafted for the Southeast Pacific population.

1.2 Overall Objectives of the CMP

The overall objective of the CMP is to protect southern right whale habitat and minimize anthropogenic threats to maximize the likelihood that southern right whales will recover to healthy levels and recolonise their historical range.

To achieve this, the plan will provide a platform and framework for range states to work collaboratively and cooperatively to monitor population recovery and to address actual and potential threats to the population. All actions will be undertaken consistent with best available science. This shall be done in co-operation with the wide range of relevant stakeholders, including national and local governments, NGOs, scientists, 'users' (e.g. whalewatching industry, coastal developers, shipping industry, fishing industry and hydrocarbon industry) and the general public.

The CMP will be a living document that is periodically reviewed and updated in the light of new information. The *medium-term objectives* will be developed from the following:

- (1) Identifying, quantifying and developing mitigation measures for known threats and preventing potential threats (issues of concern for the species in the region include: (1) habitat loss; (2) ship strikes; (3) entanglement in fishing gear; and (4) gull attacks, especially on mothers and calves);
- (2) Maintaining (and if necessary instigating) long-term monitoring of distribution, abundance and population parameters to allow periodic review of the efficacy of the plan and its mitigation measures in order to ensure healthy populations within the region;
- (3) Increasing public awareness about the shared population(s) of southern right whales as part of the approach to develop effective measures to protect the animals and their habitat
- (4) Maintaining and improving habitat conditions to encourage continued population expansion and the recolonisation of the historic range

The *short-term objective* will be to develop common quantifiable conservation objectives and to focus on actions related to known threats and/or information gaps within the EEZs of relevant South American countries. Emphasis will be on die-offs events in Argentina, maintaining essential habitat in all areas and (in the partner CMP), on providing a solid scientific understanding of the abundance distribution and movements of the Chile/Peru population so that threats can be identified and effective mitigation measures developed.

2. LEGAL FRAMEWORK

2.1. International

2.1.1 Whaling

Right whales have been afforded formal international protection since the early 20th century, when the impacts of whaling on its populations worldwide were already widely recognized. The 1931 Geneva Convention on the Regulation of Whaling, negotiated under the League of Nations agreed that the killing of right whales would be prohibited. The Convention entered into force in 1935, but the turmoil caused by the II World War largely prevented its proper implementation. In 1946 the International Convention for the Regulation of Whaling (ICRW) was signed and protection for right whales upheld. The International Whaling Commission, formed by the parties to the ICRW in 1949, has since its inception reviewed the status of right whales worldwide and makes recommendations concerning their protection (Palazzo and Galletti Vernazzani, 2011). Argentina, Brazil and Chile adhered to the Convention in 1946 and ratified in 1960, 1974 and 1979 respectively. Uruguay adhered in 2007.

2.1.2 Other international fora

The following table summarized those International or Regional fora related to Southern Right Whales or those manage human activities in the marine environment and signed by Argentina, Brazil, Chile and Uruguay. It also shows the adherence year to each Convention.

Organisation*	Argentina	Brazil	Chile	Uruguay
CMS	1991	NO	1983	1999
CITES	1980	1975	1975	1974
CBD	1992	1992	1992	1992
IMO	1953	1963	1972	1968
UNCLOS	1995	1988	1997	1992
CPPS	NO	NO	1952	NO
MERCOSUR	1991	1991	1996	1991

* CMS-Convention on Migratory Species; CITES-Convention on International Trade in Endangered Species of Wild Fauna and Flora; CBD-Convention on Biological Diversity; IMO-International Maritime Organization; UNCLOS- United Nations Convention on the Law of the Sea; CPPS-Comisión Permanente del Pacífico Sur.

2.2 National

2.2.1 Argentina

2.2.1.1 NATIONAL LEGISLATION

Law N°23,094/1984. Southern right whale was declared National Monument.

Law 25,577/ 2002. Prohibit the capture of cetaceans in Argentinean jurisdictional waters.

2.2.1.2 PROVINCIAL LEGISLATION

2.2.1.2.1 PROVINCE OF RIO NEGRO

Law 3,130 and Decree 1,189. Protect the Southern right whale along its jurisdictional waters and ban its capture.

2.2.1.2.2 PROVINCE OF CHUBUT

Law 2,381/1984. Ban harassment, swimming and diving with marine mammals in province of Chubut's jurisdictional waters.

Law 5,714/ 2008. The Province of Chubut has regulated whale watching almost since the beginning (Decree 916/1986). However, it was not until 2008, following a consultative process which lasted 2 years, that the provincial Law N°5,714 was promulgated which regulates whale watching activities and applied best practices guidelines.

2.2.1.2.3 PROVINCE OF SANTA CRUZ

Law 2,643/2003. Southern right whale was declared Provincial Natural Monument.

2.2.1.2.4 PROVINCE OF TIERRA DEL FUEGO

Law 101/1993. Ban capture and trade of marine mammals.

2.2.2 Brazil

Brazil has a Federal Law (N° 7643) created in 1987 that does not permit whaling in Brazilian waters.

Brazil's jurisdictional waters were created as a cetacean sanctuary by Federal Decree (18th December 2008) in 2008.

A national protected area called APA da Baleia Franca/ICMBio, was created by Federal Decree of 20th September 2000. It was created specifically to protect southern right whales and covers the area of highest density.

In addition, Actions Plans for Conservation have also been developed (e.g. Santa Catarina State in 1995; National in 1997; 2001 and 2011) and in 2011 Brazil established a Brazilian Stranding and Information Network – REMAB.

2.2.3 Chile

The first time large cetaceans were awarded a certain degree of protection against indiscriminate killing under Chilean law was under the declaration of its Exclusive Economic Zone in 23 June 1947, aiming *inter alia* at putting an end to the abuses of the foreign whaling fleets which were decimating whale populations along the coasts of Chile.

The last three whaling stations in Chile operated as joint venture with Japanese companies since 1960's until 1984 when Chile finally suspended the hunting in its waters to comply with the global commercial whaling moratorium adopted by the International Whaling Commission.

In 2008, Chile has enacted a series of legal instruments consolidating a State policy for the protection and non-lethal use of cetaceans, including Decrees 179 and 230 from the Ministry of Economy which respectively prohibit whaling permanently and declare Chilean cetaceans - including the southern right whale -as Natural Monuments and finally the Law for the Protection of Cetaceans (Law 20.293) which bans any type of whaling operations in Chilean jurisdictional waters and set the legal frameworks of additional measures such as penalties, whale watching regulations, and marine protected areas for cetaceans among others.

Whale species are a fundamental part of Chilean natural patrimony. They represent a responsibility towards its conservation and also an economical touristic source for coastal communities. Sustainability is a key component of the National Strategy of Tourism and therefore it promotes a sustainable tourism to preserve whale species for future generations.

2.2.4 Uruguay

The lethal use of cetaceans is prohibited in Uruguayan waters and protection measures have been adopted. Some protection measures include:

- Law 16320 (1992) established the National Fisheries Institute as the government institution with competence on the conservation of whales and other marine mammals in Uruguayan jurisdictional waters.
- Decree 238/998 (1998) prohibits harassment, hunting, fishing and any kind of capture of marine mammals in its jurisdictional waters. It prohibits any action of retention, discomfort or aggression leading to the intentional killing of these marine mammals, and any other form of change, destruction, damage or contamination of all areas. The Decree establishes that any marine mammals caught in fishing operations (i.e. bycatch) should be immediately returned to the sea, with as little damage as possible.
- Decree 261/002 (2002) introduces measures to regulate activities related to the observation and approach to cetaceans. It also creates a regulatory framework for tourism services and nautical activities in areas with concentrations of cetaceans and allows a rational use for tourism (whalewatching).

The Dirección Nacional de Recursos Acuáticos (National Direction of Aquatic Resources - DINARA) is the current Uruguayan government institution directly related to the conservation and preservation of all marine resources including marine mammals. In addition, this Direction encourages and supports non-lethal research of SRW in Uruguayan waters.

In December 2011, DINARA organized a local meeting to explain the future action plan of conservation of SRW. The most important aspects of the background information of the species and the main and future possible threats were presented and discussed with the involved actors (academic researchers, commissioners of different related Ministries, NGOs).

3. GOVERNANCE

3.1 Coordination of a CMP

In order to be effective, experience suggests that CMPs must have a recognised, full-time co-ordinator. This is particularly true for an international initiative such as this where effective conservation requires action (including legislative action) by a number of stakeholders including: intergovernmental and national authorities; representatives from industry; local communities; NGOs; and scientists from several disciplines. At least initially, it is not sufficient for such a Plan to be run part-time. Ideally, the Co-ordinator should have a scientific and management background and be an effective communicator to the various stakeholders. The importance of actively involving stakeholders, especially those whose livelihoods may be affected (e.g. fishermen, whalewatchers), cannot be overemphasised.

The Co-ordinator should report to a Steering Committee appointed with close collaboration between appropriate authorities (see also Action CORD-01).

Inter alia, the Co-ordinator/Steering Committee should:

- promote and coordinate the implementation of the CMP (including investigating funding) with particular attention paid to direct stakeholders;
- gather information on its implementation, the results obtained, the objectives reached, and the difficulties encountered;
- communicate this information to the general public through regular reporting in an accessible format;
- appoint a group of experts to evaluate the effectiveness of the Conservation Plan every three-five years (see below) and to update it. The conclusions of this group should be made public.

Finally, it has to be stressed that the CMP will not be effective without sufficient funding. At the very least, sufficient funds must be made available for the appointment of a co-ordinator and the functioning of the Steering Group at the earliest opportunity.

3.2 Timeline for a CMP

No CMP should be regarded as a definitive and unalterable document. It is rather a document that covers a temporal phase within the framework of the efforts for the conservation of a species, and therefore needs to be reviewed periodically to adjust the actions to the diverse changes that can occur, either in response to the results of the monitoring of the CMP actions themselves or to changing external factors.

It is proposed that this CMP is reviewed annually and updated as needed but that a more thorough review is conducted every three-five years.

The most important *initial stages (within 1 year of approval of this CMP)* are:

- (1) appointment of a Steering Group and co-ordinator;
- (2) full development of the actions outlined below, including all aspects of funding and, as appropriate, contracts to undertake actions.

In order to ensure rapid progress, an interim steering committee comprising the authors of the draft Conservation Plan (Iñiguez Bessega, Galletti Vernazzani, Gilardoni, Le Bas, Luna, Ponce de León and Tombesi) will undertake the initial work.

4. SCIENCE

4.1 Biology, Status and Environmental Parameters

4.1.1 Population structure

At the Southern Right Whale Assessment Workshop (IWC 2012) recent studies suggest the lack of differentiation between individuals from Peninsula Valdés and the feeding ground off South Georgia. It was also showed that whales from Brazil and Argentina belong to the same population although these individuals could mix on the feeding grounds with whales from other genetically distinct calving grounds (e.g. South Africa). The recognition of a single stock of right whales along the Atlantic coast of South America (the Southwest Atlantic population) reinforces the importance to integrated conservation actions and management plans, especially among Argentina, Brazil and Uruguay for the complete recovery of the species in this area. In addition, there is evidence that animals in the Straits of Magellan and the Beagle Channel are from the Southwest Atlantic population whereas animals from north of there are part of the Chile/Peru population.

4.1.2 Distribution and movements

As summarised in IWC (2012), major concentrations of southern right whales are found from May to December on nursery grounds off the coast of Península Valdés (42-43°S) and southern Brazil (27-29°S). Since 2000, increasing numbers of cow/calf pairs, single whales and small groups have been seen to the south and north of Península Valdés, from Cabo Vírgenes (52°19'S) in Santa Cruz Province north to 40°45'S in Rio Negro Province. Whales observed in Santa Cruz province are largely migrating between breeding and feeding grounds.

In Brazil, sightings of solitary animals as well as cow/calf pairs have also been recorded north and south (from 33.8 to 8°S) of the major (27-29°S) nursery ground concentration. Along the coast of Uruguay (33-35°S), solitary individuals and socially active groups of whales (SAGs) are seen regularly during the nursery season with a few sightings of cow/calf pairs.

IWC (2001) identified the known feeding grounds for the Southwest Atlantic population. The only direct link between a nursery and feeding ground comes from five whales identified at Península Valdés that were resighted

on feeding grounds off South Georgia and Shag Rocks (ca 53°S). Whaling records, both from the early 19th century and modern legal and illegal whaling indicate two feeding areas: (1) the Patagonian Shelf/Brazil/False Banks (offshore of southern Brazil, Uruguay and Argentina, between 30° and 55°S, and west of 40°W) from October through January and (2) waters surrounding the Islas Malvinas/Falkland Islands and waters to the north of South Georgia/Shag Rocks (ca 53°S). More recently Moore et al. (1999) reported sightings of live whales in the vicinity of South Georgia from February-May.

Other information on sightings outside the main areas can be found in IWC (2012), along with detailed information on distribution within the main breeding grounds.

4.1.3 Abundance and trends

Analyses of long-term photo-ID mark-recapture studies from Argentinian have shown an annual growth rates of around 7% (Payne et al., 1990 and Cooke et al., 2001), similar to results from South Africa.

The Southern Right Whale Assessment workshop (IWC 2012) received preliminary results from an update of the capture-recapture analysis of the Peninsula Valdes photo-id series (1971-2010). The general results showed continuing but slowing rates of increase over the period (about 6% annually over the whole period but about 5% annually in the last ten years). The number of mature females was estimated at around 960 in 2010 which can be extrapolated to a total population size of about 4,000 whales including calves in 2010. Additional information on changes in calving intervals was also presented. Photo-ID data from southern Brazil were also analysed, (separately from the Argentinean data, because the results of cross-matching were not yet available). These Brazilian data showed a low, stable abundance from 1987 through 1997 followed by an extremely rapid expansion over the following decade which was too fast to be a purely endogenous increase. The results indicated a pulse of immigration, which peaked in the early 2000s. The estimated abundance of mature females in 2010 was estimated at about 200.

However, the evidence of the links between Brazil and Argentina suggested that it was important to combine the datasets from the two areas before reaching any conclusions about either abundance or trends and the Workshop did not include the results of the preliminary analyses in its report. The recommended combined analysis will be presented at the 2012 meeting of the Scientific Committee. The photo-identification data from Uruguay should also be included in the updated cross-matching if time permits.

These long-term datasets are invaluable for providing good information on abundance and other population parameters (e.g. calving rates, age at sexual maturity, survivorship) and trends in these.

For the period 1975-1990, data from Uruguay taken by aerial surveys indicated a total of 190 individuals of SRW in 67 sightings; for the period 2001-2003, 149 individuals were registered in 38 sightings (Costa et al., 2005). Considering both periods, the highest number of sightings was recorded in the period July-October. The maximum number of SRW sighted per year, was 63 in 2001, 44 in 2002 and 51 in 2003 (Costa et al., 2007).

4.1.4 Feeding

Recent stable isotope analyses indicate maternally directed site fidelity to diverse summer feeding grounds for female right whales calving at Península Valdés, Argentina (Valenzuela et al. 2009). The results provide some evidence of a non-homogeneous food source, indicating at least three different feeding areas. Comparison with available stable carbon and nitrogen isotope data from krill and copepods from the western South Atlantic and the Atlantic sector of the Antarctic indicates that areas with isotope values similar to the Polar Front /South Georgia, the Patagonian Shelf and Uruguay represent probable feeding areas for this population. The analyses also provide evidence to suggest that some whales restrict their movements to a specific feeding area while other whales may migrate through and use several different feeding grounds.

4.2 Critical Habitats

To some extent all waters within the range of a migratory species can be considered critical habitat at some period in their life history. However, particularly in terms of coastal waters of South America, the nursery grounds off Brazil and Argentina can certainly be considered critical habitat (see 4.1.2 above). Further work on geographical and temporal distribution and behaviour is required to determine other possible areas that might be deemed 'critical habitat'.

4.3 Attributes of the population to be monitored

The ultimate success or failure of any CMP depends on improvements in the conservation status of the target population(s) – this can only be achieved by monitoring.

The Southwest Atlantic population has the great advantage of already having a long time series of photo-identification data available, originally from Península Valdes in Argentina and more recently from Brazil. It is

absolutely essential that this work continues as the primary monitoring mechanism. Long-term and extensive photo-identification data allow monitoring of:

- (1) absolute abundance and trends in abundance (essential to determine whether the CMP is having an overall conservation benefit);
- (2) quantitative information on biological parameters and trends in those – this includes adult and calf survivorship, calving intervals and age at sexual maturity – these are all important to evaluate the health of the population but also to identify priorities for action and to evaluate the success of mitigation measures.

In addition, it is important to maintain and expand strandings networks which, as in the case of the recent mass die-offs, provide an early warning of problems and allow (e.g. by post mortems of fresh animals) better identification of causes and ultimately mitigation measures.

5. THREATS, MITIGATION MEASURES AND MONITORING

During the SRW CMP workshop held in Buenos Aires (19-20 September 2011) was agreed that this CMP will intend to address mainly short term, immediate threats to small populations. This is not to say that other issues should not be identified in the CMP but that these will not form the focus for action of the CMP. Such issues might include oil spills, inbreeding depression and climate change (table 1).

Three documents were considered by the SRW CMP workshop: (i) Report of the Southern Right Whale Die-Off Workshop (IWC, 2011), (ii) Draft Proposal for an Action Plan for the Recovery of Eastern South Pacific Southern Right Whales in Chile (IWC/63/CC21Rev), (iii) Conclusions and outcomes of the IWC Southern Right Whale Assessment workshop that was held in Buenos Aires from 13 – 16 September 2011. Although the Report of the IWC Southern Right Whale Assessment had not yet been completed, some sections of the report were available and were considered for this document.

The main threats identified are die-off events mainly of calves, kelp gull harassments, ship strike and coastal developments including hydrocarbon exploration/extraction.

5.1 Identification of Threats

5.1.1 Die-off events

This issue was fully addressed in the report of the IWC southern right whale die-off workshop (IWC 2011) and only a brief summary is provided here.

Since 1971, small numbers of southern right whale strandings were recorded. However, in 2003, the Southern Right Whale Health Monitoring Program (SRWHMP) was established. Since that time, a total of 366 right whale deaths have been recorded. Most (333 or 91%) of the deaths have been of first-year calves. The Workshop identified three leading hypotheses to explain the spikes in mortality of first-year whales (calves): reduced food availability for adult females; biotoxins; and infectious diseases. A fourth possible contributing factor, chemical contaminants, was considered less likely, and demographic factors, killer whale attacks, disturbance from whale-watching activities, vessel strikes and fishing gear entanglement were ruled out as significant factors for the high mortalities. The parasitic behaviour of kelp gulls, which eat the skin and blubber of live whales at Península Valdés, opening large wounds and significantly affecting the behaviour of whales, particularly in newborn calves, also received considerable attention as a contributory factor (see Item 5.1.2 below).

Identifying the cause(s) of this unusual mortality is key to be able to understand possible long-term effects on the population and to developing mitigation measures. This requirement provides the basis of a number of high priority actions.

5.1.2 Kelp gull harassments

At the Die-off workshop (IWC, 2011) a detailed review of gull harassments were made. Around Península Valdés, kelp gulls feed on pieces of skin and blubber ripped from the whales' backs, producing severe injuries because once a wound is opened gulls continue to enlarge it. Gull attacks have increased considerably since the first records by Cummings et al. (1972), along with the increase in the gull population. Aerial photography analyses have revealed that the percentage of whales with gull-induced lesions increased from 1% in 1974 to 37.8% in 1990, 67.6% in 2000 and 76.8% in 2008. Gull attack frequency in Golfo San José and Golfo Nuevo has increased between 1995 (about 12%) and 2007-2009 (about 24%); the latter years are those with the highest observed right whale mortality (see Item 5.1.1 above), however further studies must be done in order to relate these events.

The major increase may be a consequence of the population growth of some gull colonies due to the increased availability of garbage and fishery refuse at landfills and offshore in the region. The fact that juvenile gulls attack whales indicates that gulls are able to imitate and quickly learn this behaviour so it is spreading within the local gull population. It is possible that all whales at Península Valdés will have gull-caused lesions in the near future.

Mothers have successfully developed resting and travelling behaviour ('crocodiling' or lying on the back or side) that put their dorsal region, from the blowholes to the caudal peduncle, under water (e.g. Thomas 1988, Rowntree et al. 1998). However, a significant consequence of the success of this maternal gull avoidance behaviour is that gulls now target calves much more frequently than they did in the past such that by 2009, 76% of the attacks ($n=934$) on mother-calf pairs were aimed at the calves and the remaining 24% were aimed at the mothers (Sironi et al., unpublished data).

There are a number of potential population level consequences caused by such a high level of attacks.

- (1) Interruption of resting and nursing bouts and social interactions may affect the physical (energetic costs) and behavioural development (stress associated) of calves and juveniles - this could compromise calf survivorship although a cause-effect relationship would be difficult to prove.
- (2) Transmission of infections: either those carried by and infecting the gulls themselves and/or whale-specific diseases transmitted by the gulls from one individual whale to another.
- (3) Introduction of opportunistic pathogens into the whale via gull-damaged skin.

Given the important potential effects but the difficulty of proving cause-effect, the precautionary approach would be to develop actions that can mitigate the problem in addition to continued monitoring of the situation.

5.1.3 Entanglement in fishing gear

Entanglement in fishing gear is known to be a problem for all cetaceans, including baleen whales (e.g. IWC, 1994) and can lead to death. It can also result in damage to fishing gear. Whether it is a population level problem depends on the numbers involved relative to the total population but it is always an animal welfare problem. Determining numbers is often difficult as many instances may go unrecorded and even where animals do strand and are discovered, determining cause of death is often difficult for a number of reasons. Therefore numbers of deaths due to entanglement may be considerably underestimated (e.g. IWC, 2012). Reports of entanglements of Southern right whales were recorded for Brazilian waters (Greig et al., 2001; Gomes, 2005; Groch, unpublished data) and Argentina (Iñíguez & Gasparrou, 2011; Bellazzi et al., 2012).

For Brazil, between 1936 and 2009, of 55 recorded right whale strandings, the cause of death was only able to be estimated for 10: 4 were caused by entanglements (SC/62/Rep1). During the 2010 breeding season, six entanglements among immature and adult whales were recorded. The suggestion is that the entanglement of right whales is increasing during the breeding season on the southern coast of Santa Catarina State (Pontalti and Danielski, 2011).

For Argentina, in 2002, a one year old Southern right whale was entanglement in an anchored line and later on rescued by local citizens (Iñíguez & Gasparrou, 2011). For Península Valdés waters it was reported 10 entanglements events between 2002 and 2011. In 4 of them, the Red de Fauna Costera (Coastal Fauna Network) from Chubut's Province members rescued the animals (Bellazzi et al., 2012).

Given the potential population level effects and the certain animal welfare issues, it is important both to continue to monitor the issue but also to develop appropriate entanglement response efforts in accordance with the recommendations of the recent IWC entanglement workshop – work on this has already begun (Mattila, 2012).

5.1.4 Ship strikes

As for entanglement in fishing gear, ship strikes (from both large and small vessels) can be a problem for all cetaceans, including baleen whales (e.g. IWC, 1994) and can lead to death. It can also result in human casualties and damage to property. Whether it is a population level problem depends on the numbers involved relative to the total population but it is always an animal welfare problem. Evidence from the North Atlantic right whales off the eastern seaboard of North America illustrates this (e.g. IWC, 2001). Determining numbers is also often difficult and numbers of deaths due to ship strikes may be considerably underestimated (e.g. IWC, 2011). Reports of collision cases with southern right whales were reported for Argentina (Rowntree et al, 2001; Van Waerebeek et al., 2007; Government of Argentina, 2011; IWC, 2012), for Brazil (Greig et al., 2001, Secchi, 1994; Van Waerebeek et al, 2007; IWC, 2012), for Uruguay (García-Píngaro et al. 2010) and for Chile (MFA, 2010).

Given the potential population level effects it is essential to continue to improve efforts to monitor the issue. It is also important to develop co-ordinated mitigation approach efforts in accordance with the recommendations of the recent IWC/ACCOBAMS ship strikes workshop.

5.1.5 Coastal developments including hydrocarbon exploration/extraction

Argentina, Brazil, Uruguay and Chile are developing seismic exploration for oil and gas along their coast. Some of these areas are located in migratory routes of this species. A number of industrial (including aquaculture, port expansion, dredging) and tourism-related coastal developments are underway or are likely to occur in the future. These also have the potential to affect southwest Atlantic right whales (IWC, 2012). It is important that such development projects are subject to rigorous impact assessment that explicitly considers the potential effects on southern right whales. Mitigation measures should be implemented to limit identified risks. *South West Atlantic southern right whales: Summary of anthropogenic threats and assessment of impacts with management recommendations*

5.2 Mitigation Measures and Monitoring

This section focusses on the higher priority threats discussed under Item 5.1.

5.2.1 Die-off events

As noted under Item 5.1.1, the cause of the mass die-offs is not yet known although there are three main hypotheses. Given the need for further information on causes it is important that scientific work continues (IWC, 2011); without better understanding and continued monitoring then it is not possible to develop effective mitigation measures. A key component of this is the enhancement of strandings networks and the capacity to undertake detailed post mortems of as fresh animals as possible. This is the focus of action MON-02.

However, as noted in IWC (2011), a key potential factor in the die-offs relates to the role of kelp gull harassment. This is discussed under Item 5.2.2 below.

5.2.2 Kelp gull harassment

As noted under Item 5.1.2, this is an increasing problem that is extreme in Peninsula Valdes. Despite lack of full information on population-level effects, the precautionary approach is to take action to minimise the threat immediately. Two local workshops and two IWC workshops have discussed this issue and a number of recommendations have been made including covering, closing or consolidating dumps, better management of fish offal (on land and at sea) and direct gull control measures. Finalising and implementing a consolidated strategy is the focus of action MIT-02. Action MON-01 will assist in quantifying the problem.

5.2.3 Entanglement in fishing gear

As noted under Item 5.1.3, while further work is required to quantify the problem of entanglements before an assessment can be made in terms of its priority from a population perspective, it clearly is problematic from an animal welfare and a fisherman's perspective. The need for an effective entanglement response strategy is well recognised and work is already underway on this issue (Mattila, 2012, IWC, 2012). This is the focus of action MIT-01. Actions PACB-01 (public awareness), RES-01 (telemetry) and MON-01 (photo-id) and MON-02 (strandings) will assist in quantifying the problem and in developing targeted mitigation measures.

5.2.4 Ship strikes

As noted under Item 5.1.4, further work is required to quantify the problem of ship strikes although it is of course and animal welfare issue and a problem for mariners. Work on ship strikes and mitigation measures is the focus of the IWC ship strikes working group (SSWG). This has already held one workshop on the subject (IWC, 2012) and developed a series of recommendations for the collection of further information and potential mitigation measures; they are not repeated here but it is clear that the Co-ordinator of the CMP and its Steering Group should collaborate with the SSWG with a view to developing relevant actions in future iterations of the CMP. At this stage of the CMP, four actions are relevant to this: MON-01 (photo-id), MON-02 (strandings) and PACB-01 (public awareness) will assist in quantifying the problem whilst RES-01 (telemetry) and MIT-03 (expert panel) will assist in reviewing specific aspects of the problem and in developing future mitigation measures.

5.2.5 Coastal developments including hydrocarbon exploration/extraction

As noted under Item 5.1.5, increased human activities along the coast and offshore have the potential to adversely affect southern right whales and their habitat. It is essential that such developments are fully reviewed in the context of southern right whales and appropriate and effective mitigation measures implemented where appropriate. In this context national and local authorities should ensure that comprehensive environmental impact assessments are presented and that they are carefully reviewed along with proposed mitigation measures. In order to assist in that review process, action MIT-03 proposes the establishment of an expert panel under the auspices of the CMP.

6. ACTIONS

The actions developed for the plan thus far (Annex A) are related to the primary threats identified for the population as discussed under Item 5.1. They are summarised in the table below. Cross references to related actions are provided but it is important to note that the CMP's success is founded upon action CORD-01, the appointment of a co-ordinator and stakeholder Steering Group (see Item 3 above).

6.1 Co-ordination actions

No.	Action	Importance	Feasibility	Cross refs
CORD-01	Implementation of the CMP: Co-ordinator and Steering Committee	Essential	High	All actions

6.2 Capacity building and public awareness actions

No.	Action	Importance	Feasibility	Cross refs
PACB-01	Develop a strategy to increase public awareness and build capacity in range states	High	High	All actions

6.3 Research actions essential for providing management advice

No.	Action	Importance	Feasibility	Cross refs
RES-01	Determine movements, migration routes and location of feeding ground(s) through satellite telemetry	High	High	All actions
RES-02	Development of a GIS [Meta]database on information on human activities that might have an adverse impact upon whales	Medium-High	To be evaluated as part of action	

6.4 Monitoring actions

No.	Action	Importance	Feasibility	Cross refs
MON-01	Ensure long-term monitoring of abundance, trends and biological parameters through photo-identification and biopsy sampling	High	High	All actions
MON-02	Enhance the existing strandings networks including the capacity for undertaking post-mortems	High	High	

6.5 Mitigation actions

No.	Action	Importance	Feasibility	Cross refs
MIT-01	Development of a regional entanglement response strategy	High	High	All actions
MIT-02	Develop and implement a strategy to minimise kelp gull harassment	High	Medium-high	
MIT-03	Establishment of an expert advisory panel to review environmental impact assessments associated with human activities that may affect southern right whales in the region	High	High	

6.6 Stakeholder Engagement, Public Awareness and Education

Providing range state individuals, groups, organisations, governments, industry and societies with suitable access to information and knowledge about the status of southern right whales and the potential impact that human activities can have on them is essential for meeting conservation objectives. This outreach could be effectively undertaken by use of the mass media, including: internet, newspaper, radio and television. Other activities, including public lectures and forums, education programmes for teachers and students of all ages, and dissemination of information in written and spoken form to whale watch boats and other eco-tourism operations are also an effective means of increasing public awareness.

Capacity building, while similar to public outreach, differs somewhat in that the overarching objective is to foster the procurement of skills and abilities of key individuals and organizations within each of the range states. An example of capacity building is the development of an effective entanglement release response. The transfer of necessary skills is but the initial step, however, in this process. Ultimately, it is hoped that training efforts will translate into both legislative actions and commitment of necessary resources required to assist with the conservation of southern right whales throughout their range in the southwest Atlantic.

6.7 Reporting Process

It will be the responsibility of the appointed Co-ordinator and Steering Group to provide annual progress reports on work undertaken as part of the CMP to the IWC, through its Scientific and Conservation Committees. A major review of work, including the possibility of updating the CMP should occur every four-six years (depending on the timetable of actions within the plan).

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ANNEX A

ACTION CORD-01: IMPLEMENTATION OF THE CONSERVATION PLAN – CO-ORDINATOR AND STEERING COMMITTEE	
Co-ordination Action	Priority: HIGH

DESCRIPTION OF ACTION

Specific objectives: To ensure that timely progress is made with respect to the overall implementation of the CMP and the specific actions included therein, and to provide progress reports for the appropriate bodies including the IWC, the range states and regional stakeholders, thereby maximising the chances of meeting the conservation objectives of the plan.

Rationale: For the CMP to be effective it will require considerable co-ordination. Its success is dependent on a large number of stakeholders in a number of countries and a broad range of areas of expertise. Without a full-time co-ordinator to support a larger representative stakeholder Steering Committee, it is unlikely that the CMP will be successfully implemented in a reasonable timeframe.

Target: The appointment of a Steering Committee for the Conservation Plan and the appointment of a suitably qualified (international conservation science background) full-time Co-ordinator, with appropriate logistical and financial support.

It is envisaged that the Co-ordinator will be based in an institution within one of the Range States that can provide the necessary logistical support. It is suggested that while logistical and other support from a host institution should be paid for at an appropriate rate, it would not be appropriate for overheads to be charged by the host institution on all actions funded.

In order to ensure rapid progress, the Commission should appoint an interim steering committee comprising the authors of the draft Conservation Plan (Iníiguez Bessega, Galletti Vernazzani, Gilardoni, Le Bas, Luna, Ponce de León and Tombesi) will undertake the initial work outlined in the timeline below. It will then be appropriate for a broader stakeholder steering committee to be established with specific terms of reference and *modus operandi*. One of the first tasks of the Steering Committee will be to assess the need for national Sub-coordinators in each of the range states.

Timeline:

	WHAT	WHO	WHEN
(1)	Identification of host institution and agreement on hosting conditions	Interim Steering Committee (ISC)	September 2012
(2)	Development of detailed job description and conditions of work based on the tasks outlined below	ISC	September 2012
(3)	Identification of initial funds	ISC	October 2012
(4)	Recruitment of co-ordinator	ISC	November 2012
(5)	Co-ordinator begins work (initial 3/5 year contract)	Co-ordinator	January 2013
(6)	Development of proposed terms of reference and <i>modus operandi</i> for stakeholder Steering Committee	ISC, IWC, range states	February 2013
(7)	Appointment of Steering Committee	IWC, range states	As soon as possible

Tasks of co-ordinator in conjunction with steering committee:

- (1) To assess the need for national sub-coordinators in each of the range states
- (2) To fully specify and determine appropriate budgets for the Actions of the CMP
- (3) To promote and explain the CMP and progress with its implementation to relevant stakeholders, including:
 - a. International and supranational bodies.
 - b. Range states.
 - c. Managers of local marine protected areas and/or co-ordinators of national plans
 - d. Industry representatives incl. whalewatching, fisheries, hydrocarbon exploration, shipping etc.
 - e. Local authorities.
 - f. NGOs.

- (4) To raise funds for and manage the CMP funds including, where necessary, assigning contracts to ensure that the Actions of the CMP are undertaken and completed.
- (5) To liaise with relevant authorities to facilitate the obtaining of any permits required to undertake Actions of the CMP.
- (6) To: (1) develop an appropriate data availability agreement that respects the rights of researchers; and (2) facilitate data sharing agreements that ensure that existing and new data are made available in timely fashion to maximise their value for southwest Atlantic right whales.
- (7) To develop an appropriate database or databases and co-ordinate the collation in an appropriate electronic format, of data relevant to the implementation of the Conservation Plan including data collected as part of the Actions of the Plan. This should include the facilitation of the use of data on anthropogenic activities, environmental data and whale data in a GIS context.
- (8) To maintain and update the existing list of international and national regulations and guidelines relevant to the conservation and management of southwest Atlantic southern right whales.
- (9) To produce concise Annual Progress reports on the implementation of the CMP.
- (10) To arrange for periodic (3-5 year) expert reviews of the CMP including the development of new actions as appropriate
- (11) To develop a CMP website in co-ordination with the IWC Secretariat as a resource for researchers, stakeholders and the general public.

INITIAL BUDGET ITEMS TO BE CONSIDERED BY THE IWC AND ISC

- (1) Recruitment process (e.g. advertising, travel and subsistence for ISC and shortlisted candidates).
- (2) Host institution annual costs (need to be negotiated by ISC).
- (3) Salary of Co-ordinator (level, tax and benefits issues).
- (4) Initial working budget for co-ordinator (travel and subsistence including visits to range states and meetings with stakeholders).

Given the essential nature of this action to the implementation of the CMP, the IWC should consider making an important contribution to this action. This will require discussion within the Commission and Conservation Committee.

ACTORS

Responsible for co-ordination of the action: The ISC to identify the host institution, obtain initial funding and appoint the co-ordinator; IWC and range states to appoint the broader stakeholder Steering Committee for the Conservation Plan.

Stakeholders: As listed above under 'Tasks'.

ACTION EVALUATION

- IWC
- Regular (e.g. biennial or triennial) meetings open to stakeholders.

PRIORITY

- importance: Essential
- feasibility: High

ACTION PACB-01: DEVELOP A STRATEGY TO INCREASE PUBLIC AWARENESS AND BUILD CAPACITY IN RANGE STATES	
Public Awareness and Capacity Building Action	Priority: HIGH

DESCRIPTION OF ACTION

Specific objective: To develop a strategy specific to each range state for the timely production of a series of resources to inform citizens and stakeholder groups of range states of the status of southwest Atlantic right whales, the potential threats they face and how they can assist in minimising threats, including what they should do if they see animals either at sea (especially if entangled in fishing gear or hit by a vessel) or stranded.

Rationale: It is often difficult to obtain information on southwestern Atlantic right whales away from known concentration areas, especially during migration. Such information can be important in knowing where to target conservation actions for threats such as entanglement in fishing gear and ship strikes (see also Action RES-01). The value of opportunistic observations should be maximised using the variety of communication techniques available, including the internet, newspapers, radio and television. The information obtained will be of direct value to conservation efforts in a number of ways.

Target: To develop a strategy and Actions to produce a variety of targeted, accurate, public awareness resources that will inform people on the southwest Atlantic right whales and on how citizens can assist in conservation efforts including what they should do if they encounter living or dead whales. ‘Targeted’ refers to a variety of categories of persons (there will be overlap), to be determined but certainly including, for each range state: mariners (and their trade associations where applicable), fishermen (and their trade associations where applicable), whalewatching operations, NGOs, research institutes, schools. Such efforts will need oversight by the Co-ordinator and Steering Committee such that local differences are accounted for but ensuring overall consistency and accuracy. The Conservation Plan website will play an important role (see Actions CORD-01 and CORD-02).

Timeline:

	WHAT	WHO	WHEN
(1)	Preparation for a small expert workshop to develop a strategy for the public awareness effort	Interim Steering Committee (ISC) – see Action CORD-01	December 2012
(2)	Hold workshop	Identified participants (see methods below)	March 2013
(3)	Implement strategy and actions agreed by workshop following a timeline established by the workshop (probably a staged process)	Workshop, Co-ordinator, stakeholder SC	To be determined

Methods: The ISC begin preparations for a small expert workshop to determine the strategy for public awareness materials, including:

- (1) Identification of target groups, by range state where appropriate.
- (2) Identification of existing/development of new text, audio and visual material to provide general background to the situation of southern right whales; consideration should be given to how this material may need to be varied for any of the target groups.
- (3) Identification of existing/development of new text, audio and visual material to provide information on what to do if one encounters a living or dead animal; consideration should be given to how this material may need to be varied for any of the target groups, taking into account Actions MIT-01 and MIT-02.
- (4) Identify/ensure that mechanisms are in place to receive, review and incorporate information (data, photos, tissues etc.) for maximum conservation benefit, taking into account Actions CORD-01 and CORD-02.
- (5) Determine a mechanism to ensure that the general objective/target is met in as timely a fashion as possible, including specific actions, a budget and a timeline.
- (6) **attendees** should include:
 - (1) Co-ordinator of the CMP
 - (2) Representatives of the stakeholder Steering Committee.
 - (3) Scientists familiar with the southern right whale situation in the region (incl. die-offs, gull attacks, entanglement, ship strikes and seismic surveys) and associated mitigation measures.
 - (4) Scientists familiar with incorporating data from the general public – e.g. IWC ship strikes project (http://www.iwcoffice.org/sci_com/shipstrikes.htm).

- (5) Public awareness experts from each country.

ACTORS

Responsible for co-ordination of the action: The ISC to begin preparations for the holding of the workshop, subsequently the Co-ordinator and broader stakeholder Steering Committee for the CMP.

Responsible for carrying out the workshop agreed action: To be determined at workshop.

Stakeholders: All

ACTION EVALUATION

- IUCN, IWC.
- Feedback system built in to materials.

PRIORITY

- importance: High
- feasibility: High

ACTION RES-01: DETERMINE MOVEMENTS, MIGRATION ROUTES AND LOCATION OF WINTERING GROUND(S) THROUGH SATELLITE TELEMETRY	
Research Action	Priority: HIGH

DESCRIPTION OF ACTION

Specific objective: better determine southwest Atlantic southern right whale movements, migration routes and feeding ground(s). Specifically, this work is intended to:

- (1) Determine the migratory timing and routes between summer feeding and winter breeding areas.
- (2) Improve the ability to assess potential threats along the migration routes and identify areas where mitigation is most critically needed.
- (3) Improve understanding of the movements of southwest Atlantic right whales between and among breeding/calving habitats in the expectation that this would (i) improve understanding of movements, allowing improved population assessment (see IWC, 2011), and (ii) point to additional areas in need of protection from potentially harmful human activities.

Rationale: It is often difficult to obtain information on southwestern Atlantic right whales away from known concentration areas, especially during migration. Recent photo-identification data has also shown the links between Argentina and Brazil that require incorporation into the mark-recapture population assessment that is so important to monitoring whether conservation actions and targets are being met.

Specific threats to be addressed: Better information on geographical and temporal distribution/movements is important in determining where to target conservation actions for threats such as entanglement in fishing gear and ship strikes as well as evaluating potential development projects and seismic surveys (see also Action PACB-01).

Target: To gain a good understanding of the movements, migration routes and location of the wintering ground(s) and, where possible, combine telemetry data with information on threat factors such as fishing, shipping and industrial operations (see Action RES-02).

Timeline:

	WHAT	WHO	WHEN
(1)	Preparation of a detailed telemetry programme including sample sizes, timing and choice of field area	Co-ordinator, ISC, regional scientists. IWC-SC	SC65
(2)	Determine budget and seek funds	Co-ordinator and identified scientists	SC65 and beyond
(3)	Implement field programme	Identified scientists	To be determined

Methods: Satellite telemetry, following advice, guidance and safeguards provided by IWC SC

ACTORS

Responsible for co-ordination of the action (including finding funds): The Co-ordinator and stakeholder Steering Committee for the CMP.

Responsible for carrying out the action: Scientists determined by Co-ordinator, IWC-SC for guidance

ACTION EVALUATION

- IWC.

PRIORITY

- importance: High
- feasibility: High

ACTION RES-02: DEVELOPMENT OF A GIS [META]DATABASE ON INFORMATION ON HUMAN ACTIVITIES THAT MIGHT HAVE AN ADVERSE IMPACT ON WHALES

Research Action	Priority: MODERATE-HIGH
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DESCRIPTION OF ACTION

Specific objective: To identify the temporal and geographic information available on actual and potential threats to southwest Atlantic southern right whales.

Rationale: It is important to be able to identify human activities that might pose a threat to whales so that information in their temporal and geographic location can be overlaid on that of the whales. Initially, key information to be gathered includes that on extent and nature of fishing operations; extent and nature of vessel traffic; proposed seismic surveys; proposed coastal developments.

Target: To develop an eventually comprehensive database of information on human activities (actual and proposed) to provide a resource for scientists and range states when evaluating priority areas/subjects for additional protection/mitigation or for considering environmental impact assessments.

Timeline:

	WHAT	WHO	WHEN
(1)	Identification of existing sources of information on human activities (e.g. fishing, shipping and development information)	Stakeholder Steering Committee, Co-ordinator	March 2013
(2)	Preparation of a proposal for the structure and content of a GIS database (or metadatabase) based on (1)	Stakeholder Steering Committee, Co-ordinator, IWC-SC review	Prior to SC65
(3)	Identification of funds and contractor for database development and population	Workshop, Co-ordinator, stakeholder SC	To be determined

Methods: The stakeholder steering Committee will begin work on part (1) of this action once it has been formed (see Action CO-ORD1):

ACTORS

Responsible for co-ordination of the action: The Co-ordinator and broader stakeholder Steering Committee for the CMP.

Responsible for carrying out the action: As above with review by IWC

Stakeholders: All

ACTION EVALUATION

- IWC

PRIORITY

- importance: Medium-High
- feasibility: To be evaluated as part of the action

ACTION MON-01: ENSURE LONG-TERM MONITORING OF ABUNDANCE, TRENDS AND BIOLOGICAL PARAMETERS THROUGH PHOTO-IDENTIFICATION AND BIOPSY SAMPLING	
Monitoring Action	Priority: HIGH Feasibility: HIGH

DESCRIPTION OF ACTION

Specific objective: Ensure that annual monitoring of abundance and trends, through photo-identification and genetic biopsy sampling, is conducted at an appropriate level.

Specific threats to be mitigated: While not a mitigation action *per se*, this action is essential as it will provide an integrated picture as to whether mitigation measures are working and may provide some insight into areas where additional mitigation measures may be needed. The photographic and biopsy information also is of great value for investigating the causes of the mass die-off as noted in IWC (2011).

Rationale: Continued monitoring of the population and regular updates of a population assessment (e.g. see right whale workshop report) are essential for meeting conservation objectives. Any adverse demographic changes, should they occur, must be detected as soon as possible so that remedial actions can be taken. New information has shown the importance of integrated analyses from Brazil and Argentina. Valuable information is also being collected from Uruguay. A power analysis should be undertaken to determine the necessary scale of future photo-identification effort, in terms of days in the field, location and time interval between surveys, needed to detect any warning changes in abundance, calf production or other biological parameters. An additional attribute to be monitored is body condition/health of individual whales. A long time series of individual-animal data collected creates the possibility of detecting changes in condition (a potential proxy for animal health or quality of foraging habitat) over time. This is could be important in examining the effects of kelp gull attacks and in examining die-offs.

Target: Continued collection of photographic, body condition and genetic data on an annual basis.

Timeline:

	WHAT	WHO	WHEN
(1)	Review of updated analysis that will be presented at IWC64 incorporating data from Argentina and Brazil	Cooke and colleagues, IWC-SC	IWC64
(2)	Power analyses to confirm necessary levels of effort to ensure that important trends can be detected	Cooke and colleagues, IWC-SC	IWC-64 or later
(3)	Necessary fieldwork in the light of (2)	Scientists	Continuing
(4)	Consideration of most appropriate way to store and share data (including consideration of single catalogue and a single biopsy sample repository organisation)	Scientists, co-ordinator	Continuing
(5)	Ensure adequate long-term funding	Range states, co-ordinator, Steering group	Continuing

Methods: Updated assessment model integrating Argentina and Brazil data being developed and analyses will be presented at IWC64. Power analyses to be conducted to look at levels of effort required. Further consideration of health index from photographs should be undertaken.

ACTORS

Responsible for co-ordination of the action: The Co-ordinator, range states and scientists

Responsible for carrying out the agreed action: The Co-ordinator, range states and scientists

Stakeholders: All

ACTION EVALUATION

- IWC

PRIORITY

- importance: High
- feasibility: High

ACTION MON-02: ENHANCE THE EXISTING STRANDINGS NETWORKS INCLUDING THE CAPACITY FOR UNDERTAKING POST-MORTEMS	
Monitoring Action	Priority: HIGH Feasibility: HIGH

DESCRIPTION OF ACTION

Specific objective: To review and enhance the existing strandings networks in the region, standardise regional data recording and reporting, enhance tissue collection and storage, and develop common protocols

Specific threats to be mitigated: While not a mitigation action *per se*, this action is essential to provide necessary scientific information on the causes of the recent mass die-offs (IWC, 2011) and further information on entanglements and ship strikes.

Rationale: There is already excellent work being undertaken by strandings networks in the region. However, it is essential to build upon this and enhance the dedicated work already being undertaken, as recommended in IWC (2011).

Target: Enhance regional work to quantify strandings information and to assist in identifying causes of death, especially for mass mortality events, ship strikes and entanglements.

Timeline:

	WHAT	WHO	WHEN
(1)	Review latest work on post-mortem examination techniques relevant to ship strikes, entanglement and the main hypotheses for the die-off (IWC, 2011)	IWC-SC	IWC64 and beyond
(2)	Consider whether there is a need to update protocols or in other ways	regional scientists and other experts	IWC-64 and beyond
(3)	Refine protocols for tissue storage and analyses following recommendations in IWC (2011)	regional scientists and other experts	
(4)	Enhance the logistical capacity of the Southern Right Whale Health Monitoring Program and other networks, including provision of equipment, following the recommendations in IWC (2011) if not already done	Range states, Co-ordinator, regional experts	As soon as possible
(5)	Ensure adequate long-term funding	Range states, Co-ordinator, Steering group	Continuing

Methods: Updated assessment model integrating Argentina and Brazil data being developed and analyses will be presented at IWC64. Power analyses to be conducted to look at levels of effort required. Further consideration of health index from photographs should be undertaken.

ACTORS

Responsible for co-ordination of the action: The Co-ordinator, and Steering Group

Responsible for carrying out the agreed action: The Co-ordinator, range states and scientists

Stakeholders: All

ACTION EVALUATION

- IWC

ACTION MIT-01: DEVELOPMENT OF A REGIONAL ENTANGLEMENT RESPONSE STRATEGY	
Mitigation Action	Priority: HIGH Feasibility: HIGH

DESCRIPTION OF ACTION

Specific objective: To develop a entanglement response strategy for the region including the holding of IWC training workshops (already started), the establishment of one or more entanglement response teams, development of materials for fishermen and other ocean users and the central reporting of data.

Rationale: Entanglement in fishing gear is problematic from a number of perspectives: animal welfare, possible population level effects (although these appear low there are insufficient data to confirm this) and damage to fishing gear. Note that an ultimate goal will be to prevent entanglements altogether.

Target: To develop a strategy and actions to produce a co-ordinated entanglement response strategy building upon the work and recommendations of the recent IWC Workshop (IWC/64/WKM&AWI REP1) on training, apprenticeships, public awareness materials and data collection.

Timeline:

	WHAT	WHO	WHEN
(1)	Review progress and determine need for further training in entanglement response	Range state representatives and IWC expert panel	IWC64
(2)	Arrange for apprenticeships for selected candidates at existing centres of excellence for entanglement response	Co-ordinator, range states, IWC expert panel	Boreal Summer 2012
(3)	Develop information materials for fishermen and ocean users in conjunction with IWC	Co-ordinator, relevant experts, IWC expert panel	March 2013 (workshop)
(4)	Determine data collection and reporting mechanism for entanglements (at sea and stranded animals) in conjunction with the proposed IWC database	Co-ordinator, relevant experts, IWC database team	March 2013 (above workshop)
(5)	Finalise a region-wide strategy for entanglement response	Co-ordinator, relevant experts, IWC expert panel	March 2013 (above workshop)

Methods: There has already been one training exercise in March 2012 in Argentina as well as one in Brazil. It is important to build upon this experience and determine the need for future training. Following the recent IWC workshop it is clear that a 2-day training workshop is an essential start to the development of one or more entanglement response teams but that it necessary for selected individuals to undergo more thorough training at IWC-approved centres. Finalising information materials, data collection and reporting mechanisms and the overall entanglement response strategy would probably best be finalised at a small expert workshop after initial work by email.

ACTORS

Responsible for co-ordination of the action: The Co-ordinator, range states and IWC expert panel

Responsible for carrying out the agreed action: The Co-ordinator, IWC expert panel, candidates selected for training

Stakeholders: Fishermen, range states, IWC

ACTION EVALUATION

- IWC, Steering Group

ACTION MIT-02: DEVELOP AND IMPLEMENT A STRATEGY TO MINIMISE KELP GULL HARASSMENT	
Management Action	Priority: HIGH Feasibility: HIGH

DESCRIPTION OF ACTION

Specific objective: To build upon previous work and finalise and implement a strategy to minimise kelp gull harassment, especially in Peninsula Valdes but also to prevent similar scale harassment occurring off Brazil.

Specific threats to be mitigated: There are a number of potential population level consequences caused by a high level of kelp gull attacks (which may also be one key component of the mass die-offs):

- (1) energetic costs and adversely affected behavioural development;
- (2) transmission of infections;
- (3) introduction of opportunistic pathogens.

Rationale: Although development of a fully-specified cause-effect relationship is scientifically difficult, it is clear that the increase in kelp gull harassment cannot have a positive effect on the population and a precautionary approach is to take mitigation action now as well as continuing scientific investigations, as recommended in IWC (2011) and IWC (2012).

Target: To work with whale and gull experts, local authorities and others to review previous work and develop a practical management strategy and implement it within three years.

Timeline:

	WHAT	WHO	WHEN
(1)	Hold workshop to (a) review previous work and recommendations (including local workshops in 2004 and 2008 as well as IWC, 2011 and 2012); (b) develop a pragmatic, costed mitigation strategy to address this issue, especially but not exclusively for Argentina; (c) develop a disease sampling programme for gulls that are seen to attack right whales.	Co-ordinator, Steering Group, whale and gull experts, local authorities,	To be determined by co-ordinator and Steering Group but before IWC 65
(2)	Implement the strategy developed at the above workshop	To be determined by workshop	As soon as possible
(3)	Continue to monitor the frequency of gull attacks (in the field and through examination of photographs) throughout the range and exchange information to enable determination of whether developed strategy is successful when implemented	regional scientists	Long-term

Methods: Despite earlier work and recommendations, the kelp gull problem at Peninsula Valdes continues to increase (IWC, 2011; 2012). It is essential that all stakeholders meet to develop a pragmatic strategy and ensure its prompt implementation. This can only be achieved via a well-prepared focussed workshop and allocation of sufficient funds (and, if necessary legal measures) to implement it.

ACTORS

Responsible for co-ordination of the action: The Co-ordinator and Steering Group

Responsible for carrying out the agreed action: The Co-ordinator, Steering Group, invited stakeholder participants, local and national authorities

Stakeholders: All

ACTION EVALUATION

- IWC

ACTION MIT-03: ESTABLISHMENT OF AN EXPERT ADVISORY PANEL	
Mitigation Action	Priority: HIGH Feasibility: HIGH

DESCRIPTION OF ACTION

Specific objective: To establish an expert advisory panel to assist national and local authorities in the review of environmental impact assessments and proposed mitigation measures associated with human activities that may affect southern right whales in the region.

Specific threats to be mitigated: IWC (2011 and 2012) identified a number of human activities that may affect southern right whales in the future including those associated with coastal developments, aquaculture and fishing, and activities related to marine hydrocarbon exploration and removal (including seismic surveys).

Rationale: Although developers are usually asked to provide environmental impact assessments (EIAs), these can often be lengthy, consider a wide range of factors and may not take southern right whales sufficiently into account. It may also be the case that the reviewers of the EIA do not have sufficient expertise on whales to fully evaluate proposals. The panel would be available to provide advice on proposed activities should it be requested.

Target: To identify and establish an advisory panel and its *modus operandii*

Timeline:

	WHAT	WHO	WHEN
(1)	To identify and establish an advisory panel and its <i>modus operandii</i>	Co-ordinator, IWC-SC	As soon as possible after the appointment of the Co-ordinator

Methods: the Co-ordinator should consult with range state scientists and the IWC-SC and determine a panel of experts who would be able to fill such a role. Once a panel and *modus operandii* have been established, the co-ordinator should inform national and regional authorities of its availability to assist them if requested

ACTORS

Responsible for co-ordination of the action: The Co-ordinator and Steering Group

Responsible for carrying out the agreed action: The Co-ordinator, expert panel

Stakeholders: All

ACTION EVALUATION

- IWC

Table 1. Summary of actual and potential threats to the nominated population (SRW CMP workshop, Buenos Aires, 19-20 September 2011)

Actual/Potential Threat	Country	Cause or related activity	Likelihood	Possible Impact (at population level)	Priority for Action	Relevant Actions	Responsible or interested parties
Directly lethal threats							
Entanglement	Brazil	coastal fishing gear, gillnet, aquaculture gear	Strong	Moderate to minor	Medium to high	Disentanglement workshops - Management Plan for the SRW Environmental Protection Area - Establishment of seasonal closure or restrictions of fishing gear in the MPA.- Promote the establishment of a Disentanglement team	ICMBio
	Uruguay	coastal fishing gear, gillnet, aquaculture gear	Moderate	Moderate to minor	Medium to Low	Monitor the evidence of by catch - Implementation of a management plan for MPAs	DINARA – Sistema Nacional de Areas Protegidas (SNAP)
	Argentina	Fishing and Aquaculture activities. Nautical activities.	Moderate	Moderate to minor	Medium to Low	Disentanglement workshops - Assessment on aquaculture facilities and potential impacts. Consider high concentrations areas of SRW before to give aquaculture	National and Provincial governmental agencies. NGO's

						permits. Develop systems to avoid interactions between nautical activities and whales. Promote the establishment of a Disentanglement team. Monitor entanglement impact on SRW and maintain a data base to quantify entanglement events. Promote manage spatial planning.	
	Chile / Magallanes	Aquaculture - King crab, false king crab and other fisheries	Strong	Moderate to minor	Medium to high	Disentanglement workshops - Assessment on aquaculture facilities and potential impacts -Promote the establishment of a Disentanglement team	Sernapesca, research institutions, NGO's
Ship Strikes	Brazil	Commercial shipping	Strong to moderate	Moderate to minor	Medium	Implementation of a warning system and reduced vessel speed during calving season in areas of concentration especially in Imbituba -	ICMBio

					Implementation National Action plan for large whales. Improve reporting to relevant databases (IWC , IMO , others). Promote marine spatial planning.	
Uruguay	Commercial, recreative and military shipping	Strong	Moderate to minor	High to Medium	Adopt a warning system and the proper regulation to reduce ship strikes in areas of high concentration of SRW, Implement a monitoring program on dead whales. Improve reporting to relevant databases (IWC , IMO , others).	DINARA – Prefectura Nacional Naval (PNN)
Argentina	Commercial, recreational, military shipping	Strong	Moderate to minor	High to Medium	Adopt a warning system and regulations to reduce ship strikes in areas of high concentration of SRW . Improve the warning system and regulations to reduce ship strikes in Golfo Nuevo, Península Valdés, Chubut.	Prefectura Naval Argentina, provincial governmental authorities, port authorities, research institutions, NGO's

						Improve reporting to relevant databases (IWC, IMO, others). Support necropsy studies on struck whales	
	Chile / Magallanes	Commercial, recreational shipping	Strong	Moderate to minor	High to Medium	Work with IMO, Improve reporting to relevant databases (IWC , IMO , others)	Foreign Affairs, Directemar

Sub-lethal threats							
Harassment	Brazil	whale watching, recreational boats	Minor	Minor	Low	Continue enforcement of existing regulations specially in the MPA - implementation of Action Plan for Large Whales	ICMBio
	Uruguay	whale watching, recreational boats	Minor	Minor	Low	Continue enforcement of existing regulations - improve control during whale watching season - Implement management plan for MPA.	DINARA - SNAP - PNN
	Argentina	whale watching, swim with whales program, recreational boats.	Strong	Minor to moderate	Medium	Harmonize legal frameworks among the Argentine coastal provinces. Assess the impact on the whole population of whale watching activities and recreational boats along the entire coast. Promote marine spatial planning.	SAYDS, National Ministry of Tourism, provincial governmental authorities, research institutions, NGO's
	Chile / Magallanes	recreational boats	Minor	Minor	Low	Continue enforcement of existing regulations	Directemar, Sernapesca, Subsecretaria de Turismo, NGOs.
Noise	Brazil	marine ship traffic, harbour construction, seismic survey,	Strong	Moderate	High	Inclusion of Right Whale Conservation Considerations and Mitigation Measures in the Environmental Impact Evaluation and Permitting System for Large-Scale Coastal/Marine Projects, Seismic survey and harbour construction restriction in calving grounds season	ICMBio, IBAMA and State Governmental permission for license

	Uruguay	marine ship traffic, seismic survey, harbour construction,	Strong	Moderate	High	Assess impact caused by anthropogenic activities.	DINARA, Dirección Nacional de Medio Ambiente (DINAMA)
	Argentina	marine ship traffic, harbour construction, seismic survey	Strong	Moderate	High	Assess impact caused by anthropogenic activities. Promote marine spatial planning.	National Ministry of Planning, provincial authorities, Research institutions, NGO's.
	Chile / Magallanes	marine ship traffic, seismic survey	Moderate	Moderate	Medium	Assess impact caused by anthropogenic activities. Promote marine spatial planning	Directemar, Subsecretaria de Pesca, research institutions NGO's
Kelp Gull Harassment	Brazil	kelp gull attacks	Minor	Major	Medium	Monitor occurrence of gull attacks to whales - Investigate gull lesions in dead animals - Exchange information with other SRW photo id catalogues - Develop a contingency plan for the event of negative impacts on individual whales or population frequency of attacks	ICMbio (MPA), REMAB
	Uruguay	Unknown kelp gull attacks	Minor	Major	Medium	Monitor possible occurrence of gull attacks to right whales	DINARA, Museo Nacional de Historia Natural (MUNHINA), NGO's, Universities

	Argentina	kelp gull attacks	Strong	Major	Extreme	Follow recommendations of the IWC SRW Die-off workshop (Puerto Madryn, March 2010) and the IWC SRW Assessment workshop (Buenos Aires, Sept 2011). Strengthen the Southern Right Whale Health Monitoring Program (SRWHMP). Strengthen and support research projects aimed at solving this issue. Continue monitoring the frequency of gull attacks annually. Exchange information among SRW photo id catalogues. Adopt measures to address the causes of gull population increase, improve management of garbage landfill and fisheries discard. Implement technical and political workshop to review action plans presented in local workshops in 2004 and 2008 and subsequent meetings to develop action to follow. Work on public awareness.	Provincial governmental authorities, SAyDS, National Park Administration, research institutions, NGO's
	Chile / Magallanes	kelp gull attacks - unknown	Minor	Major	Medium	Monitor occurrence of gull attacks on whales as possible.	Sernapesca, research institutions, NGOs
Die Off	Brazil	not recorded	Minor	Major	Medium	Monitor strandings using standardised protocols, Continue monitoring photo id catalogues, implementation of the National action Plan for large whales.	ICMbio, REMAB

	Uruguay	not recorded	Minor	Major	Medium	Monitor strandings using standardised protocols, Continue monitoring photo id catalogues	DINARA, NGOs, MUNHINA
	Argentina	a decline in food availability, biotoxin exposure and infectious disease	Strong	Major	Extreme	Follow the recommendations from the Report of the IWC SRW die off workshop (SC/62/Rep1) and from the IWC SRW Assessment workshop. Strengthen the Coastal Fauna Network of Chubut and the Southern Right Whale Health Monitoring Program (SRWHMP).	National and Provincial governments. Southern Right Whale Health Monitoring Program (NGO consortium)
	Chile / Magallanes	not recorded	Minor	Major	Medium	Monitor strandings using standardised protocols, Continue monitoring photo id catalogues	Sernapesca, NGOs
Habitat degradation from oil industry	Brazil	Oil spills from transportation, extraction and transfer to/from terminals	Moderate	Moderate	Medium	Review existing spill emergency contingency plans to incorporate measures to safeguard whale population - Inclusion of Right Whale Conservation Considerations and Mitigation Measures in the Environmental Impact Evaluation and Permitting System for Large-Scale Coastal/Marine Projects - Promote the establishment or strength response centres near by whale concentration areas.	IBAMA, ICMbio, ANP Oil companies

	Uruguay	Oil spills from transportation, and transfer to/from terminals	Moderate	Minor	Low	Review existing spill emergency contingency plans to incorporate measures to safeguard whale population - Promote the establishment or strength response centres nearby whale concentration areas.	DINARA, DINAMA, PNN, Oil companies
	Argentina	Hydrocarbon spills in sea waters from maritime activities.	Moderate	Moderate	Medium	Review existing spill emergency contingency plans to incorporate measures to safeguard whale population. Promote the establishment and/or strengthen the spill response centres near whale concentration areas. Promote marine spatial planning.	PNA ,provincial authorities, oil companies, NGO's.
	Chile / Magallanes	Oil spills from transportation, extraction and transfer to/from terminals	Moderate	Moderate	Medium	Review existing spill emergency contingency plans to incorporate measures to safeguard whale population - Promote the establishment or strength response centres near by whale concentration areas.	Directemar - Oil Companies - NGOs
Aquaculture and fishing	Brazil	aquaculture bivalves	Minor	Minor	Low	Monitor water quality in whale concentrations areas	
	Uruguay	No existence					

	Argentina	aquaculture bivalves	Minor	Minor	Low	Monitor water quality in whale concentrations areas; minimize the presence of marine debris in high whale concentration areas to reduce entanglement. Promote marine spatial planning.	National and Provincial fisheries departments, research institutions, NGO's.
	Chile / Magallanes	salmon farming	Strong	Minor	Medium	Monitor water quality in the whale concentrations areas	Subsecretaria de Pesca, research institutions, NGOs.
Waste water	Brazil	waste water	Strong	Minor	Medium	Continuation of national investments in treatments plants	
	Uruguay		Moderate	Minor	Low	Monitor water quality in the whale concentrations areas	DINAMA
	Argentina	waste water apply for the nursery calving ground	Strong	Moderate to major (*)	High to extreme (*)	Monitor water quality in whale concentrations areas. Assess toxicity of algae and monitor biotoxin levels. Reduce pollution from waste water. Strengthen the SRWHMP	Provincial government of Chubut, research institutions, NGO's.
	Chile / Magallanes		Minor	Minor	Low	Monitor water quality in the whale concentrations areas near Punta Arenas	Subsecretaria de Pesca, Sernapesca, research institutions, NGOs
prey depletion	SW Atlantic	climate change, overfishing of krill, habitat degradation due to pollution	Moderate	Major	High	Work with IGO such as Antarctic Treaty System (Consultive Meetings), IMO.	Ministry of Foreign Affairs, NGO's

(*) SC/62/Rep 1 identified biotoxins and infectious disease as two of the three leading hypotheses to explain the spikes in mortality of first-year whales (calves) in Península Valdés area. See recommendations from the report on page 5.