

Draft Proposal for an  
Action Plan for the Recovery of Eastern South Pacific Southern Right  
Whales in Chile

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by

Palazzo, J.T., and Galletti Vernazzani, B.

## Contents

1 INTRODUCTION .....	1
1.1 Why an Action Plan is Needed .....	1
1.2 Overall Objective of the Action Plan .....	1
2 LEGAL FRAMEWORK .....	2
2.1. International .....	2
2.2 National .....	2
3. FROM WHALING TO CONSERVATION .....	3
3.1 Historical catches .....	3
3.2 Hunting Right whales off Chile in the 20th Century .....	4
3.3. A Sea Change: Whales as a Non-Lethal Use Asset for Chile .....	4
4 BIOLOGY AND STATUS OF Southern Right Whales in Chilean Waters .....	5
4.1 Population structure .....	5
4.2 Distribution, migration and movements .....	5
4.3 Basic biology .....	5
4.4 Abundance and trends .....	6
5 SUMMARY OF ACTUAL AND POTENTIAL ANTHROPOGENIC THREATS .....	6
5.1 Entanglement and vessel strikes .....	6
5.2 Harassment in breeding areas .....	7
5.3 Noise in breeding areas and migratory routes .....	7
5.4. Oil spill direct effects .....	8
5.5. Physical modification of coastal zone .....	8
5.6. Climate Change .....	8
6 PUBLIC AWARENESS AND EDUCATION .....	9
7 ACTIONS .....	9
7.1. Implementation of the Action Plan: Establishment of a Co-ordinator and Steering Committee .....	9
7.2. Research Needs .....	10
7.2.1 Development of a web-based platform to report southern right whale sightings .....	10
7.2.2 Baseline information .....	10
7.2.3 Monitoring .....	11
7.3. General Stakeholder Involvement: Increase public awareness and capacity building along Chilean coast .....	11
7.4. Legal Measures and Enforcement .....	11
7.4.1. Develop and implement contingency plan to afford maximum protection when a sighting is recorded .....	11
7.4.2. Designation of areas for protection of the species .....	11
7.4.3. Inclusion of Right Whale Conservation Considerations and Mitigation Measures in the Environmental Impact Evaluation and Permitting System for Large-Scale Coastal/Marine Projects .....	12
8 REFERENCES .....	12

## 1 INTRODUCTION

### *1.1 Why an Action Plan is Needed*

Despite an observed recovery of several populations in the Southern Hemisphere over the last few decades, the Southern Right Whale (*Eubalaena australis*) is still one of the large cetacean species with fewer individuals worldwide; the eastern South Pacific breeding population, located off Chile and Peru, is likely the smallest surviving population of the species.

Heavily impacted by whaling operations during centuries, Chilean right whales have been classified as Critically Endangered<sup>1</sup>. The population does not show the increasing rates observed in other regions (e.g. the eastern South American seaboard, Southern Africa and Australia), and has a possible mature population size of around 50 individuals<sup>1</sup>. Therefore urgent efforts must be undertaken to ensure that this population recovers from its current status and in particular receives protection from further anthropogenic disturbances that may hamper such recovery.

The State of Policy of Chile regarding the protection and non-lethal use of cetaceans is consolidated in the national law 20.293 for the Protection of Cetaceans. The Action Plan contributes to such policy as well as the fulfillment of Chile's obligations under international law to promote the best possible management of shared cetacean resources that occur in its jurisdictional waters. It is hoped that, in return, the international community will provide the necessary support both to implement the measures recommended in this Plan and, moreover, to ensure that these and other whale species of the Southern Hemisphere are adequately protected when spending part of their life cycle in international waters.

### *1.2 Overall Objective of the Action Plan*

This Action Plan aims to guide and encourage Chilean stakeholders (government, industry, coastal communities and civil society, among others) and international partners to take steps towards the recovery of Southern Right Whales in Chile to population levels that will make the species withstand both environmental and anthropogenic impacts and ensure its long-term survival, while providing for the full incorporation of the species as a recognized Natural Heritage of Chile to be enjoyed through non-lethal means as provided by the State Policy for cetaceans.

## 2 LEGAL FRAMEWORK

### 2.1. *International*

Right whales have been afforded formal international protection since the early 19<sup>th</sup> century, when the impacts of whaling on its populations worldwide were already widely recognized. Upon negotiation by the League of Nations of the 1931 Geneva Convention on the Regulation of Whaling, it was 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. Chile adhered to the Convention in 1946 but only ratified it in 1979 through Decree 489 of the Foreign Affairs Ministry.

Chile is a founding party to the Permanent Commission of the South Pacific (CPPS), now comprised also of Peru, Ecuador and Colombia. CPPS was formed in 1952 and among its initial activities established a whaling normative, *Regulations For Maritime Hunting Operations In The Waters Of The South Pacific*, with detailed measures aimed at ensuring the sustainability of whaling operations<sup>2</sup>; it established that “the hunting and treatment of grey or right whales shall be permitted only in cases where the meat and by-products of these whales are to be used exclusively for consumption by the local population”. Whales under 10.70 meters in length were not to be hunted under any circumstances. This normative has later been abandoned as the ICRW entered into force for Chile and Peru and finally when nations in the region abandoned whaling altogether. Currently CPPS promotes cooperation and coordination of its member States on marine living resource management and provides advice on specific issues as appropriate.

In 1973, Chile adhered to the Convention on the International Trade in Endangered Species of Wild Fauna and Flora – CITES, and ratified it in 14 February 1975. Southern right whales are listed in its Appendix I (full prohibition of international trade).

Southern right whales are also listed in Appendix I (comprising migratory species threatened with extinction) of the Convention on Migratory Species – CMS, to which Chile has been a Party since 1983.

### 2.2 *National*

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.

International whaling interests, mainly from Japan, prevailed for many decades 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.

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.

### 3. FROM WHALING TO CONSERVATION

#### 3.1 Historical catches

Right whales of the genus *Eubalaena* earned their common name due to their being considered the 'right whale to kill'; relatively slow-moving, easy to approach, coming very close to shore during the mating and calving season and yielding a large amount of oil from its blubber. Small wonder then that right whales were the first species to be decimated by the thousands. In Europe, Basque whalers wiped out the Northern right whales (*Eubalaena glacialis*) from the Bay of Biscay and surroundings already between the 11<sup>th</sup> and the 16<sup>th</sup> centuries, moving to the North and South American shores afterwards, literally 'mining' the right whales in their breeding grounds until the targeted populations were either extinct, as the European ones, or brought to the brink of extinction.

Along South Atlantic shores, coastal whaling established by the Basques in 1602 for the southern right whale spread all the way from Salvador de Bahia to Imbituba, Brazil at approximately 27 degrees South<sup>3</sup>, and by the middle of the 18<sup>th</sup> century French, British and American whaling fleets were plundering the South Atlantic for the remnants of this population. The quest for sperm whales and their valuable spermaceti made whalers venture round Cape Horn in large numbers, already as early as the mid-18<sup>th</sup> century, and killing right whales on the way was commonplace<sup>4</sup>. There is a paucity of solid data, however, related to the potential captures of right whales off Chile, which were likely very abundant at the time of European settlement and into the 19<sup>th</sup> Century according to historic reports<sup>5</sup>; it is known that British, French and American whalers - of which in 1792 approximately 40 whaling ships were recorded in Chilean waters<sup>6</sup> - killed large whales off Chile between the 18<sup>th</sup> and 19<sup>th</sup> centuries<sup>7</sup>; whaling grounds extended between approximately 30 and 50 degrees South, with most right whale catches concentrated near the coast<sup>8</sup>. Recorded catches along Chilean coast from the 19<sup>th</sup> century amount to 2,381 animals mostly from French fleets<sup>9</sup>. From 1880 onwards Chilean nationals entered commercial whaling, with the whaling ship *Jane Martin* (350 tons)<sup>10</sup> and the Macaya family presided over a coastal whaling enterprise<sup>11</sup> which also took Southern right besides blue and sperm whales. Several other whaling firms, employing second-hand foreign vessels mostly, would register in Chile at the end of the 19<sup>th</sup> century<sup>12</sup>.

On the other side of the Pacific, Northern right whales were extirpated by Japanese coastal whalers already in the 17<sup>th</sup> century, and newly discovered populations of Southern right whales were systematically destroyed by European settlers in New Zealand and Australia in the 18<sup>th</sup> and early 19<sup>th</sup> centuries.

It is estimated that approximately 15,000 right whales were killed in the South Pacific between 1815 and 1909<sup>13</sup>, and this number does not even take into account British and German whaling in the region nor struck and lost animals.

### 3.2 Hunting Right whales off Chile in the 20th Century

The establishment of the Macaya Brothers whaling firm in Chome (Bio Bio Region), which only closed its doors in the 1980's forced by the global whaling moratorium, was followed in a few decades by other enterprises aimed at 'mining' the large whales off Chile from coastal stations strategically positioned along the coast or using whaling vessels scouting the southern channels of Magellan. In 1904 Punta Arenas already had its first whaling company, Ancud and Valdivia hosting their first ones in 1908, Isla San Pedro South of Chiloe in 1909 and San Carlos de Corral in 1910.

Most likely, these whaling operations had very little regard for discriminating among species, and whenever encountered right whales should have fallen prey to them. Records kept by the International Bureau of Whaling Statistics between 1909 and 1983 show catches in Chilean waters of 45,194 whales, of which 209 were right whales, including 32 killed after the first international bans on the species were established. In the 1934-35 season alone, 37 right whales were reported killed off Chile<sup>14</sup>. There was, however, gross misreporting; for several years Chile did not report catches, the United Kingdom killed thousands of whales in 'pelagic South Pacific' operations in the 1930's, and several thousand more were killed off Peru, and it is likely that many right whales slaughtered in the region went unnoticed by the statistics.

One particular case of misreporting and under-reporting, however, sheds some light on the fate of Southern Hemisphere whales impacted by commercial whaling was the deliberate catch of southern right whales and other protected species by the fleets of the Union of Soviet Socialist Republics (USSR) in the 1960's and 70's.

The breakup of the former Soviet Union allowed for the discovery of extensive under-reporting in its whaling records. Southern Hemisphere whale populations, of supposedly protected species, were particularly impacted. It is estimated that illegal Soviet operations between 1951 and 1971 killed at least 3,349 Southern right whales. No known Soviet pelagic catches of right whales were reported from Chilean waters during this period<sup>15</sup>.

### 3.3. A Sea Change: Whales as a Non-Lethal Use Asset for Chile

The Chilean transition from whaling to whale conservation nation was strongly influenced by the input of civil society towards the consolidation of a sovereign State policy based on the best national interests. Among such interests the *non-lethal use of whale resources* stands out as a major incentive for sustaining such a policy over time.

Recent studies indicate that whalewatching revenues total more than US\$ 2.1 billion annually, benefitting coastal communities in 119 countries and territories<sup>16</sup>. In Latin America, country-by-country studies indicate that the region already earns revenues totaling approximately US\$ 278 million/year and Chile, one of the countries in the region with the fastest recent growth (19.5% between 1998 and 2006) and strongest potential for further development of the activity, already earns around US\$ 2,450,000 annually<sup>17</sup>.

There is great potential for watching several cetacean species along the Chilean coast, and southern right whales, as the population recovers, are among those. However, because of the very small size of the surviving population, particular care should be taken so as not to add tourism as a potential source of disturbance or harassment.

## 4 BIOLOGY AND STATUS OF SOUTHERN RIGHT WHALES IN CHILEAN WATERS

### 4.1 Population structure

The IWC has identified several calving grounds for southern right whales in the Southern Hemisphere<sup>9</sup>. In particular, along the east coast of South America, important calving grounds have been identified off Brazil (8-32°S) and Argentina (42-43°S). It is not known if the Uruguayan coast was an historical reproductive ground that is now being repopulated<sup>18</sup>.

Eastern South Pacific population of southern right whales is found along the coast of Chile and Peru. Reported sightings from the Magellan Straits and Beagle Channel<sup>19,20,21</sup> are likely to correspond to individuals from the Southwest Atlantic population.

Although more data are needed, particularly from photo-identification and genetics analyses, the population off the west coast of Chile and Peru may be considered one population, classified Critically Endangered, while the individuals in Magellan Straits and Beagle Channel may be considered individuals of the Southwest Atlantic population.

### 4.2 Distribution, migration and movements

Southern right whale distribution in the eastern South Pacific is primarily unknown due to the small population size and limited number of sightings.

Main aggregation areas are found in northern Chile (23°S to 25°S) and in central and southern Chile (33°S to 41°S). In general, observations north of 20°S are infrequent, however in recent years three sightings have been reported off the coast of Peru. This could suggest that the range of southern right whales is expanding<sup>22</sup> or a result of increased interest and effort in Peru. The northernmost reported sighting is from 15°08' S in Bahia San Fernando, Peru<sup>23</sup>.

As in the western part of South America, it is probable that there are two major calving areas within the range of the Chile/Peru population; somewhere in northern (15-25°S) and central/southern (33-41°S) areas. Additionally, based on movements of cow-calf pairs, all coastal waters appear to be used as migratory corridors<sup>24</sup>.

### 4.3 Basic biology

*E. australis* make long annual migrations between mid-latitude coastal winter nursery grounds and high-latitude offshore summer feeding grounds where they feed primarily on euphausiids (krill) and copepods. Major wintering grounds have been identified off South America, Australia, New Zealand and South Africa. Southern right whales show maternally inherited site fidelity to near-shore winter nursery grounds and based on female right whales calving at Península Valdés, Argentina, the maternally directed site fidelity is also to feeding grounds<sup>25</sup>.

The IWC has identified five feeding areas<sup>9</sup>. Based on geographical considerations, it has been proposed that southern right whales off Chile may feed in Antarctic Peninsula<sup>26</sup>.

Calving intervals are most frequently every three years<sup>27,28,29</sup>. 17 calves were reported from 1976 to 2007 and assuming a three or four year calving intervals, the Chile-Peru population is likely to have at least seven mature females<sup>24</sup>. Cows reach sexual maturity around nine years<sup>28,29</sup> and gestation and weaning take approximately one year each<sup>30</sup>.

Deleterious impacts of inbreeding depression are potentially the greatest among small populations. The IWC has recognized inbreeding depression as a factor potentially affecting the recovery of right whales and that the threats may only exist for some of the smaller breeding populations such as those off New Zealand and Chile/Peru<sup>9</sup>.

#### 4.4 Abundance and trends

Based on 50 southern right whales sightings reported from 1976 to 2007, the Chile-Peru population does not show any trend of increase in numbers of sightings nor individuals<sup>24</sup> and it is possible that the current population size is below 50 mature individuals<sup>1</sup>

## 5 SUMMARY OF ACTUAL AND POTENTIAL ANTHROPOGENIC THREATS

### 5.1 Entanglement and vessel strikes

Due in part to its biological imperatives of concentrating during the mating/calving season along coastal areas, right whales are particularly vulnerable to negative physical interactions with man-made devices, and have been subject to entanglement in fishing gear and collisions with ships, to the extent that the survival of at least one species, the North Atlantic right whale (*Eubalaena glacialis*), may be impaired by these events<sup>31</sup>. In the Southern Hemisphere, entanglements and ship strikes of several Southern right whales were recorded in Brazil<sup>32,33</sup> and South Africa<sup>34</sup>. Although in these countries the population recovery rate is likely satisfactory enough to overcome the impact of these events, the Chilean right whale population is probably smaller than the western gray whale<sup>35</sup>, and therefore any anthropogenic removal would be very detrimental to the population. Human mortality from entanglement and vessel strikes is a very serious issue for western North Atlantic right whales

In Chile, a calf that bore both net marks (apparently from entanglement) and small-boat propeller stranded in central-southern Chile (37°S) in 1986<sup>36</sup>. On July 2009, a dead southern right whale, probably from the southwest Atlantic Population, was photographed floating at sea in Punta Delgada, Strait of Magellan showing evenly spaced abrasions/gouges in the blubber. Possible reasons were attributed either the whale was hit by a ship or the wounds were deep line abrasions from entanglement<sup>37</sup>.

Although in Southern Chile tourism ship traffic might be of highest concern, in particular because some routes overlap with potential habitat for the remaining population of right whales such as in the Straits of Magellan<sup>19,20,21</sup>, the likely breeding grounds further north are subject to intense and intensifying large ship traffic, both from the existing major harbors of Valparaiso (33°S-71°W) and Talcahuano (37°S-73°W), which directly intersect with known past or recent records of right whales.



## *5.2 Harassment in breeding areas*

There are three recorded cases in Chile of mother/calf pairs being harassed by opportunistic whalewatching by private marine vessels off Arauco Gulf<sup>36</sup> in 1986, Quintay<sup>38</sup> and Laguna Verde in 2008. The first event resulted in the death of the calf while in the second, a contingency plan was implemented by the Chilean Navy to afford maximum protection to the cow-calf pair. Navy personnel were assigned to monitor that no one disturbed the animals. Only land-based whale watching was allowed and no fishing operations were conducted in the area used by the mother and calf during the period of their stay (one month). In the third case, it was not necessary to implement the contingency plan since the pair stayed less than half a day in that area.

Unregulated approaches to mothers and calves may seriously disrupt nursing behavior and result in impacts such as displacement of mother-calf pairs<sup>39</sup> and increases in swim speed<sup>40</sup>, thereby altering the energetic expenditure of the animals, these being of critical importance on such a small surviving population. It has been proposed to allow land-based whale watching to the species<sup>41</sup> and national whale watching regulations that will soon be adopted by the Ministry of Economy includes these special considerations for southern right whales other than the ones found in the waters of Magellan Straits.

## *5.3 Noise in breeding areas and migratory routes*

Over the last few decades, background noise in the world's oceans have increased enormously, in particular due to increased ship traffic and the expansion of seismic surveys for oil and gas<sup>42</sup>. This has led, in some areas, to a detectable impact on whale communication, to the extent that some species have increased the level and frequency of their vocalizations<sup>43</sup>, such as happened with the North Atlantic right whale.

In coastal areas, although noise emitted locally can be muffled somewhat in the shallower depths it can still have a severe localized impact in increasing background noise, thereby increasing the risk of disruption in cetacean communication.

Of particular concern for the Chilean right whales is the increase in traffic noise and prospect of developing large scale coastal energy projects. In this regard, increasing concerns on impacts on cetaceans have been raised by Scientific Committee of IWC<sup>44</sup>.

The increase in ship traffic due to the expansion both of coastal development and international trade also increases pollution of Chilean waters by anthropogenic noise. This is of particular concern as southern right whale migration routes and potential calving areas may be heavily impacted by noise from the port operations in Valparaiso, Talcahuano and Antofagasta. Chilean ship traffic has steadily increased over recent years; container port traffic in 2008 reached 3,123,012.00 TEUs (twenty-foot equivalent units, or a standard-sized container)<sup>45</sup>. Recent traffic statistics from selected ports show that Arica handled around 1.5 million tons of cargo in 2007; Iquique, 2.58 million tons; Valparaiso, 9.7 million tons; and Antofagasta, 2.44 million tons<sup>46</sup>. Several such installations have plans for operational expansion, thereby increasing potential impacts both on noise generation and ship strike probability as mentioned under 5.1.

#### *5.4. Oil spill direct effects*

Oil spills from extraction, transport and storage operations are known to produce severe impacts on the marine biota<sup>47</sup>. If caught in such disastrous events, large whales are known to be negatively impacted. Recently the Gulf of Mexico oil spill is shown to have direct detrimental effect on cetacean species<sup>44</sup>. In Chile, recorded spill events in known right whale habitat such as San Vicente/Talcahuano, Valparaiso/San Antonio and Antofagasta have occurred. Expansion of activities in these and other areas may represent a further risk to the survival of the species as it recovers.

#### *5.5. Physical modification of coastal zone*

Right whales are closely dependent of coastal/inshore zones for their breeding. It is not known to which extent coastal features may affect breeding right whale distribution, other than in some regions they seem to prefer particular embayments for calving<sup>48</sup>. Modification of coastal features such as man-made structures extending out to sea – in particular those that may affect water and sediment dynamics - in areas of potentially vital coastal breeding habitat may result in changes in whale distribution or perhaps abandonment of breeding habitat.

No recent sightings have been documented in San Jorge Bay, near Antofagasta, an area where several sightings occurred during 1980's. Today, the Bay is being used for aquaculture of scallops<sup>24</sup>.

It is not known whether southern Chilean fjords are systematically used by the surviving right whales. The occupation of some areas by extensive mariculture enterprises (e.g. salmon farming) is a cause for concern, not only due to the physical occupation of habitat and hence the increase in the possibility of interactions, but also for the pollution of the surrounding waters by an array of chemicals.

#### *5.6. Climate Change*

There are many dimensions in which human-induced climate change, now an established fact and a serious concern shared by the vast majority of expert scientists<sup>49</sup>, is likely impacting the ecology of cetaceans and the characteristics of their environment. Right whales, however, have been proven to be particularly sensitive to climate oscillations. Studies conducted in the South Atlantic indicate that southern right whale breeding success is affected by climate changes expressed in e.g., sea surface temperature (SST), and even quite small changes in oceanographic conditions in the Southern Ocean could affect right whale population dynamics<sup>50</sup>. High-SST have been correlated with periods of low krill abundance<sup>51</sup>. Matrilineal site fidelity to feeding grounds may limit the exploration of new feeding opportunities<sup>25</sup>, and therefore it raises concern a significant impact on krill abundance<sup>52</sup>.

## 6 PUBLIC AWARENESS AND EDUCATION

Since 2003, dedicated efforts have been conducted under the Southern Right Whale Project/Chile (SRWP/Chile) by the Chilean NGO Centro de Conservacion Cetacea (CCC) with the support of the Chilean Navy. Considering that Chile has a coastline that extends more than 4.000km along the eastern South Pacific, sightings are difficult to document. The National Marine Mammal Sighting Network was established by CCC to promote the active involvement of a variety of stakeholders in the collection of sighting data of the species in Chilean waters and to create awareness about their conservation needs.

The information collected through the sightings network evidence the critical conservation status of the population. Accordingly, the IWC first discussed to include this species in the Agenda of the Conservation Committee in 2007<sup>53</sup>; in 2008 IUCN classified the Chile-Peru population as critically endangered<sup>1</sup>; the Ministry of Foreign Affairs held a workshop on the southern right whale population of Chile-Peru<sup>54</sup>, prior to the Scientific Committee meeting in Santiago de Chile in 2008; and the IWC Scientific Committee decided to conduct a revised assessment of southern right whales that will be focusing on stock-specific variability of their recovery in historic and current breeding areas<sup>55</sup>. This workshop will be held in September 2011<sup>44</sup> and at the 63<sup>rd</sup> annual meeting, the South American populations of southern right whales have been nominated for a Conservation Management Plan.

The Law for the Protection of Cetaceans (Law 20.293 of 2008), includes national whale watching regulations that have special considerations for southern right whales. The regulation also institutionalizes a Cetacean Sighting Network under management of the Chilean Navy.

## 7 ACTIONS

The lack of scientific knowledge on the Southeast Pacific population of southern right whales make it very difficult to understand almost all aspects related to it such as distribution, movements, abundance and stock structures, among others. Also it makes it very difficult to assess the impacts of the current and potential threats. However, the few sightings and apparent no increase in abundance during the past 40 years has raised international concerns. Therefore, systematically and directed efforts need to be conducted to ensure the conservation of this Critically Endangered population.

### *7.1. Implementation of the Action Plan: Establishment of a Co-ordinator and Steering Committee*

The Action Plan must have a recognized, full-time co-ordinator, a Steering Committee and sufficient funding in order to ensure its effective implementation, monitoring and coordination among stakeholders. Stakeholders may include national authorities; national and international scientists; NGOs; local communities; artisan fishermen and fishing industry, among others.

## 7.2. Research Needs

At this stage, research priorities should be focused on the collection of sufficient scientific information to accurately assess the status of the population as a baseline for the future monitoring of the species and the effectiveness of the conservation management plan.

### 7.2.1 Development of a web-based platform to report southern right whale sightings

The long coast of Chile makes it difficult to conduct systematic monitoring of southern right whales. Since *E. australis* is a coastal species at their wintering breeding grounds, it is important to strengthen public participation in the reporting of sightings. Sighting networks have already shown to play a key role in this very important task<sup>56</sup>. However most of the time reporting is not done immediately after a whale is observed and so effective tracking of the individual is lost before any response can be coordinated. The development of a web-based platform that includes real-time reporting using internet and mobile technologies may facilitate the reporting and improve the response timing.

### 7.2.2 Baseline information

#### 7.2.1.1 Increase documentation of sightings and photo-identification of individuals

Two main tasks have been identified as a priority in the Action Plan: estimate abundance of the population and identify critical areas for breeding where concentration of southern right whales should occur.

The small number of sightings makes it difficult to use standard line transect methods to estimate abundance. The most sensitive approach in this case is the recording of each sighting with the active cooperation of different stakeholders. After a southern right whale is reported, directed and immediate efforts to photo-identify each sighting should take place.

Expanding the survey area to monitor a larger coastal area surrounding any individual sighting should be of great value to determine whether there are more individuals at the same time in a relatively same area.

#### 7.2.1.2 Start collection of genetic samples

There is a complete lack of information regarding population structure of Southeast Pacific southern right whales, numbers of whales remaining at its bottleneck ( $N_{min}$ ), or to which extend inbreeding depression may be preventing this population to increase. Genetic information is also a useful tool to estimate abundance of this population and also to understand the relation, if any, between individuals off the west coast of Chile-Peru, the Magellan Straits and other populations found in the Southwest Atlantic, Australia and/or New Zealand.

The development of a contingency plan to collect genetic samples whenever an individual is located should be considered as a priority.

#### 7.2.1.3 Identify threats and develop a GIS Database

It is critical to develop a GIS database that map areas with different sighting rates of the southern right whales along with current and potential threats. This will help to identify areas with risk for the conservation of the species and provide useful management advice.

#### 7.2.3 Monitoring

After baseline information is provided, a systematic and long term plan to monitor the status of the population, the current and potential threats, and the effectiveness of the conservation actions implemented should be implemented.

#### *7.3. General Stakeholder Involvement: Increase public awareness and capacity building along Chilean coast*

The collection of sound data on sightings of southern right whales depends on the knowledge that different stakeholders have about the species. Therefore, the production and distribution to key stakeholders of informative materials regarding species identification, conservation status, photo identification of individuals and regulations for the observation of the species, among others, is a key element.

The conduction of workshops on the species as well as developing a long-term strategy to create public awareness, including the use of massive national media, is essential to involve different stakeholders in the conservation of the Southeast Pacific population of southern right whales

#### *7.4. Legal Measures and Enforcement*

##### 7.4.1. Develop and implement contingency plan to afford maximum protection when a sighting is recorded

As with the mother and calf pair recorded in 2008 described in point 5.2, southern right whales sighted should be effectively protected from harassment and other anthropogenic threats when occurring near shore.

##### 7.4.2. Designation of areas for protection of the species.

The identification of sensible areas for the species in Chilean waters should be followed by the development and further adoption of proposals for the creation of protected areas that minimize anthropogenic impacts of the species and its marine environment.

### 7.4.3. Inclusion of Right Whale Conservation Considerations and Mitigation Measures in the Environmental Impact Evaluation and Permitting System for Large-Scale Coastal/Marine Projects

Coastal and marine large-scale development projects in Chile may cause negatively impacts in the population, such as habitat loss, marine degradation or even mortality events, among others. Whenever an area is known to be used by southern right whales, it is of high importance to consider its potential impacts and conduct an evaluation process to determine mitigation measures.

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