Management Plan for Antarctic Specially Protected Area No 134

CIERVA POINT AND OFFSHORE ISLANDS, DANCO COAST, ANTARCTIC PENINSULA

Introduction

This Area was originally designated as Site of Special Scientific Interest (SSSI) No 15 (ATCM Recommendation XIII-8, ATCM XIII, Brussels, 1985), after a proposal by Argentina, due to its great plant diversity and the fact that it has breeding colonies of at least ten species of birds.

During the XXI Antarctic Treaty Consultative Meeting (Christchurch 1997), the revised Management Plan for the Area was adopted in accordance with the format established by Annex V of the Madrid Protocol and as provided by Measure 3 (1997). During the XXV Antarctic Treaty Consultative Meeting (Warsaw 2002), and once Annex V entered into force, *Site of Special Scientific Interest* No. 15 was re-designated, by Decision 1 (2002), as *Antarctic Specially Protected Area* No. 134. The Management Plan was subsequently revised and at the XXIX Antarctic Treaty Consultative Meeting (Edinburgh, 2006), Measure 1 (2006) approved a new version of it. The Plan was again revised and the XXXVI ATCM (Brussels, 2013) approved the previous version through Measure 5 (2013), now superseded by the present version.

The original reasons for its designation are still valid and in recent years further reasons have made it even more significant. This area has great scientific value due to its unusual biodiversity, which includes numerous species of birds, flora, and invertebrates. The unique topography of the area, together with the abundance and diversity of vegetation, offers very favourable conditions for the formation of numerous microhabitats, which in turn favour the development of great biodiversity and give the Area exceptional landscape value.

At present, there is a need to increase the volume of studies related to the numbers and reproduction of seabirds and mammals, since they have the potential to be used as ecological indicators of processes on a global scale and of the environmental quality of the ecosystems (Costa et al, 2019; Croxall et al, 1998). In this regard, the geographical location of ASPA 134 is crucial for this type of study and other comparative studies between its fauna and that of other Antarctic areas. Climatic and oceanographic variability have been shown to have effects on seabird populations, generally with profound consequences, such as reduced breeding success and alterations in the mating cycles of some species (Chambers et al., 2011; Krüger et al., 2018; Warwick-Evans et al., 2021).

The Antarctic Peninsula region is one of the places on the planet where the greatest effects of global climate change have been observed, notably the direct impact on the formation and duration of sea ice and the consequent effects on the entire food chain (Morley et al., 2020; Turner et al., 2009). Recent studies indicate that the drivers of change in Southern Ocean ecosystems are causing, in the western region of the Antarctic Peninsula, increased temperatures, the loss of sea ice and increased potential for invasion of species, among other impacts (Morley et al., 2020). Specifically, some authors point out that the Cierva Point area has experienced the greatest warming in the entire peninsula (Wilhelm, Bockheim and Haus, 2016). Stability in the positive phase of the SAM (Southern Annular Mode) has had an impact on winds, water circulation and the extent of sea ice (Stammerjohn et al., 2008; Thompson and Solomon, 2002), and has repercussions for Antarctic flora and fauna.

In this context, ASPA 134 is an area that has suffered little disturbance, which allows comparative studies with populations that inhabit areas of frequent human disturbance (accumulation of refuse, pollution, tourism and fishing; Woehler et al., 2001, Patterson et al., 2008). In recent years there has been a trend towards increasing abundance of some populations that inhabit the ASPA, as is the case of penguins, in contrast to what is observed in other areas, where the frequency of human disturbance is correlated with the decrease in abundance of some populations (Woehler et al., 2001, Lynch et al., 2008, González-Zeballos et al., 2013). In the coming years we will also have to evaluate the effects of tourism as a source of disturbance of the ASPA and its possible effects on the populations of birds and mammals that inhabit it. It is also important to study in the ASPA the impacts of processes such as the increase in temperature, which has direct consequences in the increase of ice-free areas and the consequent formation of soils that are important in the dynamics of the area.

Its designation as an ASPA ensures that current long-term research programmes will not be adversely affected by accidental human interference, destruction of vegetation and soil, pollution of bodies of water, and disturbance of birds, especially at times that coincide with breeding periods.

Various Antarctic programmes are currently conducting research projects in this ASPA. Among others, the main scientific interests include the study of the population dynamics of penguin colonies and their reproductive chronology. The presence of marine debris and microplastics in the study colonies and species are also monitored. Other projects study glacier retreat and soil formation processes in the region. A topic of interest is also the inventory of the different types of wetlands present in Cierva Point in addition to their characterisation and monitoring over time. Studies are carried out on the richness of species and communities of algae and phytoplankton, as well as the flora present.

There are also several projects studying the effects of climate change on seal populations and seabird species. For example, work is being conducted on *Arctocephalus gazella, (the Antarctic fur seal) Leptonychotes weddellii (Weddell seal) and Hydrurga leptonyx (leopard seal),* studying the relationship with the ice cover in the area and global phenomena such as the El Niño Southern Oscillation (ENSO) through the evaluation of the impact of these predators on marine resources, their feeding strategies and their relationship with the availability of prey. Variations in various population parameters of birds exposed to different local conditions are studied with respect to the trophic biology of Antarctic birds with obvious global warming effects, analysing their responses to the changes observed. Finally, it is worth mentioning the studies carried out on permafrost dynamics in the area.

1. Description of values to be protected

The coastal area is home to a significant number of bird colonies, breeding colonies of marine mammals, and extensive vegetation. The coverage of lichens, mosses and grass-dominated communities is very extensive in Cierva Point. The values of the Area are associated with its high degree of biological diversity in flora and fauna and its topographical features, as well as a high landscape value. The coastline is very abrupt and the rocky intertidal zone is limited. The area is rich in species of both animals and vegetation, and in some cases their abundance is exceptional. The great diversity in relief and coastal forms and the extensive and varied vegetation cover offer a scenic diversity that is unusual in the Antarctic, giving it great landscape value, which is one of the reasons why it was designated an Antarctic Specially Protected Area (Santos, 2014). In general, there are 12 species of birds nesting in the area, some 18 species of mosses, 70 lichens, 2 liverworts and about 20 species of fungi.

Although Antarctica is considered one of the few uncontaminated areas of our planet because it is relatively isolated and distant from large industrial and urban centres, there is evidence of an excessive presence of pollutants in the north of the peninsula in the recent detection of substances associated with human activity in places that should be considered intact (Olalla, Moreno & Valcárcel, 2020).

For all the above reasons, its particular geographical location in the Northwest of the Antarctic peninsula gives this ASPA and the numerous scientific research programmes that are developed in the area a crucial importance in order to explain, at least partially, alterations in the Antarctic ecosystems as a result of climate change and/or human disturbance.

According to Morgan et al., (2007), ASPA 134 represents the environmental domain "Antarctic Peninsula mid-northern latitudes geologic" and according to Terauds et al., (2012) the area is in the "Northwest of the Antarctic Peninsula" biogeographic region. Also according to "Important Bird Areas in Antarctica 2015" (Harris et al., 2015), Cierva Point and offshore islands (Map 4 - Figure 7) constitute IBA ANT081.

For more details on the characteristics of the area, please refer to point 6 of this document.

2. Aims and objectives

The management of ASPA 134 aims to:

- Preserve the natural ecosystem and prevent unnecessary human disturbance.
- Allow the development of any scientific research providing it does not endanger the values of the area.
- Avoid major changes in the structure and composition of the flora and fauna communities.
- Conserve the flora of the area as reference organisms, free of human impact.
- Prevent or minimise the introduction into the Area of non-native plants, animals and microbes.
- Minimise the possibility of introduction of pathogens that can cause disease in wildlife populations within the area.
- Prevent the introduction, production or dissemination of chemical pollutants that may affect the area.
- Protect the biodiversity of the Area, avoiding major changes in the structure and composition of the fauna and flora communities.
- Prevent unnecessary human disturbance.
- Allow the development of scientific research that cannot be carried out elsewhere, and the continuity of ongoing long-term biological studies established in the area, as well as the development of any other scientific research providing it does not compromise the values on account of which the Area is protected.
- Avoid or minimise the unintentional introduction of seeds, plants, animals or microbes, as well as pathogens that could potentially be harmful to the fauna and flora.
- Allow the development of studies and monitoring tasks to estimate the direct and indirect effects of the activity of the nearby scientific base (Primavera Base).

3. Management Activities

The following management activities will be carried out to protect the values of the area:

- The personnel assigned to Primavera Base (Argentina) and in particular, the personnel authorised to enter the ASPA, will be specifically instructed on the terms and conditions of the Management Plan.
- Copies of the Management Plan for this area will be provided at Primavera Base.
- Movement will be restricted to sectors without vegetation, avoiding proximity to fauna except when the scientific projects so require and if the corresponding harmful interference permits have been obtained.
- Distances from fauna must be respected, except when the scientific projects require otherwise and providing the relevant permits have been issued.

- Collection of samples will be limited to the minimum required for approved scientific research plans.
- Inspection visits will be made to ensure that the management and maintenance measures are adequate.
- All signs, as well as other structures erected in the Area for scientific or management purposes, must be adequately secured and maintained in good condition.
- Pedestrian paths to research sites may be marked in order to limit circulation.
- In accordance with the requirements of Annex III to the Protocol on Environmental Protection to the Antarctic Treaty, any equipment or material abandoned or no longer used must be removed providing its removal does not adversely affect the environment.
- The Management Plan must be reviewed not less than once every five years and updated if necessary.
- All those responsible for aircraft operating in the area must be informed of the location, limits and restrictions that apply to entry and overflight of the area.
- Preventive measures will be implemented to avoid the introduction of non-native species and to control the eradication of the introduced species *Poa pratensis* (blue grass) which is no longer in the ASPA.
- In accordance with Resolution 5 (2019), the Primavera Base staff and all researchers visiting the ASPA will be reminded of the prohibition on using personal care products that contain plastic microbeads.
- The necessary visits will be made (at least once every five years) to determine whether the Area continues to serve the purposes for which it was designated and to ensure that management and maintenance measures are adequate.
- National Antarctic programmes operating in the region must consult with each other to ensure the implementation of the above provisions.

4. Period of Designation

Designated for an indefinite period.

5. Maps

Map 1 (Figure 4) shows the general location of ASPA 134. Map 2 (Figure 5) shows the ASPA in relation to the Danco coast. The set of areas that make up ASPA 134 are shaded (the subtidal marine environment between the various continental and island sectors is not included in the ASPA). Map 3 (Figure 6) shows in detail the area around Primavera Base (excluded from ASPA 134). Map 4 (Figure 7) shows in detail the sectors included in ASPA 134, the boundaries of IBA ANT081 and the general location of the various bird colonies within the ASPA.

6. Description of the Area

6(i) Geographical co-ordinates, limits and natural features

Cierva Point (64°10'1.05"S, 60°56' 38.06"W) is located on the south coast of Cierva Cove, to the north of Hughes Bay, between the Danco and Palmer coasts, in the north-western sector of the Antarctic Peninsula. The site comprises the ice-free area between the southwest coast of Cierva Cove and the northeast coast of Santucci Cove. Also included are Apéndice Island (64°11'41.99"S, 61°1'3.25"W) and José Hernández Island (64°10'10.06"S, 61°6'11.34"W) and the Moss (64°10'2.22"S, (61°1'49.43"W) and Penguin (64°8'35.90"S, 60°59'11.43"W) Islands (Table 1), which are to the west/southwest of Cierva Point. Although the intertidal zone of each of these areas is included in the Area, the subtidal marine environment is not. The Primavera Base (Argentina)

and its associated facilities, as well as the beach area used as access to it, are excluded from the Zone.

Table 1: summary of the coordinates of the localities included in the ASPA.

Localidad	***Latitud***	***Longitud***
Punta Cierva	64° 10' 1.05"S	60° 56' 38.06"O
Ite. Pingüino o Mar	64° 8' 35.90"S	60° 59' 11.43"O
Ite. Musgo	64° 10' 2.22"S	61° 1' 49.43"O
I. José Hernández	64° 10' 10.06"S	61° 6' 11.34"O
I. Apéndice	64° 11' 41.99"S	61° 1' 3.25"O

6(ii) Natural features

The Area is rich in species of both animals and vegetation, and in some cases their abundance is exceptional. The Area also has great landscape value due to the diversity of relief and coastal forms, the presence of different kinds of rock and a marked fracture system. Added to the above is an extensive and varied vegetation cover that results in a scenic diversity that is unusual for the Antarctic area.

Cierva Point shows a relatively simple structural design. It is dominated by three summits: The Mojón, Escombrera and Chato hills, aligned in an east-west direction, defining a with steep, South-facing hillside slopes, permanently covered by snow, and the other hillside a moderate to gentle North-facing slope, free of snow during summer. On the latter slopes we observe abundant vegetation, with areas of continuous coverage of bryophytes (liverworts, hornworts and mosses) and associated lichens, and also numerous species of birds, including the settlement of a colony of Gentoo penguins (*Pygoscelis papua)* (Novatti, 1978, Agraz et al., 1994). These features give the area exceptional scientific and aesthetic value.

In previous studies, Agraz et al., (1994) divided Cierva Point into two environmental zones according to the type of substrate and vegetation cover, (1) rocky wall (or coastal zone) and (2) exposed hillside. The rocky wall is a coastal strip with steep slopes, a rocky surface with scree of different sized pieces. In some sectors this substrate is unstable and is crossed by numerous canyons. Most of it is snow-free during the southern summer. The vegetation is very sparse, with lichens and grasses. There are many natural cavities between the rocks. This first zone constitutes the nesting site of five bird species. The second, the exposed hillside, comprises a great variety of environments and features from the coast to the peaks. The slopes are moderate to steep and the rocks of variable size, some loose and some cohering, and the surface is free of ice during the southern summer season. The high areas have glaciers that give rise to numerous little streams in summer. These feed the lower areas, where there is the greatest development of vegetation.

Weather

Long-term meteorological data is not available for the site since there is no permanent weather station installed. However, Quintana (2001) recorded meteorological data at Cierva Point during the summer of 1992/93 with an average monthly temperature that varied from 1.8°C to 2.2°C, while the relative humidity averaged 79% and the average wind speed was 7.9 kph. General data indicate that the maximum and minimum temperatures range between 13 and -20ºC. Such winds as it was possible to record came mainly from the northwest, with an average speed of 45 kph. According to Wilhelm et al., (2016), the climate is cold marine, with an average annual air temperature of approximately -3.2°C and annual precipitation ranging between 400 and 1,100 mm. Winter snow depth may exceed 1 m. However, most of the seasonal snow melts completely during the summer. The study area generally slopes towards the north, exposing it to high inputs of solar radiation during the summer (Wilhelm, Bockheim & Haus, 2016).

Regarding the expected climate change for the area, although there are no specific data, according to Turner et al., (2005) air temperatures over the West Antarctic Peninsula have increased at a rate of 0.56ºC per decade since the 1950s. These increases in temperature have caused a rapid retreat of the glaciers and the consequent exposure of the soil. Surface temperature trends show significant warming in the Antarctic Peninsula and, to a lesser extent, in West Antarctica since the early 1950s, with little change in the rest of the continent. The greatest warming trends occur in the western and northern parts of the Antarctic Peninsula, an area that includes the Cierva Point area. Some data indicate a warming of +0.20°C per decade, and also indicate that the warming of the western peninsula has been greater during the winter, with winter temperatures that increased by +1.03°C per decade from 1950 to 2006.

Geology and soils

The bedrock at Cierva Point is of intrusive igneous origin. The northernmost lowlands are made up of granodiorite with very large dolerite xenoliths (> 1 m). The centre of the peninsula (uphill and to the south) is dominated by crystallised orthoclase feldspar granites. Both granitoid regions contain dolerite dikes. The contact region between the granodiorite and granite shows signs of contact metamorphism. The eastern side of the peninsula, along with the southern peaks, is dominated by basalts containing olivine and quartz crystals.

The polished bedrock striations and chatter marks on bedrock throughout the peninsula indicate that at one time nearly the entire region was glaciated. Based on the current position of the glacier, it is likely that the entire slope was glaciated as recently as a couple of hundred years ago. Currently, most of the peninsula is ice-free. However, the eastern part is dominated by a large, rapidly retreating glacier. The terrain of Cierva Point is rugged, dotted with several natural terraces. Slopes vary from 0 to 20% on banks and from 30 to 60% on rocky cliffs. The terraces contain several permanent ponds and unconsolidated materials with soils derived from the eroded bedrock. These terraces are occupied during much of the year by Gentoo penguins (*Pygoscelis papua*).

Regarding the soils of the ASPA, most information is related to Cierva Point. Wilhelm, Bockheim & Haus (2016) described 27 soils grouped into four soil categories: acidic (pH <5), neutral (pH >5), dominated by moss (high accumulations of organic matter) and ornithogenic (high accumulations of phosphorus). The neutral soils are newly formed and have undergone the least development. They are also located closest to the edge of the glacier. Acidic soils are located furthest from the edge of the glacier, allowing more nutrient leaching to occur. These soils have extremely low pH values (as low as 3.5) but do not have the high accumulations of phosphorus found in ornithogenic soils or the high soil carbon content found in moss-dominated soils. In a region with rapidly retreating glaciers such as the Antarctic Peninsula, proximity to the edge of the glacier becomes an important factor in determining soil properties. Soils furthest from the glacier have had more time to be affected by leaching, penguin activity, and moss build-up.

The soils of the banks occupied by penguins are considered ornithogenic, due to the large number of nesting sites found in the region. The characteristics of ornithogenic soils include high accumulations of P and Ca and extreme acidity. Ornithogenic soils are generally found in regions where penguins can nest and have easy access to food, such as low elevation sites that are far enough inland that guano deposits are not easily washed away (Wilhelm, Bockheim & Haus, 2016).

Some of the thickest moss layers on record on the Antarctic Peninsula are found at Cierva Point. Moss-dominated soils are distinguished by dark horizons with rich accumulations of soil organic matter, especially on the surface (Wilhelm, Bockheim & Haus, 2016).

Regarding permafrost, Ramos Marín (2018) mentions that for Cierva Point the upper part of the permafrost is observed at depths of 0.4, 1 and 5 m and the temperature at these depths is -1.4 ºC, -2.6ºC and 1.2ºC in these places. In the places where the upper part of the permafrost is reached, it is estimated that the depth of the upper part of the permafrost ranges between 0.4 and 5 m with

temperatures between -0.2ºC and -2.6ºC. Ramos Martín (2018) mentions that if there were a 1°C increase in the average temperature, close to 50% of the current permafrost in the area would disappear, and concludes that degradation of the permafrost in Cierva Point can generate significant impacts on the local ecosystem.

Flora and fauna

The flora is very abundant and is located in both wet and dry areas. Mosses dominate in wet areas in the form of carpet cover (*Drepanocladus uncinatus*) and turf (*Polytrichum alpestre*). Dry places, on the rocks, are dominated by lichens of the *Usnea* and *Xanthoría* genera. *Deschampsia Antarctica* grass is also abundant.

The cover of mosses, lichens and grasses is very extensive. The most conspicuous plant communities are the associations of dominant lichens, moss turf dominated by *Polytrichum alpestre* and *Chorisodontium aciphillum* and the *Deschampsia colobanthus* subformation. The moss turf covers areas of more than one hundred square metres, with an average depth of about 80 cm. The flora present includes the two Antarctic species of flowering plants, about 18 species of mosses, about 70 of lichens, two liverworts, as well as about 20 species of fungi. Non-marine microalgae, especially in the Moss and Penguin Islands, are very abundant and with unusual records. Terrestrial arthropods (spiders, scorpions, etc.) are also very numerous, sometimes associated with the tidal trenches present in the coastal part of the Area.

A relevant piece of information is the record of a non-native grass, *Poa pratensis* (blue grass). It was inadvertently introduced in Cierva Point during transplantation experiments with the *Nothofagus antarctica* and *N. pupilo* beech varieties between 1954-1955 (Ross et al., 1996, Corte 1961, Smith 1996); starting in 1995, there was an increase in the coverage area of this species. Its expansion was probably due to the environmental changes that occurred in the area. After conducting studies on *Poa pratensis* and the communities with which it was associated, a decision was made on the eradication strategy that would generate the least impact on the ecosystem (see Information Document 13, presented at ATCM XXXV).

In summary, the description of the colonisation status of the non-native plant *Poa pratensis* and the subsequent eradication process is considered in ATCM XXXV IP 13 Colonisation status of the non-native grass *Poa pratensis* at Cierva Point, Danco Coast, Antarctic Peninsula, ATCM XXXVI IP 35 Non-native grass *Poa pratensis* at Cierva Point, Danco Coast, Antarctic Peninsula - Ongoing investigations and future eradication plans and ATCM XXXVIII IP 29 Successful eradication of *Poa pratensis* at Cierva Point, Danco Coast, Antarctic Peninsula.

Finally, during the 2014-2015 southern summer an eradication of the exotic plant was carried out at Cierva Point. More than 500 kg of soil and plant material were extracted during the operation. Then, a year later, in February 2016, a follow-up of the eradication was carried out, where no regrowth of non-native plants was observed. Instead, some small shoots of native Antarctic grass *Deschampsia antarctica* were found at the base of the platform where the non-native plant used to be (Pertierra et al., 2017). These observations allowed it to be concluded that there has been some regeneration of the natural community and that there was no resurgence of *Poa pratensis* from plants not completely extracted and that the presence of a seed bank seems unlikely (Pertierra et al., 2013).

In relation to the site flora, Santos (2014) mentions that the coverage of mosses, lichens and grasses is very extensive. The most conspicuous plant communities are the lichen associations, the moss turf, dominated by *Polytrichum-Chorisodontium* and the subformation of *Deschampsia-Colobanthus*, which cover areas of more than one hundred square metres, with an average depth of 80 cm. At the microalgae level, a total of 61 species have been recorded. The best represented groups are Cyanobacteria (22 species) and Chlorophyta (28 species), the latter largely dominated by flagellate forms. In general, the largest islands (Moss and Penguin) have a high overall species richness (29 and 36 species, respectively) (Mataloni & Pose, 2001).

Regarding marine mammals, the waters around the coasts of ASPA 134 are visited annually, particularly during the summer months, by numerous specimens of whales and seals. Among the recorded cetaceans is the Humpback Whale (*Megaptera novaeangliae*), for which around 40 individuals, including juveniles and offspring, have been identified in a single season (January and February) from the colouration patterns of the ventral face of the tail fin or tail. Also, more than 15 Antarctic Minke whale individuals have been identified in these waters through distinctive characteristics of their dorsal fins (*Balaenoptera bonaerensis*). Groups of killer whales (*Orcinus orca*) have also been observed in these waters, consisting of up to 13 individuals. All these species have been observed occupying both the coves present in the area (Cierva, Santucci and Escondida) as well as in the waters surrounding the islands that are part of the ASPA.

Regarding seals, specimens of Weddell seal (*Leptonychotes weddellii*), Antarctic fur seal (*Arctocephalus gazella*), southern elephant seal (*Mirounga leonina*) crabeater seal (*Lobodon carcinophaga*) and leopard seal (*Hydrurga leptonyx*) have been observed. The three species mentioned are abundant during the southern summer since they find the necessary conditions (unobstructed coasts with sheltered beaches and/or large drifting icebergs in calm waters) for moulting. The studies carried out by the marine mammal programme of the IAA (Argentine Antarctic Institute) have shown that these species frequent the site annually, with confirmed presence in the area for the last 16 consecutive years (Javier Negrete, unpublished data).

In turn, the tagging and recapture programme carried out over the last 10 years has confirmed that both Weddell seals and leopard seals exhibit a high degree of fidelity to this same site, some specimens having been seen to return year after year (Meade et al., 2015, Negrete et al., 2014). This leopard seal population has distinctive eating habits since several specimens found there consume a large percentage of krill (Botta et al., 2018, Guerrero et al., 2014, 2016, Rogers et al., 2014). Considering the high frequency of cetaceans (whales) in the area and the patterns of habitat use by seals, which show that these animals spend much of their time feeding in the water or shedding their fur on the ice floes (Bobinac et al., 2014 and Javier Negrete, in preparation), it is vital that in the near future the marine sector be considered within the protected area, even more so if one takes into account that the increase in tourist ships visiting the area and the number of vessels that deploy once arrived could cause disturbances and/or accidents to these animals.

Regarding the presence of birds in the ASPA, studies have shown that 10 species of birds nest there: Chinstrap Penguin (*Pygoscelis antarctica*), Gentoo Penguin (*P. papua*), Southern Giant Petrel (*Macronectes giganteus*), Cape Petrel (*Daption capense*), Wilson's Storm Petrel (*Oceanites oceanicus*), Blue-eyed shag (*Leucocarbo atriceps bransfieldensis*), Antarctic Shag (*P. bransfieldensis*), Pale-faced Sheathbill (*Chionis alba*), Skuas (predominant species *Catharacta maccormicki*), Kelp Gull (*Larus dominicanus*) and Antarctic Tern (*Sterna vittata*) (Gonzalez et al., 2013). The most numerous colonies correspond to those of Chinstrap Penguins (*Pygoscelis antarctica)*, Gentoo Penguins (*P. papua)*, Wilson's Storm Petrels (*Oceanites oceanicus)*, Polar Skuas (*Catharacta maccormicki)* and *K*elp Gulls (*Larus dominicanus).* According to the latest available surveys, the ASPA colonies (especially those of penguins) show increasing population trends. This situation highlights the importance of the protected area for the protection of its natural values.

The status of seabird populations may provide valuable indicators of the conditions of their foraging and nesting environments in relation to global processes. González et al., (2013) indicate that climate and oceanographic variability and changes have been shown to affect seabirds, often with profound consequences, such as reduced reproductive success and altered reproduction cycles in some species. Specifically, in the case of the ASPA, it has been shown that the area has a high richness of species, both animals and plants, but that the greatest abundance of birds, mainly penguins, is within it. In this regard we can start with the colonies of *Pygoscelis papua* (Gentoo Penguin), which is the most abundant in the ASPA. Table 2 and Figure 1 show that the population is experiencing an increasing trend over time, as is its distribution range.

Table2: Number of breeding pairs per site for Pygoscelis papua (data extracted from González-Zeballos et al., 2013).

Publicación	*Novatti (1978)*		*Poncet & poncet (1987)*	*Quintana et al (1998)*		*Favero et al (2000)*	*Gonzalez Zeballos et al (2013)*	*Juarez (2021)**
Año	1954	1958	1984-1987	1991	1996	1998	2011	2019
Punta Cierva	559	614	600	800	1041	593	2680	7000
Isla Apéndice			450			905	2795	
Total ZAEP	559	614	1050	800	1041	1498	5475	7000
* Datos aproximados del tamaño de las colonias de la ZAEP aún no publicados.								

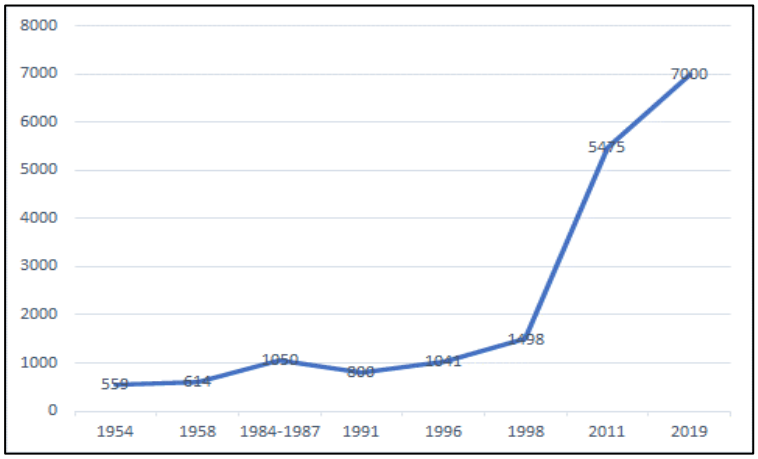

Figure1: time series of the number of Pygoscelis papua breeding pairs for the ASPA. (data extracted from González-Zeballos et al., 2013).

Table3: Number of Pygoscelis antarctica (Chinstrap Penguin) breeding pairs per location. (data extracted from González-Zeballos et al., 2013).

Publicación	*Muller-Schwarze (19759*	*Poncet & poncet (1987)*	*Favero et al (2000)*	*Gonzalez Zeballos et al (2013)*	*Juarez (2021)**
Año	1971	1984-1987	1998	2011	2019
Ite. Pingüino o Mar		500	1553	2763	
I. José Hernández	2060	200	546	180	4000
I. Apéndice		1100	152	33	
Total ZAEP	2060	1800	2251	2976	4000
* Datos aproximados del tamaño de las colonias de la ZAEP aún no publicados.					

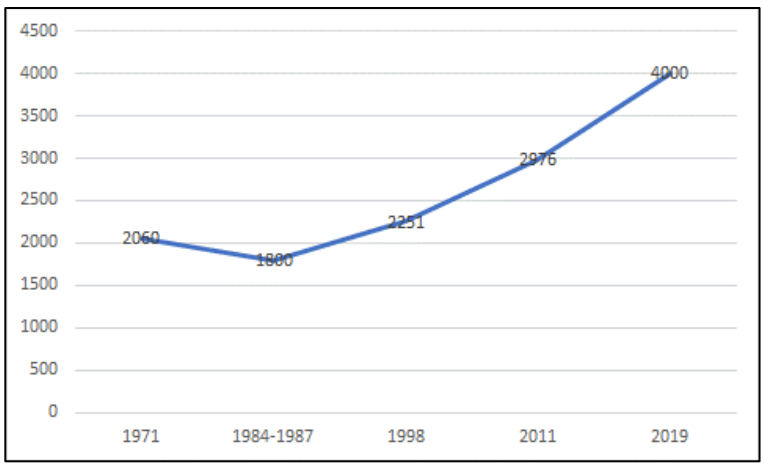

Figure2: Time series of breeding pairs per site for Pygoscelis antarctica. (data extracted from González-Zeballos et al., 2013).

For *Pygoscelis antarctica* (Table 3 and Figure 2), the time series has also registered an increasing trend in the population size of the total number of breeding pairs present in the ASPA. In this specific case, Table 2 shows that although the Penguin or Mar Island colony shows a significant increasing trend, the other colonies are decreasing in number. It will be important in the coming years to determine the causes of this phenomenon. Regarding the other species of seabirds, table 4 and figure 3 show the sites where they are present in the ASPA and the latest data on the number of breeding pairs. According to the latest records, most of them are increasing in population, however, work is being done to have current records to accurately assess the state of the colonies present.

Table4: Number of breeding pairs by species and locality. PB: Antarctic Shag (Phalacrocorax bransfieldensis), MG: Southern Giant Petrel (Macronectes giganteus), DP: Cape Petrel (Daption Capense), CA: Pale-faced Sheathbill (Chionis alba), SM: Sout Polar Skua (Stercorarius maccormicki), LD: Kelp Gull (Larus dominicanus), SV: Antarctic

Especie	PB		MG		DP		CA		SM		LD		SV	
Año	1997-98	2010-11	1997-98	2010-11	1997-98	2010-11	1997-98	2010-11	1997-98	2010-11	1997-98	2010-11	1997-98	2010-11
Punta Cierva	0	0	0	0	7	3	2	1	145	166	158	73	45	57
Ite. Pingüino o Mar	0	0	0	0	1	0	3	1	3	3	8	10	0	3
Ite. Musgo	0	0	35	42	28	17	3	4	10	26	120	70	15	19
I. José Hernández	21	21	0	0	0	0	1	1	0	17	15	9	35	11
I. Apéndice	0	0	5	41	23	11	1	2	2	12	68	12	15	12
Total ZAEP	21	21	40	83	59	31	10	9	160	224	369	174	110	102

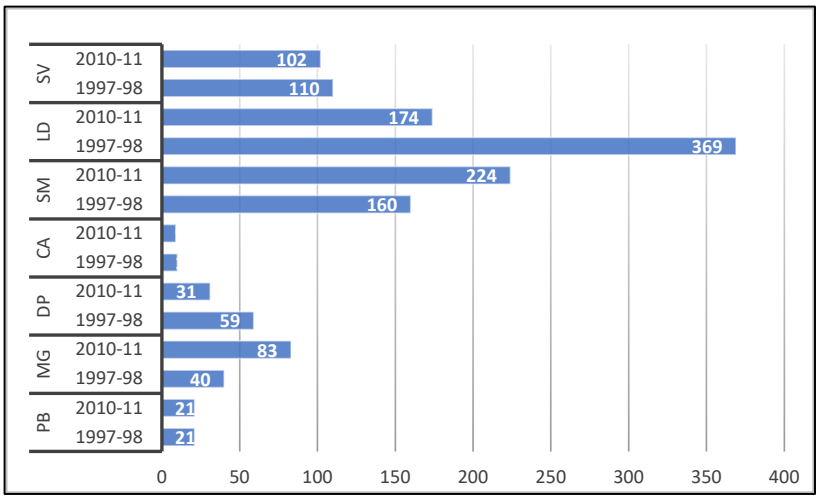

Figure3: comparison of the number of breeding pairs by species and locality. PB: Antarctic Shag (Phalacrocorax bransfieldensis), MG: Southern Giant Petrel (Macronectes giganteus), DP: Cape Petrel (Daption Capense), CA: Pale-faced Sheathbill (Chionis alba), SM: Sout Polar Skua (Stercorarius maccormicki), LD: Kelp Gull (Larus dominicanus), SV: Antarctic Tern (Sterna vittata) (data extracted from González-Zeballos et al., 2013).

Human Activities and Impact

One of the most significant human activities in the area is Tourism. The natural features of the area and the growth and diversification of tourism in the Antarctic continent position the Cierva Cove area among the 20 most visited and chosen sites by tour operators. Although access for

tourism and any other recreational activity is forbidden in the area covered by the ASPA, there has been an increase in tourists in the surrounding maritime area for a wide range of activities each year in the tourist season. Among the most popular activities are small boat cruises, kayaking, polar plunge, stand up paddleboarding, snorkelling and scuba diving.

To provide adequate protection to the values identified in the ASPA, visitors and the staff responsible for the tourist contingent must adequately follow the recommendations and limits of the management plan to avoid any interference or disturbance. Although the data are approximate according to IAATO statistics, an average of between 9,500 and 13,000 tourists have been registered in recent seasons in the Cierva Cove area near the ASPA, which represents a significant impact on the area.

6(ii) Access to the area

Access to the area must be on foot from the Primavera Base, and only for authorised exceptions. The adjacent islands will be accessed by smaller boats. This marine access is allowed at any point of the islands included in the Area. Access to the area through the beaches must be avoided whenever animal fauna is present, especially during the breeding season.

For more information see section *7(ii)*.

6(iii) Location of structures within and adjacent to the Area

Structures within the Area

There are no structures within the Area.

Structures adjacent to the Area

Adjacent to the ASPA; outside the limits of the Area is the Primavera Base (Argentina, 64º09'S, 60º58'W), located northwest of Cierva Point and adjacent to the Area. It is open only during the summer months. It consists of eight buildings and a delimited area for helicopter landing. The buildings are interconnected by walkways in order to avoid damage to the vegetation.

6(iv) Location of other protected areas in the vicinity

- *ASPA 152, Western sector of the Bransfield Strait (Mar de la Flota), off the coast of Low Island, South Shetland Islands, about 90 kilometres northwest of ASPA 134. It is located off the west and south coast of Low Island between 63°15'S and 63°30'S and between 62°00'W and 62°45'W.*
- *ASPA 153, Eastern sector of Dallmann Bay, off the west coast of Brabant Island, Palmer Archipelago, about 90 km west of ASPA 134. It is located between latitudes 64°00'S and 64°20'S and from 62°50'W eastward to the west coast of Brabant Island, (approximately 520 km^2).*

6(v) Special zones within the area

There are no special zones within the area.

7. Terms and conditions for entry permits

7(i) General permit conditions

Entry to the Area is prohibited except by permission issued by appropriate national Authorities.

The conditions for granting a permit to enter the Area are the following:

- *That entry is granted for a scientific purpose that cannot be carried out elsewhere and is consistent with the objectives of the Management Plan.*
- *The actions allowed do not harm the natural ecological system of the Area.*

- *That entry is granted for any management activity (inspection, maintenance or review), in support of the objectives of this Management Plan.*
- *The actions allowed are in accordance with this Management Plan.*
- *The Permit, or an authorised copy, is carried by the authorised principal investigator upon entering the Area.*
- *A post-visit report is provided to the competent National Authority mentioned in the Permit.*
- *Tourism and any other recreational activity is not allowed.*

7(ii) Access to and movement within or over, the Area

Any access to the Area will be possible through a permit granted by a competent authority, and will only be granted for activities that are in accordance with this Management Plan.

The only access for helicopters is outside the limits of the Area, in the area adjacent to Primavera Base. Helicopters can land only in the specified area east-south-east of the Base. The flight path to be used is limited to an approach and departure from/to the north. Aircraft shall overfly the Area, as a minimum standard, as established in Resolution 2 (2004), *Guidelines for the Operation of Aircraft near Concentrations of Birds*. As a general rule, no aircraft may fly over the ASPA at a height of less than 610 metres (2,000 feet), except in cases of an emergency or air safety. Movements within the Area will be carried out without disturbing the fauna and flora, especially during the breeding season.

No vehicles of any kind are allowed.

7(iii) Activities which may be conducted in the Area

- Scientific research activities that cannot be carried out in other places and that do not endanger the Area's ecosystem.
- Essential management activities, including monitoring.
- If access to certain nesting sites for birds and mammal colonies is deemed necessary for scientific or conservation reasons, it could include greater restrictions between late October and early December. This period is considered especially sensitive because it coincides with the egg-laying peaks of nesting birds in the Area.
- The use of RPAs (unmanned aircraft or drones) will not be allowed within the limits of the ASPA, unless previously analysed case by case during the environmental impact assessment process. They may only be used when stated in the entry permit and under the conditions established therein. During the analysis and authorisation process, all Antarctic Treaty directives in force will be taken into account.

7(iv) Installation, modification or removal of structures

No additional structures may be built or equipment installed within the Area, except for essential scientific or management activities and with proper permits.

Any scientific equipment installed in the Area, as well as any research signage, must be approved by permit and clearly labelled, indicating the country, name of the main researcher and year of installation. All materials installed must be of such a nature as to present a minimum risk of contamination in the Area, or of causing damage to vegetation or disturbance to fauna.

Research signage must not remain after the permit expires. If a specific project cannot be concluded within the time allowed, an extension must be requested authorising the permanence of any element in the Area.

7(v) Location of field camps

The Parties that use the Area will normally have the Primavera Base available for their accommodation, subject to prior coordination with the Argentine Antarctic Programme. The

installation of tents will be allowed only in order to house scientific instruments or material, or to be used as an observation base.

7(vi) Restrictions on materials and organisms that can be brought into the Area

- No live animals or plant material may be deliberately brought into the Area. All necessary recommendations against the intentional introduction of non-native species into the area must be adopted. In this regard, remember that these species are frequently introduced by humans. Clothing, personal equipment or scientific instruments and work tools can introduce insect larvae, seeds, spores, etc. For more information see the Non-Native Species Manual - CEP 2011.
- Uncooked farm products may not be introduced.
- No herbicides or pesticides may be brought into the Area. Any other chemical product, which must be introduced with the corresponding permit, will have to be removed from the Area at the end of the activity carried out with the appropriate permit. The use and type of chemical products must be documented in the best possible way for the knowledge of other researchers.
- Fuel, food and other materials must not be deposited within the Area unless they are required in an essential way by the activity authorised in the corresponding Permit.

7(vii) Taking of, or harmful interference with, flora and fauna

Any taking or harmful interference is prohibited, except in accordance with a Permit. When an activity authorised by a permit involves taking of or harmful interference with flora or fauna, it must be consistent with the *SCAR Code of Conduct for the Use of Animals for Scientific Purposes in Antarctica* as a minimum standard.

Information on the taking of and interference with flora and fauna will be duly exchanged through the Antarctic Treaty Information Exchange System and its record must be incorporated, at least, in the *Antarctic Master Directory* or, in Argentina, in the *National Antarctic Data Centre*.

Scientists taking samples of any kind must consult the Antarctic Treaty Electronic Information Exchange System (EIES) and/or contact the corresponding national Antarctic programmes that may be involved in taking samples in the Area, in order to minimise the risk of possible duplication.

7(viii) Collection or removal of materials not brought into the Area by the permit holder

Any material from the Area may be collected or removed from the Area only with the proper Permit. The collection of dead specimens for scientific purposes must not exceed a level such that it deteriorates the nutritional base of local scavenger species. The latter depends on the species to be collected and, if necessary, expert advice will be requested prior to granting of the permit.

7(ix) Disposal of waste

Any non-physiological waste must be removed from the Area.

In the case of sewage and domestic liquid waste, the sanitary facilities of the Primavera Base (Argentina) will be available, provided that it is open. In the case of tasks being carried out on the adjacent islands, waste water may be discharged into the sea in accordance with the provisions of Article 5 of Annex III to the Madrid Protocol.

Waste resulting from research activities in the Area may be temporarily stored at Primavera Base, pending removal. Said storage must be carried out in accordance with the provisions of Annex III to the Madrid Protocol, marked as waste and duly closed to avoid accidental leaks.

7(x) Measures that may be necessary to continue to meet the aims and objectives of the Management Plan

Permits to enter the Area may be granted for biological monitoring and inspection activities, which may include the taking of samples of vegetation or animals for research purposes as well as the erection and maintenance of signs or any other management measure. All structures and markings installed in the Area for scientific purposes, including signs, must be approved in the Permit and clearly identified by country, indicating the name of the main researcher and year of installation.

7(xi) Requirements for reports on visits to the Area

The main holder of the Permit must submit a report on the tasks carried out in the Area using the format previously delivered together with the Permit. This must be done for each Permit and once the activity has ended. This report must be sent to the permitting authority.

The records of permits and post-visit reports related to the ASPA will be exchanged with the other Consultative Parties, as part of the Information Exchange System, as established in Art. 10.1 of Annex V.

The permits and reports must be filed for free access by any interested Party, SCAR, CCAMLR and COMNAP, in order to provide the necessary information on human activities in the Area to ensure proper management.

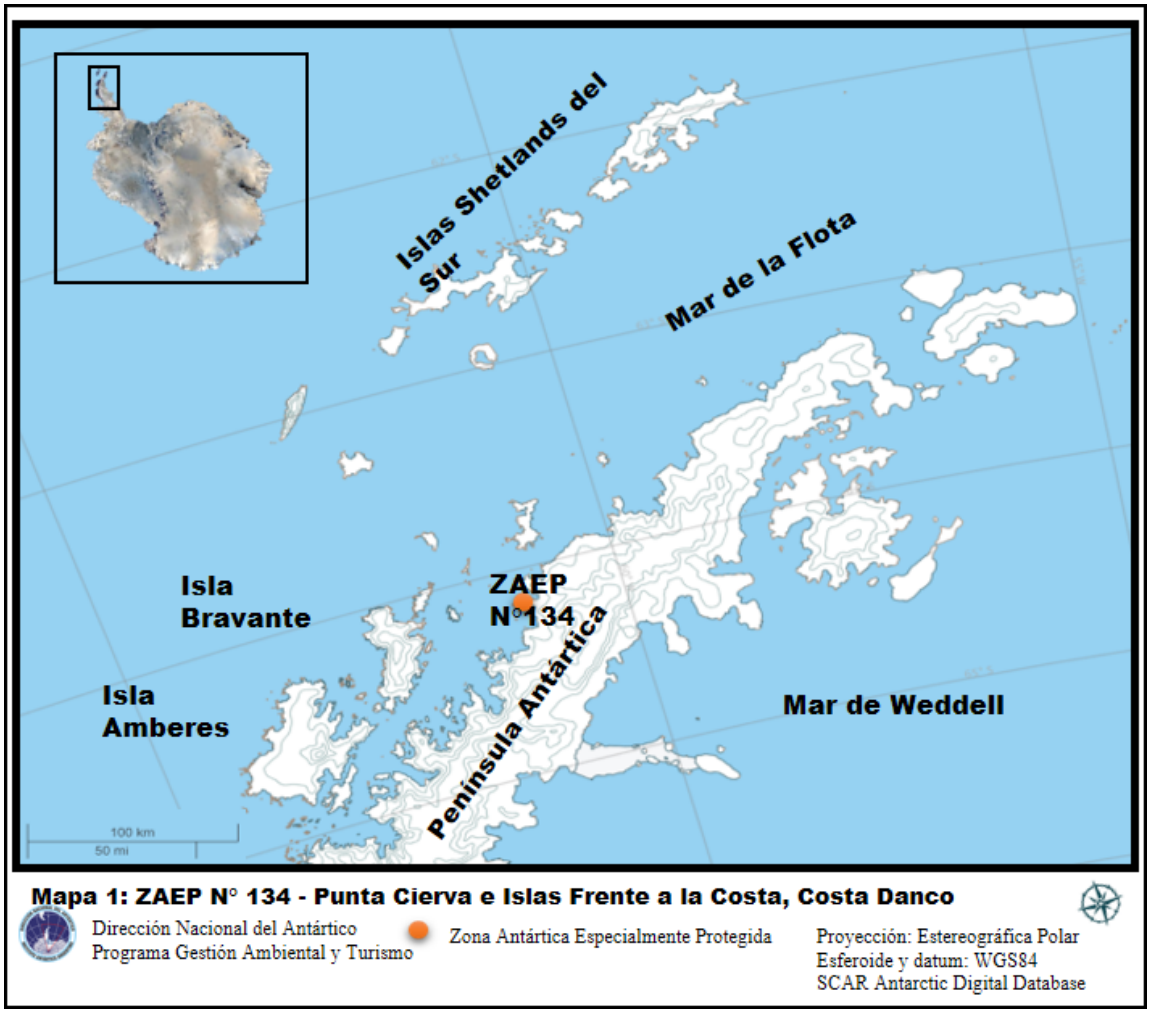

Figure 4: General location of Antarctic Specially Protected Area No. 134, Cierva Point and Offshore Islands, Danco Coast, Antarctic Peninsula.

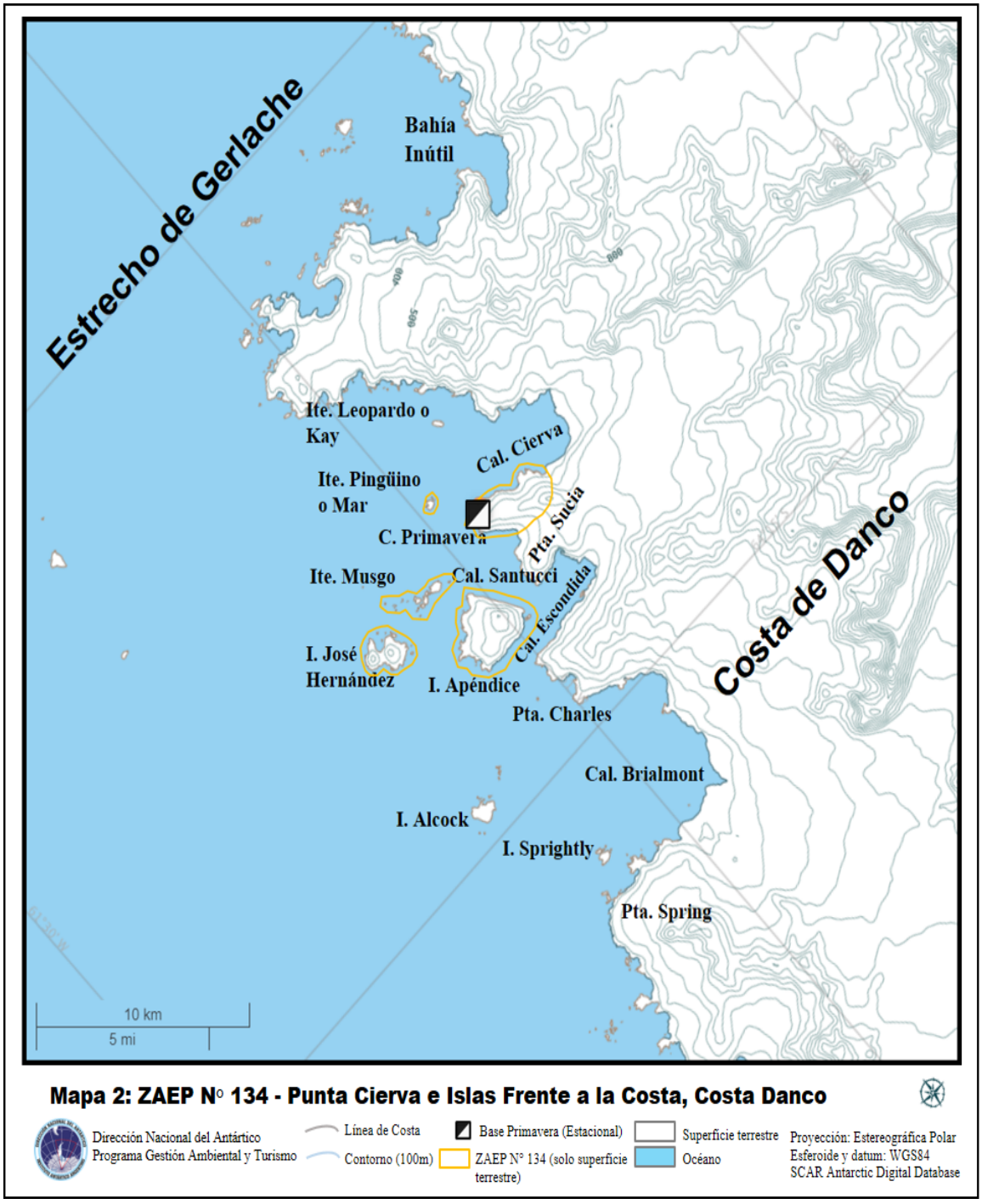

Figure 5: Antarctic Specially Protected Area No. 134, Cierva Point and Offshore Islands, Danco Coast, Antarctic Peninsula. The set of areas that make up ASPA 134 are shaded (the subtidal marine environment between the various continental and island sectors is not included in the ASPA).

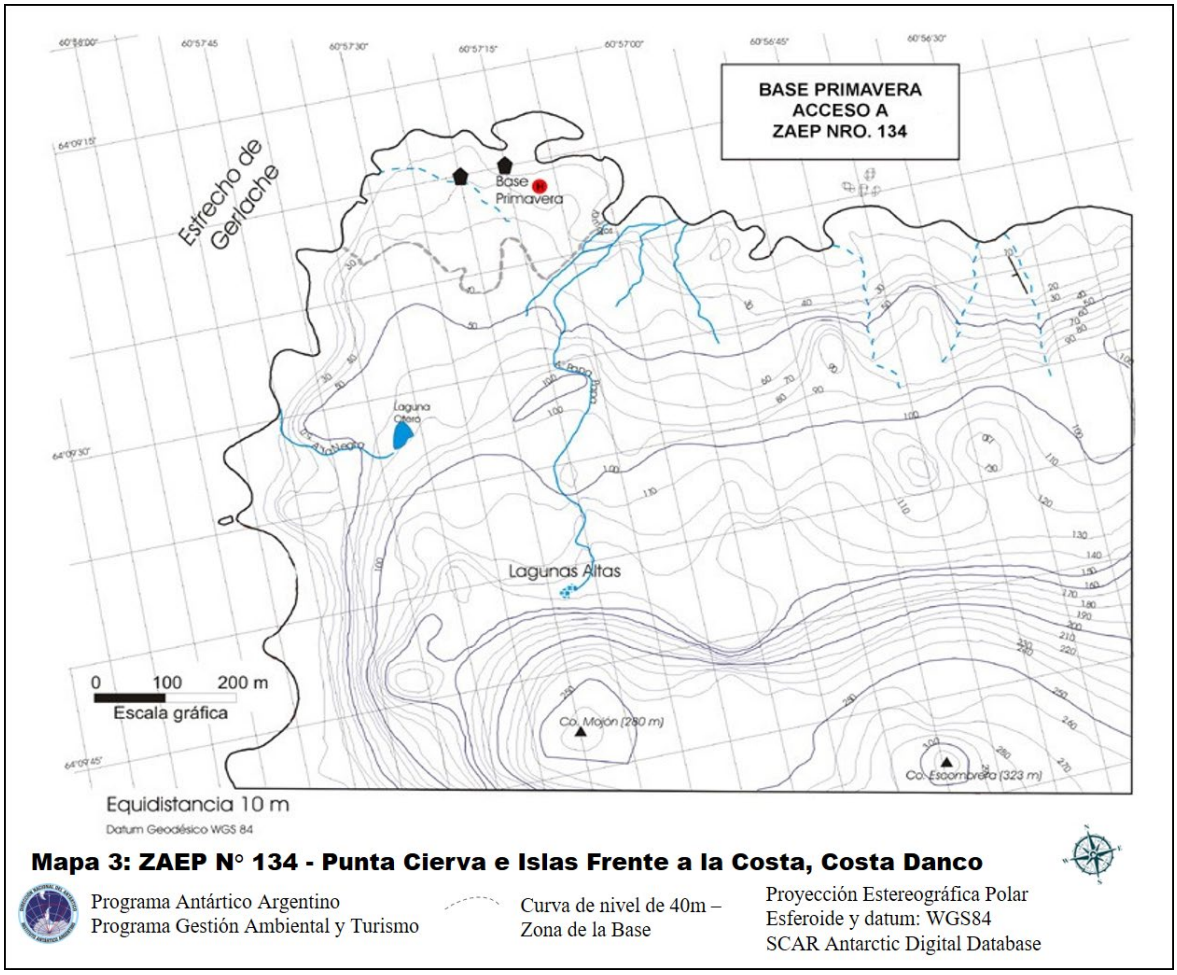

Figure 6: Cierva Point sector that includes the Primavera Base (the grey dotted line on the 40 m contour line indicates the area of the base, excluded from ASPA 134).

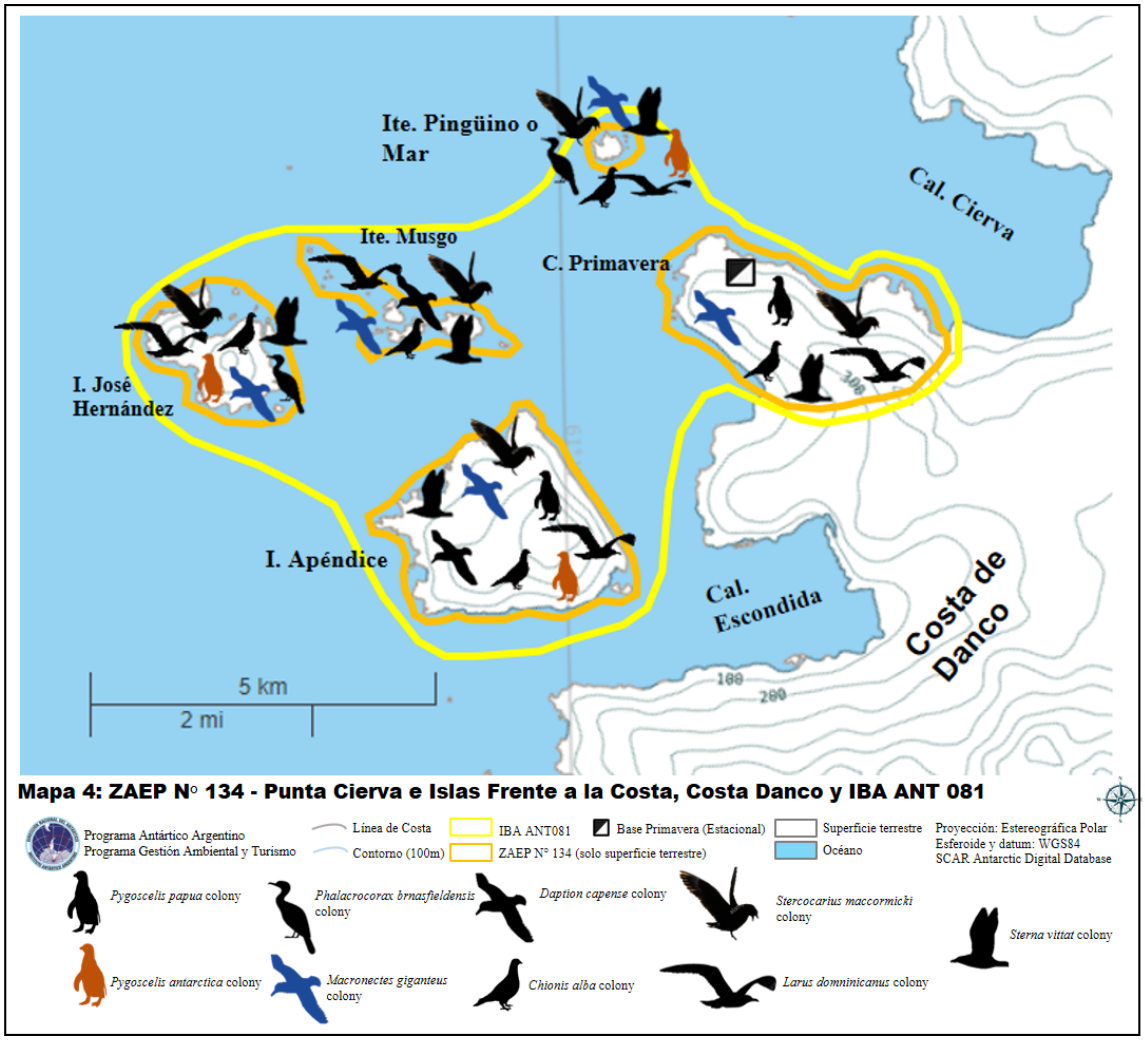

Figure 7: Detail of the limits of the sectors that make up ASPA 134 and IBA ANT081. Also shown is the general location of the different colonies of birds located in the reserve.

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