Management Plan

For Antarctic Specially Protected Area No. 128 WESTERN SHORE OF ADMIRALTY BAY, KING GEORGE ISLAND, SOUTH SHETLAND ISLANDS

Introduction

The Western Shore of Admiralty Bay is located on King George Island, South Shetland Islands, ~125 kilometers from the northern Antarctic Peninsula. Approximate area and coordinates: 16.8 km2 (centered at 62° 11' 50" S, 58° 27' 40" W). The Area is wholly terrestrial, and the primary reasons for designation are its diverse avian and mammalian fauna and locally rich vegetation, providing a representative sample of the maritime Antarctic ecosystem. Long term scientific research has been conducted on the animals within the Area. The Area is relatively accessible to nearby research stations and tourist ships regularly visit Admiralty Bay, so the ecological and scientific values of the area need protection from potential disturbance.

The Area was originally designated as Site of Special Scientific Interest (SSSI) No. 8 in Recommendation X-5 (1979, SSSI No. 8) after a proposal by Poland. The SSSI designation was extended through Recommendation XII-5 (1983), Recommendation XIII-7 (1985) and Resolution 7 (1995). Revised Management Plans were adopted through Measure 1 (2000), Measure 4 (2014) and Measure 2 (2019). The site was renamed and renumbered as Antarctic Specially Protected Area (ASPA) No. 128 by Decision 1 (2002). The Area lies within Antarctic Specially Managed Area (ASMA) No. 1 Admiralty Bay, King George Island, South Shetland Islands, originally designated through Measure 2 (2006) and revised through Measure 14 (2014) and Measure 1 (2023).

The biological and scientific values of the Area are vulnerable to human disturbance (e.g. oversampling, disturbance to wildlife, introduction of non-native species). Therefore, it is important that human activities in the Area are managed to minimize the risk of impacts. The Area is considered of sufficient size to protect the values for which special protection is required because it includes within the boundaries numerous examples of the features represented (e.g. plant and animal communities), which should ensure that the Area is able to withstand changes that could arise from local or regional pressures, particularly when considered in combination with other instruments that apply in the region such as Antarctic Specially Managed Area No.1 Admiralty Bay, the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR), and the Agreement on the Conservation of Albatrosses and Petrels (ACAP).

Antarctic Important Bird Area No. 046 West Admiralty Bay is identified within the Area. The Area comprises environments within three of the domains defined in the Environmental Domains Analysis for Antarctica (Resolution 3 (2008)): Environment A – Antarctic Peninsula northern geologic; Environment E – Antarctic Peninsula, Alexander and other islands; and Environment G – Antarctic Peninsula offshore islands. Areas of ice-free ground classified as Region 3 – Northwest Antarctic Peninsula under the Antarctic Conservation Biogeographic Regions classification (Resolution 3 (2017)) lie within the Area.

1. Description of Values to be Protected

The western shore of Admiralty Bay possesses a diverse avian and mammalian fauna and locally rich vegetation which is representative of the maritime Antarctic terrestrial ecosystem. The breeding colonies of Adélie (*Pygoscelis adeliae*) and gentoo penguin (*Pygoscelis papua*) within the Area are among the largest on King George Island, and the site is one of only a few protected areas where all three *Pygoscelid* penguins (including chinstrap (*Pygoscelis antarcticus*)) are found breeding together at the same location. Nine other birds breed within the Area, including southern giant petrel (*Macronectes giganteus*), cape petrel (*Daption capense*), Wilson's storm petrel (*Oceanites oceanicus*), black-bellied storm petrel (*Fregetta tropica*), snowy sheathbill (*Chionis albus*), south polar skua (*Catharacta maccormicki*), brown skua (*Catharacta antarctica*), kelp gull (*Larus dominicanus*), and Antarctic tern (*Sterna vittata*).

Southern elephant seals (*Mirounga leonina*), Antarctic fur seals (*Arctocephalus gazella*), Weddell seals (*Leptonychotes weddellii*) rest and/or breed on a number of beaches within the Area. Leopard seals (*Hydrurga leptonyx*) and crabeater seals (*Lobodon carcinophagus*) are frequent in waters of Admiralty Bay and are occasionally present on beaches within the Area.

Rich terrestrial plant communities exist within the Area, including one of the most extensive areas colonized by the Antarctic hairgrass *Deschampsia antarctica* and the pearlwort *Colobanthus quitensis* in Antarctica. Extensive stands of moss from the families Andreaeaceae, Bryaceae, Polytrichaceae, Pottiaceae and Grimmiaceae are present, particularly near the coast up to 60 m above sea level. Lichen assemblages are more dominant at higher elevations. Rich microbial communities are also represented, including algae (e.g *Prasiola*, *Phormidium*), mites (from the Orders / Suborders Prostigmata, Mesostigmata and Oribatida) and nematodes (e.g. *Plectus* and *Panagrolaimus*).

The values to be protected are those associated with the exceptionally diverse assemblage of plants and animals, which is a representative example of the Maritime Antarctic ecosystem, and the long-term scientific studies that have been undertaken within the Area, especially since 1976. In particular, scientific studies undertaken within the Area have been important in relation to documenting and interpreting large-scale regional shifts in pygoscelid penguin populations that have been observed on the Antarctic Peninsula and its offshore islands over recent decades.

Recent exposure of new areas of ice-free ground as a result of glacial recession offers opportunities for studies of colonisation processes, which represents an additional scientific value of the Area. Implementation of a program to eradicate the known population of the non-native species Poa annua on the deglaciated moraines near Ecology Glacier was successful in 2015, and the site continues to be systematically monitored for potential recolonization. The whole area is also monitored for the presence of other unintentionally introduced species.

2. Aims and Objectives

Management at the western shore of Admiralty Bay aims to:

- Avoid degradation of, or substantial risk to, the values of the Area by preventing unnecessary human disturbance;
- Allow scientific research on the ecosystem of the Area, in particular on the avifauna, pinnipeds and terrestrial ecology, while ensuring protection from oversampling or other possible scientific impacts;
- Allow other scientific research, scientific support activities and visits for educational and outreach purposes (such as documentary reporting (visual, audio or written) or the production of educational resources or services) provided that such activities are for compelling reasons that cannot be served elsewhere and will not jeopardise the natural ecological system in the Area;
- Minimize the possibility of introduction of additional alien plants, animals and microbes to the Area;
- Minimize the possibility of the introduction of pathogens that may cause disease in faunal populations within the Area;
- Continue the on-going monitoring of the non-native grass *Poa annua* in the Area, if the presence of a non-native plant is found, continue the eradication program, and to coordinate these strategies with those developed for the management of non-native species within ASMA No. 1 Admiralty Bay more generally;
- Implement a monitoring and, if possible, eradication program for the non-native fly *Trichocera maculipennis*, and to coordinate these strategies with those developed for other National Antarctic Programs active on King George Island; and
- Allow visits for management purposes in support of the aims of the management plan.

3. Management Activities

The following management activities shall be undertaken to protect the values of the Area:

- Notices showing the location of the Area (stating the special restrictions that apply) shall be displayed prominently, and a copy of this management plan shall be kept available, at all permanent scientific stations located within Admiralty Bay;
- Copies of this management plan shall be made available to all vessels and aircraft visiting the Area and/or operating in the vicinity of the adjacent stations, and all pilots and ship captains operating in the region shall be informed of the location, boundaries and restrictions applying to entry and overflight within the Area;
- National programs shall take steps to ensure the boundaries of the Area and the restrictions that apply within are marked on relevant maps and nautical / aeronautical charts;
- Signs illustrating the location and boundaries with clear statements of entry restrictions should be installed, as appropriate, at or near the northern boundary of the Area to help avoid inadvertent entry from the vicinity of nearby Arctowski Station (Poland). As appropriate, signs may be installed at hut facilities within the Area to help avoid inadvertent entry to the Area;
- Markers, signs or structures erected within the Area for scientific or management purposes shall be secured and maintained in good condition, and removed when no longer required;
- National Antarctic programs operating in the Area should maintain a record of all new markers, signs and structures erected within the Area;
- The presence of, and / or recolonization by, the non-native species *Poa annua* within the Area near Ecology Glacier should be monitored and the eradication program (mechanical removal by hand tools) continued as necessary, with reports on the effectiveness of any control and eradication measures, including on measures taken to mitigate against further introductions of non-native species, made by National Antarctic programs operating in the Area at least once every five years in support of management plan reviews;

- The presence of a breeding population of *Trichocera maculipennis* in the Area should be established. If the presence of a breeding population is confirmed, monitoring of the distribution and the impact on the local ecosystem should be undertaken. Eradication measures should be considered, including in a context broader than only within the Area to ensure any measures will be effective. Management measures taken should be reported to the ATCM.
- Instruction on the provisions and contents of the Management Plan is the responsibility of national programs, tour operators, independent visitors or appropriate national authorities that have personnel (national program staff, field expeditions, tourist expedition leaders, independent visitors and pilots) who will be in the vicinity of, accessing (only under the terms of "General permit conditions") or flying over the Area.
- Visits shall be made as necessary (no less than once every five years) to assess whether the Area continues to serve the purposes for which it was designated and to ensure management and maintenance measures are adequate;
- National Antarctic Programs operating in the region shall consult together with a view to ensuring that the above provisions are implemented.

4. Period of Designation

Designated for an indefinite period.

5. Maps and Photographs

- **Map 1:** ASPA No. 128 Western Shore of Admiralty Bay, King George Island – Regional overview.

  Inset: Location of King George Island, South Shetland Islands, Antarctic Peninsula. Topography and coastlines provided by Proantar, Brasil. Bathymetry: International Bathymetric Chart of the Southern Ocean (IBCSO) v1 (2013). Other data supplied by Environmental Research & Assessment.

  Projection: Lambert Conformal Conic; Standard parallels: 1st 62°00' S; 2nd 62°15' S; Central Meridian: 58°15' W; Latitude of Origin 64°00 S; Spheroid and horizontal datum: WGS84
- **Map 2:** ASPA No. 128 Western Shore of Admiralty Bay: access, facilities & wildlife.

  Map specifications: Projection: UTM Zone 21S; Spheroid and horizontal datum: WGS84. Topography and bathymetry provided by Proantar, Brasil. Coastline updated from WorldView-3 (01 Feb 2024; imagery © 2024 Maxar: provided by Polar Geospatial Center (NSF #2129685). Streams digitized from orthophoto map by Pudelko (2007)). Location of former colonisation site of *Poa annua*, small boat landing sites, marker and HSM No.51 supplied by Polish Antarctic Program. Other data supplied by Environmental Research & Assessment.

6. Description of the Area

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

General description

The Area is situated on the western shore of Admiralty Bay on the south side of King George Island, which is the largest of the South Shetland Islands archipelago. Arctowski Station (Poland) is situated 0.5 km to the north. The Area comprises ice-free terrain including steep crags of up to 400 m in elevation with more gentle morainic slopes interspersed by several glaciers extending down to the coast. The shoreline consists of broad pebbly beaches interrupted by rocky headlands. The Area is ~17 km².

Boundaries and coordinates

The eastern boundary of the Area follows the coastline on the western shore of Admiralty Bay from the SE extremity of Halfmoon Cove (62°09'44"S, 58°27'49"W) for ~ 6 km SSE to Demay Point (Map 2). The boundary thence follows the coastline SW around Paradise Cove and Uchatka Point approximately 3.5 km to Telefon (Patelnia) Point (62°14'03"S, 58°28'28"W). From Telefon Point the boundary extends northward in a straight line for ~2.3 km to The Tower (367 m; 62°12'55"S, 58°28'48"W), a distinctive peak above Tower Glacier. The boundary continues in this direction a further 5.3 km to Jardine Peak (285 m; 62°10'03"S, 58°29'54"W). The boundary descends eastward in a straight line from Jardine Peak for ~1.7 km to the highest point on Penguin Ridge, ~ 550 m from Arctowski Station. The boundary thence extends NE for ~0.3 km to the SE coast of Halfmoon Cove. A marker is placed in Halfmoon Cove on the northern boundary of the Area at 62°09'43.7" S, 58°27'48.7" W, ~500 m southeast of Arctowski station (Map 2).

Climate

The climate of the Area is typical of maritime Antarctica. Based on complementary data obtained at Arctowski Station (Poland) between 1977-98 (Marsz & Styszyńska 2000) and 2013-17 (Plenzler *et al*. 2019), and from 2006 and at the Comandante_Ferraz Station (Brazil) since 1984, the microclimate of Admiralty Bay is characterized by an average annual temperature of around -I.7 °C. An average annual wind speed for 1977-98 was of approximately 6.6 m s-¹ (Marsz & Styszyńska 2000). In 2013-17, the mean multi-annual wind speed at 2.5 m a.g.l was 5.7 m s-¹ with SW as predominant wind direction (31.3 %) (Plenzler *et al*. 2019). The total sum of precipitation in 2017 was 491.2 mm, which was similar to the mean annual precipitation during 1977-98, which was 499.8 mm (Plenzler *et al*. 2019). Furthermore, for 2013-17 mean annual humidity was 78.1%, while that during 1978-97 was 82.3%. The annual mean air pressure near the Arctowski Station is 990 hPa (Plenzler *et al*. 2019). The waters of Admiralty Bay have an annual temperature range of -1.8° to +4°C, being well mixed by tides and strongly influenced by currents and coastal upwelling (from ASMA No.1 Admiralty Bay Management Plan).

The climate has recently been changing under the influence of unstable pressure systems such as the Southern Annular Mode (SAM) and the El Nino Southern Oscillation (ENSO) (Bers *et al*. 2012). Rapid regional warming of air temperature on the Western Antarctic Peninsula (WAP) observed over the last 50 years is exceptional and unprecedented in comparison with the record from ice core data over the past 500 years (Vaughan & Doake 1996). The most recent reconstructions show a warming trend between 1957 - 2006 of 0.12 °C per decade for the whole Antarctic continent, and of 0.17 °C per decade for West Antarctica (Steig *et al*. 2009). Schloss *et al*. (2012) show the 50-year warming trend has yielded an average increase of air temperature of about 2.0° C in summer and 2.4° C in winter at nearby Carlini Station (Map 1). Kejna *et al*. (2013), analysing data from all available meteorological sources on King George Island and on Deception Island, showed a 1.2 °C increase in annual average air temperature and a 2.3 hPa decrease in atmospheric pressure over a comparable time period. In 2017, and the preceding 2016, the mean annual temperature at Arctowski Station was approximately 1°C higher than the preceding years 2013-15 (Plenzler *et al*. 2019).

Geology, geomorphology and soils

Geological investigations on King George Island prior to 1980 were performed by British, Argentinian, Russian and Chilean scientists, although the area within ASPA No. 128 was not described because it does not have any paternal lithostratigraphic rock sequences (for details see Birkenmajer 2003). The first geological map covering this area was presented by Birkenmajer (1980), republished with minor modifications in Birkenmajer (2003). The area of ASPA No.128 is included by Birkenmajer (2003) in the Warszawa tectonic block (terrane), that consists of Cretaceous, Paleocene, Eocene volcanic and pyroclastic rock with trace participation of sedimentary rocks. Volcanic rocks belong mainly to basalt, basaltic andesite, andesite intercalated with tuffs, scoria and volcanic breccia. Sediments bearing plant remains occur only in the thin horizon (<1 m) of the upper part of Zamek sections. Moreover, dispersed petrified wood is present in agglomerates of the Tower, and abundant fossil flora was present in reworked clastics of the Błaszczyk moraine. A rich collection of dicotyledonous leaf, represented mainly by the genus *Nothofagus* and by laurophyllos plant frond impressions as well as conifer shoot imprints, was gathered and described from this site (Birkenmajer & Zastawniak 1989; Zastawniak 1994; Dutra & Batten 2000). Several hypabyssal intrusions (plug, dykes, sills) of diversified petrographic and geochemical composition cut stratiform volcanic complexes of Warszawa Terrane (Barbieri *et al*. 1987). Isotopic analyses (^{40}Ar–^{39}Ar of rock and U-Pb of zircons) gave Eocene ages for most of the rocks from the Area considered previously as Cretaceous, including the fossil flora bearing formations (Nawrocki *et al*. 2011).

Poor tundra soils occurring in the maritime Antarctic climate are difficult to describe according to criteria used in traditional soil classification systems. The first ecological and intuitive soil classification covering the maritime Antarctic, including ASPA No.128, was proposed by Everett (1976). Schaefer *et al*. (2007) identified 20 soil-scape units in the Arctowski Station vicinity and classified them according to their vulnerability in a geo-environmental map, partly comparable to that of more formal soil units proposed by Blume *et al*. (2002). Particular attention has been focused in this region on coastal soils around penguin colonies, since their fertile ecosystems are highly productive and biologically diverse. Ornithogenic soils were fully described and mapped (or indicated on air photographs) in papers by Tatur & Myrcha (1984); Tatur (1989) and Tatur (2002). Ornithogenic soils of the maritime Antarctic were subdivided into: organic soils of the rookery (with hydroxyapatite); soils of the phosphatized zone (with Al-Fe phosphates bearing K and NH4 ions) and soils accumulated from inactive reworked phosphates. Moreover, relic soils at the locations of abandoned penguin colonies were distinguished and are an important feature in the Area. The phosphatization was described as a soil forming process, investigated also in other papers (e.g. Simas *et al*. 2007).

Glaciology, streams and lakes

The Area is shaped by valley glaciers draining the Warszawa icefield, which are constrained at the sides by exposed bedrock. Isolated rocky hills are covered by rock rubble, with glaciers and glacial deposits filling depressions among them. Prominent early Holocene cliffs may be observed in the coastal zone. Holocene raised beaches (up to 16 m a.s.l.) and more recent beaches are comprised of sand with pebbles and boulders.

Several glaciers descend into the Area, flowing eastward from the Warszawa Icefield (Map 2). These have been in continuous retreat for at least the last 30 years, with former tidal glacier fronts retreating up to 900 m inland between 1997–2007 (Battke *et al*. 2001; Pudełko 2007), which is consistent with a global warming trend and a local reduction in the size of floating glaciers in Admiralty Bay (Braun & Gossmann 2002) . The ice-free area of ASPA No128 has increased from 20% in 1979 to more than 50% in 1999 (Battke *et al*. 2001) and continues to increase. Retreating glaciers deposited bands of ridges formed by fresh lateral moraines and ground moraines on the flat areas at the front of glaciers, often with brackish water lagoons collecting glacial meltwaters mixed with seawater (Ecology, Baranowski, and Windy glaciers). Newly exposed land and new water bodies are colonized by biota that create a unique opportunity to study succession processes in the Antarctic environment (Olech & Massalski 2001).

A number of small meltwater streams are present within the Area, mainly originating from the outlet glaciers flowing down from the Warszawa Icefield (Map 2).

Terrestrial ecology

Vegetation typical of the maritime Antarctic has partially colonised the ice-free terrain within the Area. Dry areas and rocks are colonised by lichens, with flowering plants such as *Deschampsia antarctica* and *Colobanthus quitensis* locally numerous and occupying fairly large areas particularly in the vicinity of Arctowski Station. This constitutes one of the largest areas covered by these species in the Antarctic. Bryophyta and flowering plants dominate the vegetation from 0 to 60 m a.s.l., while lichens are more dominant above this elevation. Mosses can be found from the families Andreaeaceae, Bryaceae, Polytrichaceae, Pottiaceae and Grimmiaceae. Around penguin colonies the species richness and diversity is lower due to the high nitrate and ammonia content of the soil (Olech 2002; Victoria *et al*. 2009)located at Admiralty Bay, inside the King George Island, was investigated during the 2002/2003 and 2003/2004 summer season. The most representative families had been Bryaceae, Polytrichaceae, Andreaeaceae and Pottiaceae. The most frequent species had been Sanionia uncinata (Hedw..

A non-native species of grass, *Poa annua*, was observed in 2008/09 within the Area on the deglaciated moraines of the Ecology Glacier (Olech & Chwedorzewska 2011) (approximate location 62° 10′ 7″S, 58° 27′ 54″W, Map 2). This species was first recorded outside of the Area, at Arctowski Station, in summer 1985/86 (Olech 1996), first in places where the soil structure had been disturbed by human activities and later within native vegetation communities (Chwedorzewska 2008)). High genetic variability suggests several separate immigration events from different sources, including Europe and South America (Chwedorzewska 2008). As of 2023/24, this species has been eradicated from the Area.

Recently, propagules and pollen of the rush *Juncus bufonius* were found in one location within the Area (Cuba-Diaz *et al*. 2012).

Three different types of mite are present in the Area: Prostigmata, Mesostigmata and Oribatida. Prostigmata is the dominant community and Oribatida is only found in ice free areas that have been ice-free for more than 30 years (Gryziak 2009).

Glacial recession has exposed new ice-free areas that are being successively colonized by microbial and invertebrate communities including algae, mites and nematodes, as well as lichens, mosses and vascular plants. The pioneer species that appeared first were the moss *Bryum pseudotriquetrum*, and then the grass *Deschampsia antarctica*. In the second stage of succession the dominance of *Colobanthus quitensis* was marked. The first rock-inhabiting lichens (*Caloplaca johnstoni*, *C. sublobulata, Lecanora* spp.) appeared in the third stage of succession. The substantial influence of penguin colonies, which occur in the Telefon (Patelnia) Point region, was revealed in the fourth stage. On rocks the ornithocoprophilous communities of epilithic lichens dominated, while on soil the grass *Deschampsia antarctica* with the nitrophilous algae (*Prasiola crispa*, *Phormidium* spp.) and mosses (e.g. *Syntrichia magellanica*) were prominent (Olech & Massalski 2001). The abundance of nematodes increases with the age of the ice free area and common species present are *Plectus* and *Panagrolaimus* (Ilieva-Makulec & Gryziak 2009).

Breeding birds

Twelve bird species regularly breed within the Area, the most numerous of which are penguins. In 2023/24 there were 4765 breeding pairs of Adélie penguin (*Pygoscelis adeliae*), 432 breeding pairs of chinstrap penguin (*Pygoscelis antarcticus*) and 9410 breeding pairs of gentoo penguin (*Pygoscelis papua*) (unpublished data Polish Ecological Monitoring program). Interannual variation in breeding pairs is large for all these species, with changes in some years in excess of 40% (Ciaputa & Sierakowski 1999). Significant decreases in average penguin breeding numbers were observed between the four-year periods of 1978-81 and 2014-18, when an average decrease of ~66% was observed for Adélie penguins and over 87% for chinstrap penguins, while gentoo penguins have increased by 216%. These trends are consistent with those observed for these species at other nearby colonies on King George Island, in particular those at Lions Rump (Korczak-Abshire *et al*. 2013), Turret Point (Korczak-Abshire *et al*. 2018) and Stranger Point (Carlini *et al*. 2009). Hinke *et al*. (2017) modelled future trends in the Copacabana Adélie penguin colony based on almost 30 years of historical data (1982-2011), finding a one in three probability of >90% declines in the local population over the next 30 years, and a near 100% probability for a decline of 50%, given status-quo conditions. New methods to monitor seabird breeding performance within the Area are being applied using autonomous time-lapse photography, which is an important component of the CCAMLR Ecosystem Monitoring Program to inform fisheries management (Hinke *et al*. 2018).

The regional trends and breeding data suggest differential over-winter survival between the species (Hinke *et al*. 2007, Carlini *et al*. 2009), which relates to influences remote from nesting sites within the Area. Therefore, the changes being observed in populations at breeding sites within the Area are not considered related to human pressures or impacts occurring within the Area.

Table 1: Four-year averages of numbers of penguin breeding pairs within ASPA 128 (based on data from Ciaputa & Sierakowski 1999, US AMLR program unpublished data, Polish Ecological Monitoring program unpublished data).

Species	Location	Census Period				
		1978-81	1992-96	2009-12	2014-17	2019-22
Pygoscelis adeliae	Llano Point	10859	6073	2454	2853	2231
	Point Thomas	11899	9886	4578	4740	3196
	Total	***22758***	***15959***	***7032***	***7593***	***5427***
Pygoscelis antarcticus	Telefon Point	2029	1511	604	461	336
	Uchatka Point	1944	909	292	236	146
	Demay Point	819	263	52	15	6
	Llano Point	347	8	2	10	16
	Point Thomas	541	1	0	1	2
	Total	***5681***	***2692***	***950***	***723***	***506***
Pygoscelis papua	Llano Point	2174	1765	4646	6162	8083
	Point Thomas	715	267	90	76	0
	Total	***2889***	***2032***	***4736***	***6238***	***8083***

Nine other bird species breed within the Area: cape petrel (*Daption capense*); Wilson's storm petrel (*Oceanites oceanicus*); black-bellied storm petrel (*Fregetta tropica*); snowy sheathbill (*Chionis albus*); kelp gull (*Larus dominicanus*); Antarctic tern (*Sterna vittata*); southern giant petrel (*Macronectes giganteus*), whose number of active nests in the area in the 2020/21 season was 208 (143 for the Rescuers Hills nesting group, 63 for Llano Point and 2 for Petrel Hill (census date December 4, 2020)), the number of chicks 106 (66, 39 and 1 for the subgroups, respectively (census date February 8, 2020)) (Fudala & Bialik 2022a); south polar skua (*Catharacta maccormicki*) and brown skua (*C. antarctica*). Data for the latter two species show successful breeding was rare in the 2012/13 season (Table 2), when no south polar skua or mixed pairs bred. Despite the poor skua breeding performance in that season, numerous birds were present on territories (Hinke pers. comm. 2013, U.S. AMLR program). More recent data (Hinke pers. comm. 2018) show the number of breeding pairs has recovered since the low in 2012/13, and while still considerably fewer than in 2004/05 the total population was at a level similar to that in 1978/79. In 2022/23 season the number of breeding pairs of the south polar skua has exceeded the number from the 2004/05 season (Polish Ecological Monitoring program unpublished data).

Table 2: Skua breeding pair census (Carneiro et al. 2009, US AMLR program unpublished data Hinke pers. comm. 2018, Polish Ecological Monitoring program unpublished data)

Location	Brown Skua				South Polar Skua				Mixed Skua			
	2004-2005	2012-2013	2016-2017	2022-2023	2004-2005	2012-2013	2016-2017	2022-2023	2004-2005	2012-2013	2016-2017	2022-2023
Llano Point to Telefon Point	21	11	16	27	27	0	21	44	6	0	1	5
Point Thomas	21	7	12	10	45	0	14	35	10	0	2	6

Four other penguin species (king (*Aptenodytes patagonicus*), emperor (*Aptenodytes forsteri*), rockhopper (*Eudyptes chrysocome*) and Magellanic (*Spheniscus magellanicus*)) are occasionally observed within the Area. Other Antarctic bird species (e.g. snow petrel (*Pagodroma nivea*)) are also occasionally observed within the Area (Gryz *et al*. 2018, Sierakowski *et al*. 2017)).

Seven South American bird species have been observed within the Area as stray visitors that remained only temporarily: cattle egret (*Bubulcus ibis*), black-necked swan (*Cygnus melanocoryphus*), Chiloe wigeon (*Anas sibilatrix*), Yellow-billed pintail (*Anas georgica*), white-rumped sandpiper (*Calidris fuscicollis*), Wilson's phalarope (*Pharalopus tricolor*) and barn swallow (*Hirundo rustica*) (Poland 2002; Korczak-Abshire *et al*. 2011a; Korczak-Abshire *et al.* 2011b).

Antarctic Important Bird Area (IBA) No. 046 West Admiralty Bay lies within the Area, which was identified for its large colony of Gentoo penguins and the concentration of seabirds present (Harris *et al*. 2015). Dias *et al*. (2018) identified the adjacent marine area, including all of Admiralty Bay and extending ~20 km into Bransfield Strait, as an important foraging ground for penguins breeding on the western shore of Admiralty Bay.

Breeding mammals

Southern elephant seals (*Mirounga leonina*), Antarctic fur seals (*Arctocephalus gazella*) and Weddell seals (*Leptonychotes weddellii*) are present on beaches at numerous sites, although only southern elephant seals and occasionally Weddell seals breed within the Area. In 2009-10 six southern elephant seal harems with 238 pups were observed within the Area (Map 2), while in the same year the maximum number of Antarctic fur seals exceeded 1290 individuals (Korczak-Abshire, pers. comm.). In the 2019/20 season, southern elephant seal harems have been reported in two locations: at the Patelnia (Telefon) Point and Blue Dyke. The largest reproductive aggregation of seals forms annually on Patelnia, with 428 females recorded in this subarea at the peak of the season 2019 (October 25) (Fudala & Bialik 2022b) and the maximum number of pups reaching 418 on 4 November 2019 (Fudala & Bialik 2020). Four Weddell seal pups were observed in the Point Thomas area in 2011 (Korczak-Abshire, pers. comm. 2019). Annual seal censuses have been conducted by Poland year-round once every ten days since 1988 (Ciaputa 1996; Salwicka & Sierakowski 1998; Salwicka & Rakusa-Suszczewski 2002). A strong annual cycle in numbers is evident, with the number of southern elephant seals reaching a maximum during the moulting period from December to February and Antarctic fur seals showing a high peak around February and another lower peak around June. Leopard seals (*Hydrurga leptonyx*) and crabeater seals (*Lobodon carcinophagus*) are frequently seen on ice floes during the winter, although rarely come ashore (Salwicka & Rakusa-Suszczewski 2002).

Human activities / impacts

The permanent year-round Arctowski Polish Antarctic Station (62°09'34"S, 58°28'15"W) situated 0.5 km north of the Area (Map 1) has been occupied continuously since 1977 and can host up to 70 people during the summer, and 20 during winter. Several other permanent national program stations are located nearby within Admiralty Bay, including Ferraz (Brazil) (~9.5 km from the Area), Machu Picchu (Peru) (~7.6 km from the Area) and Vincente (Ecuador) (~5.2 km from the Area). Activities of national programs operating with the region are coordinated under the management plan for ASMA No. 1 Admiralty Bay.

A semi-permanent summer-only field camp (US) (62°10'46"S, 58°26'49"W) is situated within the Area south of Llano Point (Map 2). Known as 'Copacabana', the field camp has capacity for up to six people and has been occupied by ornithologists every summer season since it was established in 1985.

A small (16 m^2, 4 berth) wooden refuge (Poland) (62°13'03"S, 58°26'32"W) is situated ~300 m NW of Uchatka Point near the shore of Paradise Cove. The hut is used mostly by researchers who study the pinniped and penguin colonies located in the southern part of the Area. The refuge also serves as a base camp for glaciologists, geologists and botanists working on Baranowski and Windy Glaciers.

Admiralty Bay has been a perennial destination for tourism due to its location, historic and ecological values, and the interest provided by permanent scientific stations. Arctowski Station has been particularly popular (Chwedorzewska & Korczak 2010), with a peak of over 5000 visitors in 2007/08, although in recent years the number of tourists visiting per season ranged between 871 and 2703 (Table 3). The principal activities conducted are station visits, with extended walks, kayaking and small boat cruises also being undertaken near to, but outside of, the Area.

Table 3: Number of tourist visits to Arctowski Station 2016-2024 (Source: Seasons 2016-18: IAATO, seasons 2018-2024: Polish Ecological Monitoring program)

Season	Number of Tourists (landed and non-landed)	Number of Tourists Landed only	Number of Vessels
2016-17	871	871	5
2017-18	2106	2106	6
2018-19	1300	1300	7
2019-20	2703	2703	13
2020-24	0	0	0

The level of visitation at Arctowski Station makes the Area relatively vulnerable to the introduction of non-native species. One such species, the grass *Poa annua*, has established a stable population at Arctowski Station (Olech 1996), and was present on a deglaciated moraine inside the Area (approximate location 62° 10' 7"S, 58° 27' 54"W , Map 2). At the latter site approximately 70 individuals were reported spread over an area of 100 m^2 in 2011 (Olech & Chwedorzewska 2011), although all individuals have since been removed. Since 2014/15 Poland has embarked on a systematic eradication/monitoring program (Galera *et al.* 2017).

A survey of moraines within the Area in the Ecology Glacier forefield was repeated in 2015/16. Three seedlings of *P. annua* were found, which were documented and removed by hand tools, with the sites marked for on-going monitoring (Poland 2016). This area was re-surveyed in March 2017 and no new *P. annua* seedlings were found (Poland 2017). In the 2018 summer season several plants were discovered and removed from within the Area (again in the glacial forefield of Ecology Glacier). As of April 2018, no *Poa annua* has been found in the Area, and inspections are carried out every summer season. According to the latest unpublished data of the Polish Ecological Monitoring program, inspections carried out during the 2023/24 season excluded the presence of *Poa annua* in the area. The eradication of *Poa annua* is carried out continuously in the Arctowski Station's infrastructure area and the progress of these treatments is reported at the annual ATCM.

Historical, morphometric and genetic analyses revealed that the population in the vicinity of Arctowski Station had most likely originated from multiple introductions from Poland and perhaps also South America (Chwedorzewska *et al*. 2015; Galera *et al*. 2017), while the Ecology Glacier population within the Area had most likely been transferred directly from the station area by human activity rather than aerial dispersal (Wódkiewicz *et al*. 2017). Thus, eradication of the invasive species from the vicinity of Arctowski Station is important to preventing further and repeated introductions to the Area.

The first report documenting the presence of *T. maculipennis* on King George Island was from the Uruguayan Base Científica Antártica Artigas in 2006 (Volonterio *et al.* 2013). Subsequently, there have been reports of the fly within or in the surroundings of the following stations on the island: Artigas, Arctowski, Escudero, Frei, Fildes, and King Sejong. This species has established itself in natural areas, as well as within buildings such as sewage treatment plants, scientific research stations, military bases, and hydroponic installations (Hughes *et al*. 2005; Volonterio *et al.* 2013).

The non-native *T. maculipennis* fly was first reported at the Polish Antarctic Arctowski Station with live larvae and adult individuals in the sewage system in October 2017 (Potocka & Krzemieńska 2018). Only a few adult individuals were observed outside the facility at a distance of less than 50 cm from the septic tank (Potocka *et al.* 2020). Since their discovery, their presence has been recorded on a regular basis. Imago individuals of *T. maculipennis* have been recorded at Arctowski Station throughout the year.

Systematic monitoring and control measures have been carried out at the Arctowski Station to eradicate *T.maculipennis*. After the initiation of several control measures, the number of recorded individuals dropped significantly, with fewer than 10 individuals being observed during the summer of 2019/20. In the 2020/21 season, 1 individual was found in the adhesive trap in a 4 °C storage container, and no flies were found in the septic tank or in the buildings. The number of individuals recorded on adhesive traps on station infrastructure increased to 33 individuals reported in two summer seasons combined: between November 2021 and the beginning of April 2023. *T. maculipennis* was not found in the septic tank during these seasons.

In the 2022/23 season, a new sewage treatment plant and storage system were implemented at Arctowski Station. Monitoring and eradication of the fly are carried out continuously on the station's infrastructure and will be continued.

In December 2022, imago individuals of the genus Trichocera were reported at two locations within the Area (Poland, 2023). Approximately 23 individuals were observed at a stream located near Llano Point (58° 27' 3.114" S, 62° 9' 45.6156" W), and more than 30 individuals were observed in the Rakusa Point area (58° 27' 37.8756" S, 62° 9' 45.6156" W) on the shore opposite the Glacier Ecology lagoon. Trichocera monitoring within the Area was implemented in the 2023/24 season by the Polish Ecological Monitoring Program and confirmed the presence of the fly at another location, at Blue Dyke (58° 26' 53.772" S, 62° 13' 24.672" W). All subsequent results will be reported to the ATCM.

It should be taken into account that *T.maculipennis* may occur at numerous locations on King George Island beyond the Area, so eradication efforts should be coordinated among all Antarctic programs active on King George Island.

Arctowski Station has been closed to tourist visits since the 2020/21 season due to the COVID-19 pandemic and for station renovations (Poland 2021). The station is planned to remain closed to tourist visits until at least the 2025/26 season, due to minimise the risk of the further uncontrolled spread of the non-native species *Poa annua* and *Trichocera maculipennis*.

6(ii) Access to the Area

The Area may be accessed by traversing over land or sea ice, by sea or by air. Particular routes have not been designated for access to the Area. Small boat access, overflight and aircraft landing restrictions apply within the Area, the specific conditions for which are set out in Section 7(ii) below.

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

Two structures are located within the Area (Map 2): Copacabana Field Camp (US) (62° 10' 45.89" S, 58° 26' 49.27" W), located ~500 m south of Llano Point and consisting of three wooden huts to accommodate up to six people. A four-berth wooden refuge (Poland) (62° 13' 2.9" S, 58° 26' 32.27" W) is located in Paradise Cove ~1.2 km SW of Demay Point.

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

ASPA No.125, Fildes Peninsula, King George Island (25 de Mayo), and ASPA No 150, Ardley Island, Maxwell Bay, King George Island (25 de Mayo), lie ~27 km west of the Area (Map 1). ASPA No.132, Potter Peninsula, and ASPA No.171 Narebski Point, Barton Peninsula, lie ~15 km and ~19 km to the west respectively on King George Island (25 de Mayo). ASPA No.151, Lion's Rump, King George Island, lies ~20 km to the east of the Area (Map 1). Historic Monument No.51, consisting of the grave of Wlodzimierz Puchalski surmounted by an iron cross, is situated ~80 m outside of the northern boundary of the Area (Map 2).

The Area lies within Antarctic Specially Managed Area (ASMA) No. 1 Admiralty Bay, King George Island, South Shetland Islands (Map 1).

6(v) Special zones within the Area

There are no zones designated within the Area.

7. Terms and Conditions for Entry Permits

7(i) General permit conditions

Entry into the Area is prohibited except in accordance with a Permit issued by an appropriate national authority. Conditions for issuing a permit for the Area are that:

- It is issued for scientific research, and in particular for research on the avifauna in the Area, or for compelling scientific, educational or outreach reasons that cannot be served elsewhere, or for reasons essential to the management of the Area;
- The actions permitted are in accordance with this Management Plan;
- The activities permitted will give due consideration via the environmental impact assessment process to the continued protection of the environmental, ecological and scientific values of the Area;
- Approach distances to fauna must be respected, except when the scientific projects may require otherwise and this is specified in the relevant permits;
- The Permit shall be issued for a finite period;
- The Permit, or a copy, shall be carried when in the Area.

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

Access into the Area is permitted on foot, by small boat or by aircraft. Vehicles are prohibited within the Area. Access to bird breeding areas during the breeding season (01 October to 31 March) is restricted to visitors conducting or supporting scientific research, carrying out educational or outreach activities consistent with the aims and objectives of the management plan, or undertaking essential management activities.

Foot access and movement within the Area

Persons on foot should at all times avoid disturbance to birds and seals, and damage to vegetation. Pedestrians entering the Area from the vicinity of nearby Arctowski Station should be particularly mindful of the potential to transfer plant material or seeds of the invasive non-native grass *Poa annua* and observe the precautions set out below in Section 7(v) to minimize the risk of further spread.

Pedestrians should maintain the following minimum approach distances from wildlife, unless it is necessary to exceed these for purposes allowed for by the permit:

- Southern giant petrels (*Macronectes giganteus*) – 50 m
- breeding/moulting other birds and seals, and Antarctic fur seals (for personal safety) – 15 m
- non-breeding birds and seals – 5 m.

Pilots, air, or boat crew, or other people in boats or aircraft are prohibited from moving on foot beyond the immediate vicinity of their landing site or the hut facilities unless specifically authorised by Permit. Visitors should move carefully so as to minimize disturbance to flora, fauna, and soils, and should walk on snow or rocky terrain where practical and avoid vegetated areas. Where possible avoid moist ground where foot traffic can easily damage sensitive soils, plant and algal communities, and degrade water quality. Pedestrian traffic should be kept to the minimum consistent with the objectives of any permitted activities and every reasonable effort should be made to minimize effects.

Small boat access

Access from the sea is permitted only by small boat. Access to the beach area between Llano Point and Sphinx Hill (Map 2) from the sea is prohibited in order to avoid interference with animal communities that are the subject of long-term and ongoing research, except for the purpose of visiting 'Copacabana' Field Camp for purposes allowed for by Permit, or in an emergency. The recommended landing sites for small boats are at the following locations (Map 2):

1) on the beaches at Halfmoon Cove or Arctowski Cove, both of which are outside of the Area where no permit for entry is required;

2) on the beach immediately in front of 'Copacabana' Field Camp (US); or

3) on the beach immediately in front of the refuge (PL) in Paradise Cove.

Access from the sea to any sites suitable for landing south of Sphinx Hill is allowed, provided this is consistent with the purposes for which a Permit has been granted. Visitors to the Area by small boat should inform Arctowski Station.

Access and overflight by piloted aircraft and Remotely Piloted Aircraft Systems (RPAS)

Due to the widespread presence of seabirds and pinnipeds within the Area during the breeding season (01 October – 31 March), access to the Area by piloted aircraft in this period is strongly discouraged. All restrictions on aircraft access and overflight apply between 01 October – 31 March inclusive, when aircraft shall operate and land within the Area according to strict observance of the following conditions:

1) Piloted aircraft should maintain a horizontal and vertical separation distance 2000 ft (~610 m) from the coast generally, and from the breeding wildlife colonies in particular, as identified on Map 2, unless otherwise authorized by permit;

2) Weather with a low cloud ceiling often prevails over King George Island, particularly in the vicinity of the permanent ice caps such as the Warszawa Icefield. Piloted aircraft should avoid the Area unless it is possible to maintain safely the minimum horizontal and vertical separation distance of 2000 ft (~610 m) given above;

3) Landing of helicopters within the Area is generally prohibited, except on permanent glaciers or in an emergency;

4) Helicopters operating in the region may land at the designated landing site located at Arctowski Station (62° 9.536' S, 58° 28.20' W) which should be approached from the NE over Admiralty Bay. Helicopter overflight of the northern boundary of Area where many birds and seals are present should be avoided;

5) Use of smoke grenades to indicate wind direction is prohibited within the Area unless absolutely necessary for safety, and any grenades used should be retrieved;

6) In circumstances not covered above piloted aircraft should, as a minimum standard, comply with the *Guidelines for the Operation of Aircraft near Concentrations of Birds* contained in Resolution 2 (2004);

7) Overflight below 2000 ft (610 m) and landings within the Area by Remotely Piloted Aircraft Systems (RPAS) are prohibited except in accordance with a permit issued by an appropriate national authority. RPAS use within the Area should follow the Environmental Guidelines for Operation of Remotely Piloted Aircraft Systems (RPAS) in Antarctica (Resolution 4 (2018)).

7(iii) Activities that may be conducted within the Area

- Scientific research that will not jeopardize the ecosystem or values of the Area;
- Activities with educational and / or outreach purposes that cannot be served elsewhere;
- Activities with the aim of preserving or protecting historic resources within the Area;
- Essential management activities, including management of non-native species within the Area, monitoring and inspection;
- Activities at the site within the Area known to have been colonised by the invasive grass *Poa annua* (Map 2) are specifically restricted to research or management related to the non-native species, and other access to this site is prohibited unless access is necessary for other compelling scientific or management reason(s) that cannot be served elsewhere. Those accessing the site shall take precautions not to spread the grass further by thoroughly inspecting and cleaning footwear, equipment and clothing before moving to another location both within or outside of the Area.

7(iv) Installation, modification or removal of structures / equipment

- No structures are to be erected within the Area except as specified in a permit and, with the exception of permanent survey markers and signs, additional permanent structures or installations are prohibited;
- All structures, scientific equipment or markers installed in the Area must be authorized by permit and clearly identified by country, name of the principal investigator, year of installation and date of expected removal. All such items should be free of organisms, propagules (e.g. seeds, eggs) and non-sterile soil, and be made of materials that can withstand the environmental conditions and pose minimal risk of contamination or damage to the values of the Area;
- Installation (including site selection), maintenance, modification or removal of structures or equipment shall be undertaken in a manner that minimizes disturbance to values of the Area, preferably avoiding the main breeding season (01 Oct – 31 Mar);
- Removal of specific structures / equipment for which the permit has expired shall be the responsibility of the authority which granted the original permit, and shall be a condition of the permit.

7(v) Location of field camps

The facilities 'Copacabana' Field Camp (United States) and refuge (Poland) at Paradise Cove (Map 2) provide limited accommodation for scientific use subject to the permission of the appropriate authority. Camping is prohibited elsewhere within the Area.

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

In addition to the requirements of the Protocol on Environmental Protection to the Antarctic Treaty, restrictions on materials and organisms that may be brought into the area are:

- Deliberate introduction of animals, plant material, micro-organisms and non-sterile soil into the Area is prohibited. Precautions shall be taken to prevent the accidental introduction of animals, plant material, micro-organisms and non-sterile soil from other biologically distinct regions (within or beyond the Antarctic Treaty area).
- Visitors shall ensure that sampling equipment and markers brought into the Area are clean. To the maximum extent practicable, footwear and other equipment used or brought into the area (including backpacks, carry-bags and other equipment) shall be thoroughly cleaned before entering the Area. This is particularly important when travelling to the Area from nearby Arctowski Station where the invasive grass *Poa annua* has become established, and footwear and equipment that has potential to be contaminated should be cleaned before departing the station and not worn or used around the station before entering the Area. Visitors should also consult and follow as appropriate recommendations contained in the Committee for Environmental Protection *Non-native Species Man*ual (Resolution 4 (2016), CEP 2019), and in the *Environmental Code of Conduct for Terrestrial Scientific Field Research in Antarctica* (Resolution 5 (2018)).
- All poultry brought into and not consumed or used within the Area, including all parts, products and / or wastes of poultry, shall be removed from the Area or disposed of by incineration or equivalent means that eliminates risks to native flora and fauna;
- Herbicides and pesticides are prohibited from the Area;
- Fuel, food, chemicals, and other materials shall not be stored in the Area, unless specifically authorized by permit and shall be stored and handled in a way that minimises the risk of their accidental introduction into the environment;
- All materials introduced shall be for a stated period only and shall be removed by the end of that stated period; and
- If release occurs which is likely to compromise the values of the Area, removal is encouraged only where the impact of removal is not likely to be greater than that of leaving the material *in situ*.

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

Taking or harmful interference with native flora and fauna is prohibited, except in accordance with a permit issued under Article 3 of Annex II of the Protocol on Environmental Protection to the Antarctic Treaty. Where animal taking or harmful interference is involved, this should, as a minimum standard, be in accordance with the SCAR Code of Conduct for the Use of Animals for Scientific Purposes in Antarctica.

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

- Material may be collected or removed from the Area only in accordance with a Permit and should be limited to the minimum necessary to meet scientific or management needs. This includes biological samples, rock specimens, whale bones, artefacts of the whaling industry, and any other historical item.
- Material of human origin likely to compromise the values of the Area, and which was not brought into the Area by the permit holder or otherwise authorized, may be removed from the Area, unless the impact of removal is likely to be greater than leaving the material *in situ*: if this is the case the appropriate authority must be notified and approval obtained.

7(ix) Disposal of waste

All wastes shall be removed from the Area, except human wastes and domestic liquid wastes, which may be removed from the Area or disposed of into the sea.

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

Permits may be granted to enter the Area to:

1) Carry out monitoring and Area inspection activities, which may involve the collection of a small number of samples or data for analysis or review;

2) Install or maintain signposts, markers, structures or scientific or essential logistic equipment;

3) Carry out protective measures, which may include mechanical removal of non-native species by hand tools;

4) Carry out research or management in a manner that avoids interference with long-term research and monitoring activities or possible duplication of effort. Persons planning new projects within the Area should consult with established programs working within the Area, such as those of Poland and the US, before initiating the work.

7(xi) Requirements for reports

- The principal permit holder for each visit to the Area shall submit a report to the appropriate national authority after the visit has been completed in accordance with national procedures and permit conditions.
- Such reports should include, as appropriate, the information identified in the visit report form contained in Appendix 2 of the Guide to the Preparation of Management Plans for Antarctic Specially Protected Areas (Resolution 2 (2011)). If appropriate, the national authority should also forward a copy of the visit report to the Parties that proposed the Management Plan, to assist in managing the Area and reviewing the Management Plan.
- Parties should, wherever possible, deposit originals or copies of such original visit reports in a publicly accessible archive to maintain a record of usage, for the purpose of any review of the Management Plan and in organising the scientific use of the Area.
- The appropriate authority should be notified of any activities / measures that might have been exceptionally undertaken, or anything released and not removed, that were not included in the authorized permit.

8. Supporting Documentation

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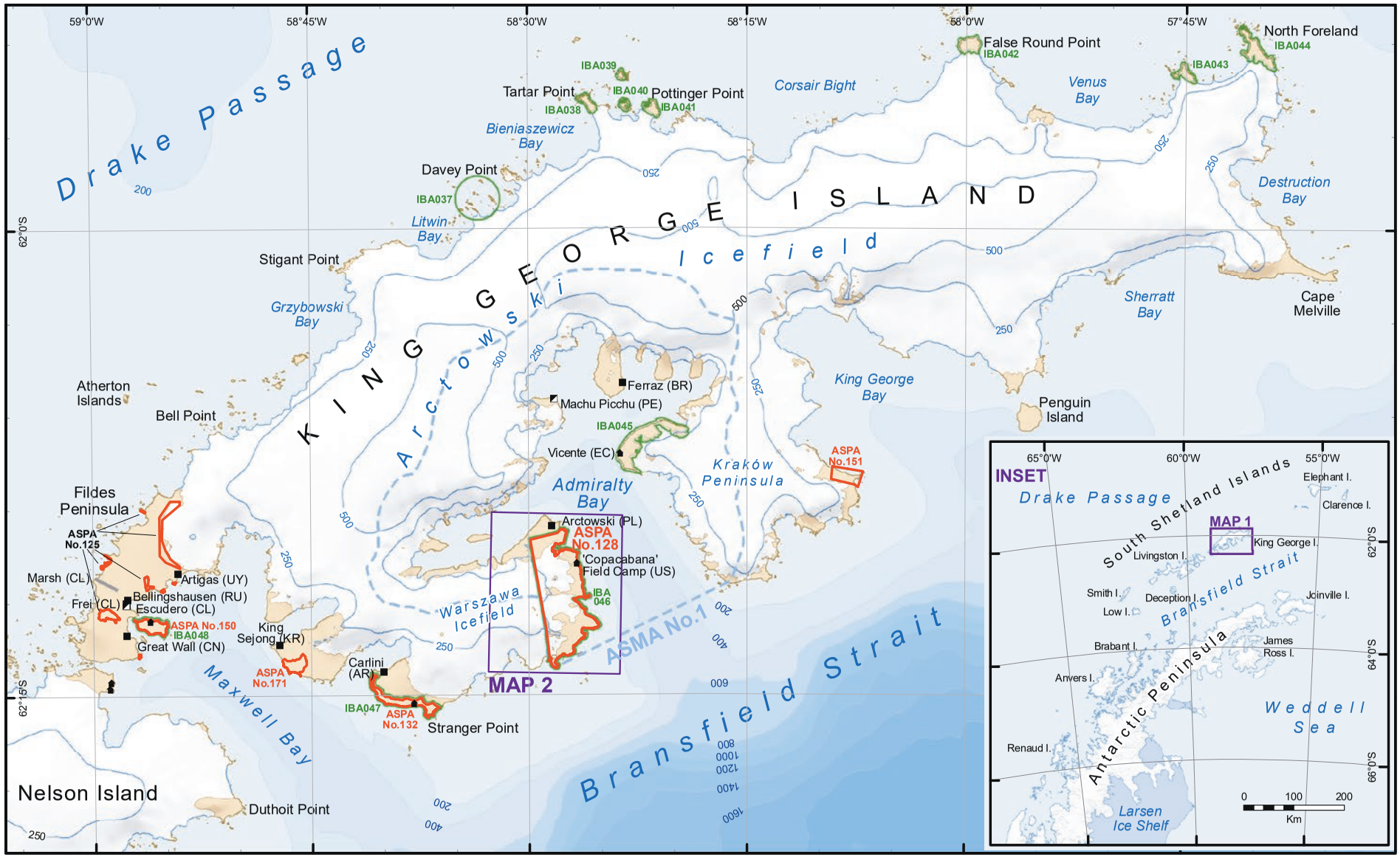


Map 1: ASPA No. 128 Western Shore of Admiralty Bay - Regional overview

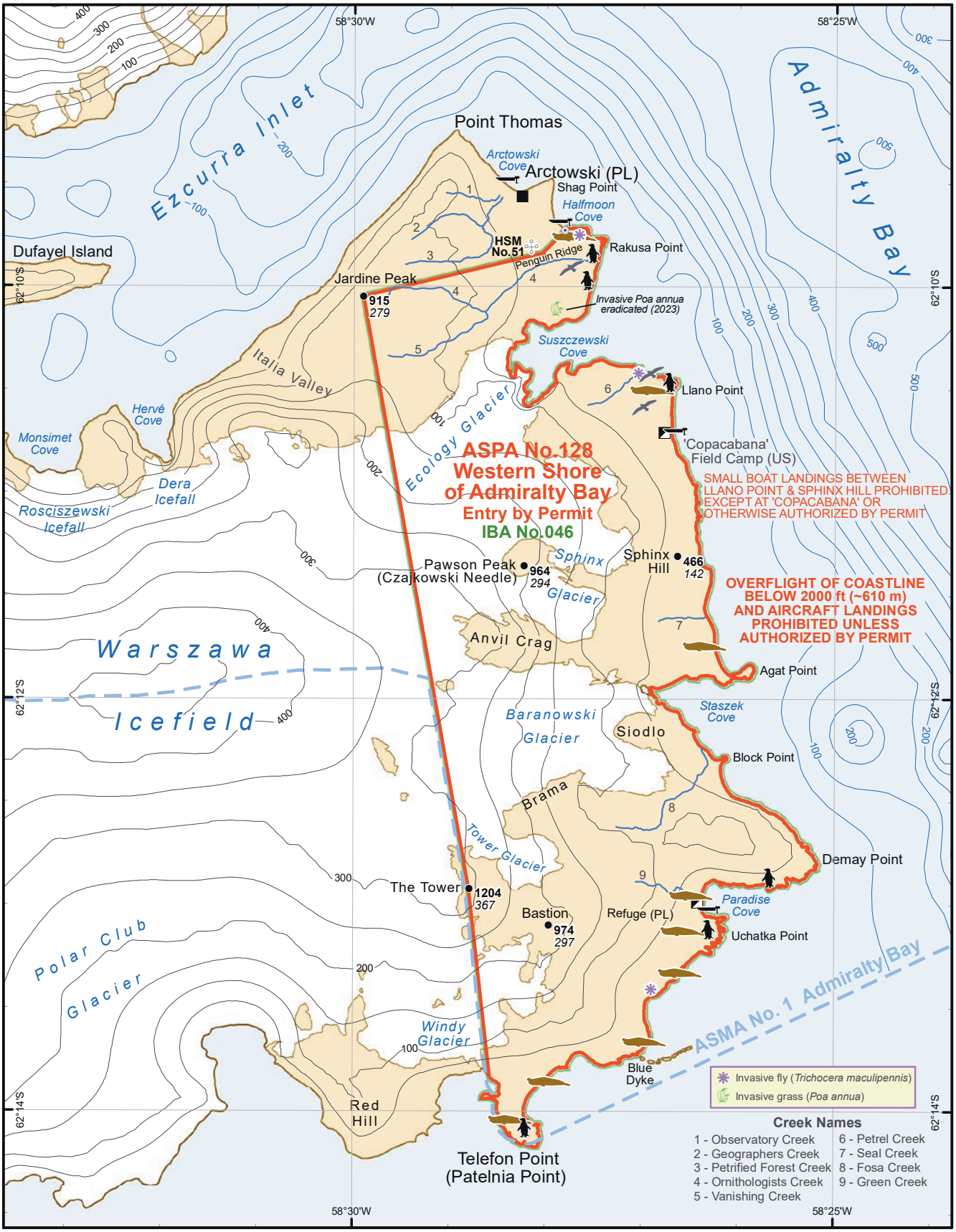
14 Feb 2024
Polish National Antarctic Program / United States Antarctic Program Environmental Research & Assessment

Permanent ice
Ice-free ground
Contour (250 m)
Isobath (200 m)
Station, Year-Round
Station, Seasonal
Field camp, Seasonal
Airstrip
Antarctic Specially Managed Area (ASMA) boundary
Antartic Specially Protected Area (ASPA) boundary
Important Bird Area (IBA)

0 5 10 Kilometers

N

Projection: Lambert Conic Conformal
Spheroid and Datum: WGS84
Data sources: Topography: ADD v.7.2; Bathymetry: IBCSO (2013); ASMA: Proantar; ASPA: ERA (2023); Stations: COMNAP 2023.



Map 2: ASPA No.128 Western Shore of Admiralty Bay - access, facilities and wildlife

0 0.5 1 Kilometers

N

11 Mar 2024
Polish National Antarctic Program / United States Antarctic Program
Environmental Research & Assessment

Permanent ice
Ice free ground
ASMA boundary
ASPA boundary
IBA boundary
ft / m Peak

Contour (50 m)
Isobath (50 m)
Coastline
Creek
Station (year round)
Field camp (seasonal)

Historic Site & Monument (HSM)
Marker
Small boat landing site
Penguin colony
Southern giant petrel colony
Southern elephant seal colony

Projection: Lambert Conformal Conic
Spheroid and horizontal datum: WGS84
Data sources: Topography, Stations: Proantar; ASMA: Proantar (updated by ERA 2023); ASPA boundary: ERA
Wildlife ERA / updated Bialik pers.comm. 2024;
Coastline / Creeks: ERA from WorldView orthoimagery supplied by PGC (© 2021-2024 Maxar Technologies);
Boat landing sites: Polish Antarctic Program.