



Management Plan

for Antarctic Specially Protected Area No. XXX WESTERN BRANSFIELD STRAIT and EASTERN DALLMANN BAY

Introduction

The Area comprises two separate marine sites located in the region of western Bransfield Strait and in Dallmann Bay, near Brabant Island, Palmer Archipelago. Site A (area ~1504 km²) is located off the western and southern coasts of Low Island, South Shetland Islands, lying between 63°10'S and 63°32'S; 61°50'W and 62°45'W. Site B (area ~710 km²) is located off the western and northern coasts of Brabant Island, between 63°53'S and 64°20'S, and between 62°16'W and 62°50'W. Designation is on the grounds that the shallow shelves in the region near Low Island and at eastern Dallmann Bay are the only two known sites in the vicinity of Palmer Station (USA) that are suitable for minimally invasive benthic sampling for fish and other organisms. The sites offer unique opportunities to study the composition, structure and dynamics of several accessible marine communities. Proposed by the United States of America: adopted by Recommendation XVI-3 (Bonn, 1991: SSSI No. 35); date of expiry extended by Measure 3 (2001); renamed and renumbered by Decision 1 (2002); revised management plans adopted by Measure 2 (2003), Measure 10 (2009), Measure 9 (2015) and Measure 10 (2015). The Area is approved under the Convention on the Conservation of Antarctic Marine Living Resources (CAMLR Convention) in accordance with Decision 9 (2005).

The Environmental Domains Analysis for Antarctica (Resolution 3 (2008)) and Antarctic Conservation Biogeographic Regions (Resolution 3 (2017)) classifications are based on terrestrial criteria, and therefore have limited applicability in marine environments. Four Important Bird Areas (IBAs) are located adjacent to but outside of the Area on Low Island.

1. Description of values to be protected

Western Bransfield Strait (between latitudes 63°20'S and 63°35'S and longitudes 61°45'W and 62°30'W, area ~916 km²) was originally designated as a Site of Special Scientific Interest through Recommendation XVI-3 (1991, SSSI No. 35). Eastern Dallmann Bay (between latitudes 63°53'S and 64°20'S and from longitude 62°48'W eastward to the western shore of Brabant Island, area ~610 km²) was originally designated as a Site of Special Scientific Interest through Recommendation XVI-3 (1991, SSSI No. 36). Both sites were proposed by the United States of America. The sites were renamed and renumbered as Antarctic Specially Protected Area (ASPA) No. 152 and ASPA No. 153 respectively by Decision 1 (2002). They were designated on the grounds that shallow shelves within these two areas were the only two known sites in the vicinity of Palmer Station that are suitable for minimally invasive benthic sampling for fish and other organisms. From an ecological standpoint, the sites offer unique opportunities to study the composition, structure, and dynamics of several accessible marine communities. The sites, and in particular their benthic fauna, are of exceptional scientific interest and require long-term protection from potential harmful interference. The Area is used in over 90 percent of specimen collections carried out by US researchers who are actively studying such fish communities within the region (Detrich pers. comms. 2022).

The boundaries of both ASPA No. 152 and ASPA No. 153 were revised by Measure 2 (2003) to include more of the shallow shelf down to ~200 m depth. The present management plan has merged ASPA No. 152 and ASPA No. 153 into a single ASPA, with the former ASPAs being referred to as Site A and Site B respectively (Map 1). The boundaries of the Area at Site A at Western Bransfield Strait have been further revised to include more of the shallow shelf between latitudes 63°10'S and 63°32'S and longitudes 61°50'W and 62°45'W and are defined in the northeast by the shoreline of Low Island, encompassing an area of ~1504 km² (Map 2). The boundaries of Site B at Dallmann Bay are between latitudes 63°53'S and 64°20'S and longitudes 62°16'W and 62°50'W and are defined in the east by the shoreline of Brabant Island, encompassing an area of ~710 km² (Map 3).

The Area continues to be considered important for obtaining scientific samples of fish and other organisms for studies of the composition, structure and dynamics of the marine communities, and the original reasons for designation are reaffirmed in the current Management Plan. In addition, the Area is recognized as an important spawning ground for several fish species, including the rockcod *Notothenia coriiceps* and the icefish *Chaenocephalus aceratus*. Fish have been collected from the Area by scientists from Palmer Station since the early 1970s. The Area is within the research area of the Palmer Long Term Ecological Research (LTER) Program; fish collected from the Area are used in the study of biochemical and physiological adaptations to low temperatures. Some of the fish collected have been used for comparative studies with the more heavily impacted Arthur Harbor area. Scientific research is also being undertaken on the benthic faunal communities.



2. Aims and objectives

Management at Western Bransfield Strait aims to:

- avoid degradation of, or substantial risk to, the values of the Area by preventing unnecessary human presence and disturbance in the Area;
- allow scientific research on the marine environment while ensuring protection from over-sampling;
- allow other scientific research within the Area provided it will not compromise the values for which the Area is protected;
- Allow visits for educational and outreach purposes (such as documentary reporting (visual, audio or written) or the production of educational resources or services) provided such activities are for compelling reasons that cannot be served elsewhere and will not compromise the values for which the Area is protected;
- 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:

- A map showing the location of the Area (stating the special restrictions that apply) shall be displayed prominently and copies of this Management Plan shall be made available at Palmer Station (United States).
- National programs shall ensure the boundaries of the Area and the restrictions that apply within are marked on relevant maps and nautical charts for which they are responsible.
- Copies of this Management Plan shall be made available to vessels operating within or over the Area, including those transiting, and the appropriate national authority shall inform relevant personnel on such vessels of:
 - the location, boundaries and restrictions applying within the Area;
 - the need for awareness of potential equipment deployed within the Area for scientific purposes, either at the surface or submarine. Such equipment may include buoys, 'high-flyer' buoys, with or without lights or radio beacons, or other equipment such as lines, nets or autonomous surface or submarine craft, or similar.
- Buoys or other markers or structures installed within the Area for scientific or management purposes shall be secured and maintained in good condition and removed when no longer needed.
- The Area shall be visited as necessary to assess whether it continues to serve the purposes for which it was designated and to ensure management and maintenance measures are adequate.

4. Period of designation

Designated for an indefinite period.

5. Maps and photographs

Map 1. ASPA No. XXX Regional overview. Coastline data are derived from the SCAR Antarctic Digital Database (ADD) Version 7.2 (2021). Bathymetry is derived from the International Bathymetric Chart of the Southern Ocean (IBCSO) v1.0 (2013). Bird data: Harris (2021). Important Bird Areas: BirdLife International (Harris *et al.* 2015).

Map specifications: Projection: Lambert Conformal Conic; Standard parallels: 1st 63°15'S; 2nd 64°00'S; Central Meridian: 62°00'W; Latitude of Origin: 65°00'S; Spheroid and horizontal datum: WGS84; Horizontal accuracy: maximum error of ±100 m. Principal isobath 200 m.

Inset: location of Map 1, ASPA No. XXX Site A Western Bransfield Strait, and Site B Eastern Dallmann Bay, Antarctic Peninsula.

Map 2. ASPA No. XXX: Site A Western Bransfield Strait. Map specifications: Projection: Lambert Conformal Conic; Standard parallels: 1st 63°15'S; 2nd 63°30'S; Central Meridian: 62°15'W; Latitude of Origin: 64°00'S; Spheroid and horizontal datum: WGS84; Horizontal accuracy: maximum error of ±100 m. Isobath interval 200 m.

Map 3. ASPA No. XXX: Site B Eastern Dallmann Bay. Map specifications: same as Map 2 except Standard parallels: 1st 64°00'S; 2nd 64°15'S; Central Meridian: 62°30'W, Latitude of Origin: 65°00'S.



6. Description of the Area

6(i) Geographical coordinates, boundary markers and natural features

Overview

Bransfield Strait is a deep water passage approximately 220 km long and 120 km wide between the Antarctic Peninsula and the numerous islands that comprise the South Shetland Islands. The Drake Passage is to the north and to the west is the Bellingshausen Sea. The Area comprises two marine sites (A and B) in the vicinity of western Bransfield Strait: Site A is located adjacent to Low Island, and Site B is located adjacent to Brabant Island (Map 1). Site A was formerly ASPA No.152 Western Bransfield Strait and Site B was formerly ASPA No.153 Eastern Dallmann Bay. These two ASPAs are merged in the current Management Plan because they share similar physical and ecological characteristics that are of scientific interest and the objectives of protection are identical for both sites.

Site A lies approximately 80 km west of the Antarctic Peninsula, mostly within the 200 m isobath directly south and west of Low Island (Map 1). Low Island is the southern-most of the South Shetland Islands, lying 60 km south-west of Deception Island and 25 km south-east of Smith Island. To the west and south of Low Island the sea floor slopes gently from the intertidal zone to depths of approximately 200 m out to ~20 km from shore. The sea floor slopes steeply to the east of Low Island, reaching depths of up to 1200 m in this part of Boyd Strait and Bransfield Strait. The sea floor within the Area is generally composed of muddy sediments containing gravel or small stones, and of sessile epifaunal communities (Troncoso *et al.* 2008), which either remain firmly attached to substrates or move very slowly (Robinson *et al.* 1996).

Site B is situated approximately 65 km west of the Antarctic Peninsula, between Brabant Island and Anvers Island, located largely within eastern Dallmann Bay; Bransfield Strait lies to the north and Gerlache Strait to the south (Map 1). Brabant Island is mountainous and mainly ice-covered, rising to 2520 m at Mount Parry. The western coastline comprises rock and ice cliffs and ice-free headlands, interspersed by steep boulder and narrow pebble beaches. Rock platforms are exposed at low tide in various locations north of Driencourt Point. Numerous rocky islets extend several kilometers offshore, including Astrolabe Needle (104 m) ~2 km south of Claude Point. West of Brabant Island the sea floor slopes moderately from the intertidal zone to depths of approximately 200 m before the slope descends to a depth of 400–600 m beyond the western boundary of Site B. The gradient from the shore down to 200 m slopes more gently in the north of Site B. Most of Site B lies within the 200 m depth contour west and north of Brabant Island (Map 1). The sea floor in the Area is generally composed of a matrix of soft sand, mud and cobbled-rock.

The boundaries of the Area are designed to protect scientific and ecological values present in the marine environment at depths down to 200 m. Restricting access to, and transit over, the sea surface is not considered necessary in order to protect these values, and for this reason both horizontal and vertical boundaries of the Area are defined (Figure 1).

Horizontal boundaries

The horizontal boundary is defined using a combination of lines of latitude and longitude and adjacent island coastlines, broadly approximating the area within the 200 m depth as defined by isobaths in the International Bathymetric Chart of the Southern Ocean (IBCSO v.1.0, 2013) (Map 1). These horizontal boundaries allow for easy identification of the Area when navigating, and represent a proxy for the marine area lying between 20 m and 200 m in depth.

Site A western Bransfield Strait extends a maximum of ~41 km north-south and ~46 km east-west, encompassing an area of ~1504 km² (Map 1). Site B eastern Dallmann Bay extends a maximum of ~50 km north-south and ~27.7 km east-west, encompassing an area of ~710 km².

Boundary markers have not been installed because in the marine area this is impractical, and the island coastlines are provide visually obvious boundary features.

Site A western Bransfield Strait boundary, line coordinates (Maps 1 and 2):

North (A to B): line of latitude at 63°10'S

Northeast (B to C): line of longitude at 62°10'W

Northeast (D to E): line of latitude at 63°20'W

East (E to F): line of longitude at 61°50'W

South (F to G): line of latitude at 63°32'S

West (G to A): line of longitude at 62°45'W.

Northeast: coastline of Low Island, extending from 63°15'S 62°10'W (C) in the north (near Cape Wallace) to 63°20'S 61°57.6'W (D) in the south (at Cape Hooker).



Site B eastern Dallmann Bay boundary, corner coordinates (Maps 1 and 3):

Northwest: 63°53'S 62°50'W (A).

North: 63°53'S 62°32'W (B); 63°57'S 62°32'W (C).

Northeast: 63°57'S 62°16'W (D); 64°02'S 62°16'W (E) (~3.7 km north of Duclaux Point).

South: 64°20'S 62°35'W (F) (Fleming Point); 64°20'S 62°40'W (G).

West (central): 64°12'S 62°40'W (H); 64°12'S 62°50'W (I) (west of Driencourt Point).

East: coastline of Brabant Island extending from Fleming Point (64°20'S 62°35'W) (F) to near Duclaux Point (64°02'S 62°16'W) (E) in Bouquet Bay.

Vertical boundaries

The upper vertical boundary of the Area is defined as a depth of 20 m (Figure 1), which takes into account the maximum draft of any shipping anticipated in the region. The lower vertical boundary is defined as the seafloor, which is of variable depth extending down to approximately 200 m within the Area (Map 1, Figure 1). The coastlines of Low Island and Brabant Island are used as pragmatic boundaries to define the lateral extent of the Area where the 20 m isobath configuration is uncertain.

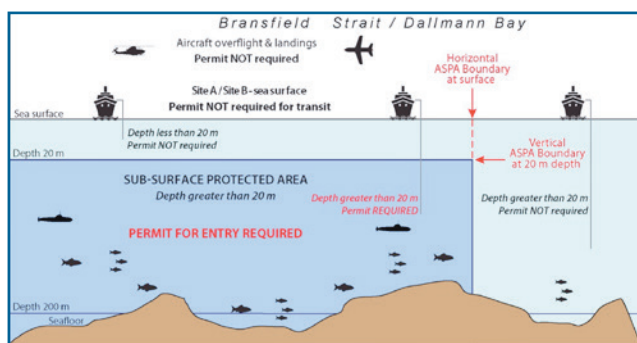


Figure 1. Definition of the vertical and horizontal extents of the sub-surface marine protected area at Site A Western Bransfield Strait and Site B Eastern Dallmann Bay (not to scale).

Oceanography, climate and marine geology

There is considerable year-to-year variation in sea ice within the Bransfield Strait region, although coverage appears to be less than 100 days per year (Parkinson 1998). Rates of sea ice advance and retreat along the northwestern Antarctic Peninsula are also variable. Sea ice advance is for approximately five months followed by approximately seven months of retreat. Ice growth is fastest in June and July and the fastest decay is in December and January (Stammerjohn and Smith 1996). Measurements made within the Bransfield Strait between 20th January and 9th February 2001 indicate that ocean temperatures in the Area averaged between 1.7 and 1.8 °C at 5 m depth and 0.2 to 0.3°C at the 150 m contour (Catalan *et al.* 2008). Water salinity within the Area ranged between 34.04 and 34.06 psu at 5 m, whilst at 150 m depth salinity reached 34.40 psu. Sea ice coverage averages approximately 140 days per year within Eastern Dallmann Bay and persists for approximately 82% of the winter period (Stammerjohn *et al.* 2008). Sea ice concentrations show considerable interannual variability, which has been linked to phase changes in ENSO and the Southern Annular Mode (SAM) (Stammerjohn *et al.* 2008).

Wind is predominantly from the NNW direction, resulting in a southward flowing coastal current along the western Antarctic Peninsula (Hofman *et al.* 1996). Coupled with the northward flow of the Antarctic Circumpolar Current, this results in a predominantly clockwise circulation in Bransfield Strait (Dinniman and Klinck 2004; Ducklow *et al.* 2007), dominated by the Gerlache Strait Current and the Bransfield Strait Current (Zhou *et al.* 2002; 2006). Drifters deployed as part of RACER (Research on Antarctic Coastal Ecosystems and Rates) between 1988 and 1990 indicate that eddy formation within Site A is minimal and that a strong north-easterly flow originates to the south of Low Island (Zhou *et al.* 2002). The current bifurcates to the west of Low Island, with water flowing to the north-east to merge with the Bransfield Strait Current and to the north-west, towards Smith Island. Local circulation is also influenced by tides, with tide records obtained at Low Island during a six-week period in December 1992 to January 1993 recording a maximum level variation of 1.70 m (López *et al.* 1994). There is an east – west flow within the northern part of Site B and the formation of eddies between Metchnikoff Point and Astrolabe Needle (Zhou *et al.* 2002). Tidal variation on Brabant Island is almost two meters and observations made while fishing indicate strong near-shore currents (Furse 1986).

Seismic measurements from the Seismic Experiment in Patagonia and Antarctica (SEPA) monitoring station, located on the north-eastern coast of Low Island, have detected significant earthquake activity within the Area, which is thought to result from the intersection of the Hero Fracture Zone with the South Shetland Platform at Smith Island (Maurice *et al.* 2003). During the Spanish Antarctic campaign of 2006/07, an additional seismic monitoring station was installed on the southern coast of Low Island, in order to extend geodetic monitoring within the Bransfield Strait area (Berrocoso *et al.* 2007).

Marine biology

The predominantly soft sand / mud / cobbled-rock substrate of the Area supports a rich benthos with numerous fish species, invertebrates (sponges, anemones, annelids, molluscs, crustaceans, asteroids, ophiuroids, echinoids, holothurioids, brachiopods, tunicates), and marine plants, in several distinct communities. Detailed information on the zooplankton or marine flora within the Area is not available.



Site A

Fish species commonly collected near Low Island at depths of 80 to 200m include *Chaenocephalus aceratus*, *Harpagifer bispinis*, *Notothenia coriiceps*, *Gobionotothen gibberifrons* (formerly *N. gibberifrons*), *Parachaenichthys charcoti* and *Trematomus newnesi* (Grove and Sidell 2004; Lau *et al.* 2001). Species rarely found at Low Island include *Champscephalus gunnari*, *Chionodraco rastrispinosus* and *Pseudochaenichthys georgianus*. In addition, the Low Island shelf appears to be a spawning ground for several fish species, for example the ice fish *Chaenocephalus aceratus* and *N. coriiceps*, with the family Nototheniidae, representing the bulk of fish larvae and juveniles captured in the area (Catalan *et al.* 2008). Other juvenile fish species collected close to Low Island include *Trematomus lepidorhynchus* and *Notothenia kempfi*. Site A is a mating ground for yellowbelly rockcod (*Notothenia coriiceps*) (indicated by eggs) (Kellermann 1996). The fish spawn in May / June. The large eggs, around 4.5 mm in diameter, are pelagic after fertilization and ascend to the surface waters where they incubate during the winter. Larval species recorded in Site A include *Bathylagus antarcticus*, *Electrona antarctica*, *Gymnodraco acuticeps*, *Nototheniops larseni*, *Notothenia kempfi* and *Pleuragramma antarcticum* (Sinque *et al.* 1986; Loeb *et al.* 1993; Morales-Nin *et al.* 1995).

Specimens collected during April–June 2008 and 2010 were used to investigate protein folding in *Gobionotothen gibberifrons* in relation to warming oceans (Cuellar *et al.* 2014).

The following benthic amphipod species have been recorded within Site A: *Ampelisca barnardi*, *A. bouvieri*, *Byblis subantarctica*, *Epimeria inermis*, *E. oxycarinata*, *E. walkeri*, *Eusirus antarcticus*, *E. perdentatus*, *Gitanopsis squamosa*, *Gnathiphimedia sexdentata*, *Jassa spp.*, *Leucothoe spinicarpa*, *Liljeborgia georgiana*, *Melphidippa antarctica*, *Oediceroides calmani*, *O. lahillei*, *Orchomenella zschaui*, *Parharpinia obliqua*, *Parepimeria bidentata*, *Podocerus septemcarinatus*, *Prostebbingia longicornis*, *Shackeltonia robusta*, *Torometopa perlata*, *Uristes georgianus* and *Waldeckia obesa* (Wakabara *et al.* 1995).

Molluscan assemblages have been analysed at four sample sites within the Area as part of an integrated study of the benthic ecosystem of Bransfield Strait, which was carried out between 24 January and 3 March 2003 (BENTART 03) and from 2 January to 17 February 2006 (BENTART 06) (Troncoso *et al.* 2008). The most abundant species in the Area was the bivalve *Lissarca notorcadensis*, distantly followed by *Pseudamauropsis aureolutea*, which was the most widely distributed. Other species collected included *Marseniopsis conica*, *Onoba gelida*, *Yoldiella profundorum*, *Anatoma euglypta*, *Chlanidota signeyana* and *Thyasira debilis*.

Site B

Fish commonly collected within a depth range of 80 to 200m at Eastern Dallmann Bay include *Gobionotothen gibberifrons*, *Chaenocephalus aceratus*, *Champscephalus gunnari*, *Pseudochaenichthys georgianus* and *Chionodraco rastrispinosus* (Eastman and Lannoo 2004; Dunlap *et al.* 2002). In addition to more common species, sampling carried out between 15th June and 4th July 2001 collected numerous specimens of *Lepidonotothen larseni*, *Lepidonotothen nudifrons*, *Notothenia rossii* and *Notothenia coriiceps* and examples of *Parachaenichthys charcoti*, *Chaenodraco wilsoni*, *Dissostichus mawsoni*, *Trematomus eulepidotus* and *Lepidonotothen squamifrons* (Eastman & Sidell 2002; Grove & Sidell 2004). Specimens of *Trematomus newnesi* and *Gymnodraco acuticeps* have been collected occasionally within Site B (Hazel & Sidell 2003; Wujcik *et al.* 2007). Larval species recorded at Site B include *Artedidraco skottsbergi*, *Gobionotothen gibberifrons*, *Lepidonotothen nudifrons* and *Pleuragramma antarcticum* (Sinque *et al.* 1986; Loeb *et al.* 1993).

Invertebrates collected at Site B have included varieties of sponge, anemone, annelid, mollusc, crustacean, asteroid, ophiuroid, echinoid, holothurioid and tunicate. Acoustic echo-sounding was used to measure aggregations of Antarctic krill (*Euphausia superba*) within Site B during cruises between 1985 and 1988 (Ross *et al.* 1996). Aggregations were generally recorded in the upper 120 m of the water column. The lowest numbers of aggregations were observed in early spring, increasing to a maximum in late summer and early winter and spawning occurs from November to March (Zhou *et al.* 2002). Site B provides a food-rich nursery for krill, which may become entrained within the vicinity by eddy currents.

Marine mammals

Satellite tracking studies carried out on humpback whales (*Megaptera novaeangliae*) between January 2004 and 2006 suggest that they pass close to Site A and may enter it during foraging, and numerous animals passed through Site B (Dalla Rosa *et al.* 2008). The broader Gerlache Strait region was identified as an important feeding ground. Southern elephant seals (*Mirounga leonina*) were tracked within Site A using satellite transmitters between December 1996 and February 1997 (Bornemann *et al.* 2000).

Numerous marine mammals were observed in Dallmann Bay between January 1984 and March 1985 (Furse 1986). Humpback whales (*Megaptera novaeangliae*) were the most frequently sighted whale species, with possible sightings of killer whales (*Orcinus orca*) off Metchnikoff Point in May and June 1985. Minke whales have been sighted to the north of Brabant Island during the austral summer (Dec – Feb) (Scheidat *et al.* 2008).

Crabeater seals (*Lobodon carcinophagus*), southern elephant seals (*Mirounga leonina*), numerous Antarctic fur seals (*Arctocephalus gazella*), leopard seals (*Hydrurga leptonyx*) and Weddell seals (*Leptonychotes weddellii*) have been observed near Metchnikoff Point (Furse 1986).



Birds

Approximately 300 000 pairs of chinstrap penguins (*Pygoscelis antarcticus*) breed at ~13 locations on and near to the shore of Low Island (Harris 2021), most of which are in colonies located along or near the northeastern boundary of Site A. The largest colonies near Site A are at Cape Wallace (~40 000 pairs), Cape Garry (~210 000 pairs), Jameson Point (~33 000 pairs) and Cape Hooker (~15 200 pairs) (Map 2). These breeding sites have been identified by BirdLife International as Important Bird Areas because of their large chinstrap penguin colonies (Harris *et al.* 2015). It is expected that the large colonies of chinstrap penguin influence Site A. Small colonies of Imperial shags (*Leucocarbo atriceps bransfieldensis*) have been observed at Cape Garry, on an island between Cape Garry and Jameson Point, and on an island near Cape Wallace (Poncet and Poncet, unpublished data Feb 1987, in Harris 2021) (Map 2).

Two colonies of chinstrap penguin have been recorded on the northwestern coast of Brabant Island adjacent to Site B. Approximately 5000 pairs were counted at Metchnikoff Point and approximately 250 pairs at Claude Point in 1985 (Woehler 1993). Colonies of Antarctic fulmars (*Fulmarus glacialisoides*) have been observed on the northern coast of Brabant Island (Poncet and Poncet, unpublished data: in Harris 2021) and 1000 pairs were estimated to be nesting along Cape Cockburn cliffs in 1987, near the northeastern boundary of Site B (Creuwels *et al.* 2007). Antarctic shags (*Leucocarbo atriceps bransfieldensis*) have been observed breeding at four locations along the western coast of Brabant Island (Poncet & Poncet, unpublished data from Jan-Feb 1987, in Harris 2021). Other birds observed breeding on the western coast of Brabant Island and frequenting Site B are: Antarctic terns (*Sterna vittata*), Black-bellied storm petrels (*Fregetta tropica*), Brown skuas (*Catharacta antarctica*), Cape petrels (*Daption capense*), Snowy sheathbills (*Chionis alba*), Kelp gulls (*Larus dominicanus*), Snow petrels (*Pagodroma nivea*), South polar skuas (*Catharacta maccormicki*) and Wilson's storm petrels (*Oceanites oceanicus*) (Parmelee & Rimmer 1985; Furse 1986). Antarctic petrel (*Thalassoica antarctica*), Black-browed albatross (*Diomedea melanophrys*), Southern giant petrel (*Macronectes giganteus*) commonly forage in the Area (Furse 1986).

Human activities / impacts

Fish collected within the Area have been used for a variety of biochemical, genetic and physiological research, including: studies of the adaptations in fish that enable proteins to function at low temperatures (Detrich *et al.* 2000; Cheng and Detrich 2007); the adaptations of muscle and energy metabolism, including the processing of fatty acids to low temperatures (Hazel and Sidell 2003; Grove and Sidell 2004); efficient genome transcription in cold water (Lau *et al.* 2001; Magnoni *et al.* 1998); the influence of hydrostatic pressure on enzyme function within fish livers (Ciardiello *et al.* 1999); cardiovascular adaptations of icefishes, in compensation for their complete lack of haemoglobin (Sidell and O'Brien 2006); and biochemical processes in icefish (Cuellar *et al.* 2014; Devor 2013; Mueller *et al.* 2011; Mueller *et al.* 2012; Teigen 2014).

Specimens collected during sampling in March and April 1991, 1992, and 1993 were used in comparative studies of Polynuclear Aromatic Hydrocarbon (PAH) contamination in fish with those collected from Arthur Harbor and the effects of Diesel Fuel Arctic (DFA) on *Notothenia gibberifrons* (now *Gobionotothen gibberifrons*) (McDonald *et al.* 1995; Yu *et al.* 1995). The former study found levels of contamination in fish sampled from the Area were considerably lower than those sampled from the vicinity of the 1989 *Bahia Paraiso* wreck in Arthur Harbor and that fish captured near US scientific stations are exposed to PAH, albeit low levels (McDonald *et al.* 1992 and 1995). However, concentrations of PAH were higher than had been expected in fish collected from within the Area, with levels found to be similar to those in fish sampled from near Old Palmer Station.

A British Joint Services Expedition involving 35 team members spent one year on Brabant Island from January 1984 to March 1985 (Furse 1986). Several camps and numerous caches were established along the western coastline, including a main base camp at Metchnikoff Point. Some of the camp structures, equipment and supplies were abandoned following the expedition. A large amount of visible waste from the expedition was cleaned up by the UK in 2017, although due to ice cover and the dispersal of small fragments it was not possible at that time to remove all traces of the expedition (United Kingdom 2017). The UK aims to revisit the site in the future to complete the clean-up. The level of impact of the expedition on the terrestrial and adjacent marine environments is unknown.

The Brabant Island – Anvers Island region is popular for tourism and visits are made regularly to Dallmann Bay, and in particular Metchnikoff Point (Table 1, Section 8). It is not clear where in Dallmann Bay the reported tourist visits took place, although it is thought that ship activity occurs predominantly within western Dallmann Bay, specifically along the coast of Anvers Island and close to the Melchior Islands (Crosbie pers. comm. 2008). In February 2010 a vessel collided with and injured a humpback whale during approach to Dallmann Bay (Liggett *et al.* 2010).

6(ii) Access to the Area

Access to the Area is generally by ship from Bransfield Strait, Drake Passage, Boyd Strait, or Gerlache Strait. Access to the Area may be made by air or over sea ice when conditions allow. Access routes into or within the Area have not been defined. Specific access policies are set out in Section 7(ii) below.

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

There are no structures known to be within or near Site A. Structures and other material from the UK Joint Services Expedition to Brabant Island (January 1984 to March 1985) may remain near Site B on the western shores of Brabant Island, notably at Metchnikoff Point. The nearest scientific stations to Site A are Decepción (Argentina) and Gabriel de Castilla (Spain), both ~70 km to the northeast on Deception Island. The nearest stations to Site B are: Melchior (Argentina), Melchior Islands, Dallmann Bay ~15 km southwest; Primavera (Argentina) ~65 km east; and to the southwest Gabriel González Videla (Chile) ~55 km, Port Lockroy (UK) ~75 km, Yelcho (Chile) ~80 km, and Palmer (US) ~90 km.



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

The nearest protected areas to Site A Western Bransfield Strait and Site B Eastern Dallmann BayPort Foster and other parts of Deception Island (ASPAs No. 145 and No. 140 respectively), which lie ~70 km to the northeast, and ASPA No. 134 Cierva Point which lies ~65 km to the southeast (Map 1, Inset). Antarctic Specially Managed Area No. 7 Southwest Anvers Island and Palmer Basin lies ~80 km to the southwest on the southern coast of Anvers Island (Map 1).

6(v) Special zones within the Area

None.

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 to enter the Area are that:

- it is issued only for scientific purposes, in particular for research on the marine environment and ecosystem, or for educational purposes that cannot be served elsewhere, or for reasons essential to the management of the Area such as inspection, maintenance or review;
- the actions permitted are in accordance with the Management Plan;
- the activities permitted will give due consideration via the environmental impact assessment process to the continued protection of the environmental and scientific values of the Area;
- it is issued for compelling educational or outreach purposes that cannot be served elsewhere, and which do not conflict with the objectives of this Management Plan;
- the permit shall be issued for a finite period;
- the permit, or a copy, shall be carried when accessing the Area.

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

- Access to, and movement within or over, the sea surface above the sub-surface boundary of the Area (Figure 1) by boat, vehicle, aircraft, or on foot are not subject to any special restrictions and do not require a permit.
- There are no specific restrictions on routes of access into, or movement within, the sub-surface Area, although movements should be kept to the minimum necessary consistent with the objectives of any permitted activity. Every reasonable effort should be made to minimize disturbance.
- Surface vessels operating over the Area are prohibited from anchoring within the Area, except in compelling circumstances when a permit to anchor may be granted in support of meeting:
 - the objectives of the Area; or
 - scientific or management needs within the Area; or
 - scientific or management needs in terrestrial areas adjacent to the boundaries of the Area.
- There are no special overflight restrictions over the Area, and piloted aircraft may land when sea ice conditions allow, although pilots should take into account the large penguin colonies present near the boundaries of the Area, particularly on the coast of Low Island (Map 1).
- There are no special restrictions on use of Remotely Piloted Aircraft Systems (RPAS) over the Area, although pilots 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 in the Area

- Scientific research that will not jeopardize the values of the Area;
- Activities with educational and / or outreach purposes (such as documentary reporting (e.g. visual, audio or written) or the production of educational resources or services) that are for compelling reasons which cannot be served elsewhere;
- Essential management activities, including monitoring and inspection.



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 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 clean as required under Section 7(vi), and made of materials that pose minimal risk of contamination of the Area;
- Equipment deployed within the Area for scientific purposes should be identifiable by vessels operating in the vicinity by aids such as flags, lights or radio beacons to the maximum extent practicable. Scientists deploying such equipment should, to the extent practicable, notify other vessels operating in the vicinity at the time at which deployments are being made.
- Installation (including site selection), maintenance, modification or removal of structures or equipment shall be undertaken in a manner that minimizes disturbance to flora and fauna.
- Removal of specific structures or 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

None.

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 which 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 scientific and / or logistic structures, equipment and markers brought into the Area are clean. To the maximum extent practicable, equipment to be used within the area shall be thoroughly cleaned before entering the Area. Visitors should also consult and follow as appropriate recommendations contained in the Committee for Environmental Protection Non-native Species Manual (Resolution 4 (2016); CEP 2019);
- Poultry and all poultry products are prohibited from the Area;
- Herbicides and pesticides are prohibited from the Area;
- Any other chemicals, including radio-nuclides or stable isotopes, which may be introduced for scientific or management purposes specified in the permit, shall be limited to such quantities that will have no significant impact on the values of the Area;
- Fuel, food, and other materials shall not be stored in the Area, unless required for essential purposes connected with the activity for which the permit has been granted. In general, all materials introduced shall be for a stated period only and shall be removed at or before the conclusion of that stated period;
- All materials shall be stored and handled so that risk of their introduction into the environment is minimized; 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 or fauna is prohibited, except in accordance with a permit issued under Article 3 of Annex II to 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 and rock or seafloor specimens.
- Material of human origin likely to compromise the values of the Area, which was not brought into the Area by the permit holder or otherwise authorized, may be removed from any part of 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 should be notified and approval obtained.
- The appropriate national authority should be notified of any items removed from the Area that were not introduced by the permit holder.

7(ix) Disposal of waste

All wastes, including human wastes, shall be removed from the Area.



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:

- carry out monitoring and Area inspection activities, which may involve the collection of a small number of samples or data for analysis or review;
- Erect, install, deploy or maintain structures or scientific equipment;
- Carry out protective measures.

7(xi) Requirements for reports

- The principal permit holder for each visit to the Area shall submit a report to the appropriate national authority as soon as practicable after the visit has been completed in accordance with national procedures.
- 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 Party 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 reports in a publicly accessible archive to maintain a record of usage, to be used both in any review of the Management Plan and in organizing the scientific use of the Area.
- The appropriate authority should be notified of any activities / measures that might have exceptionally been undertaken, or anything removed, or anything released and not removed, that were not included in the authorized permit.

8. Supporting documentation

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Table 1. Tourism activity in the vicinity of Site B, Eastern Dallmann Bay, 1991/92 to 2019/20. Numbers given in brackets indicate activity at Metchnikoff Point.

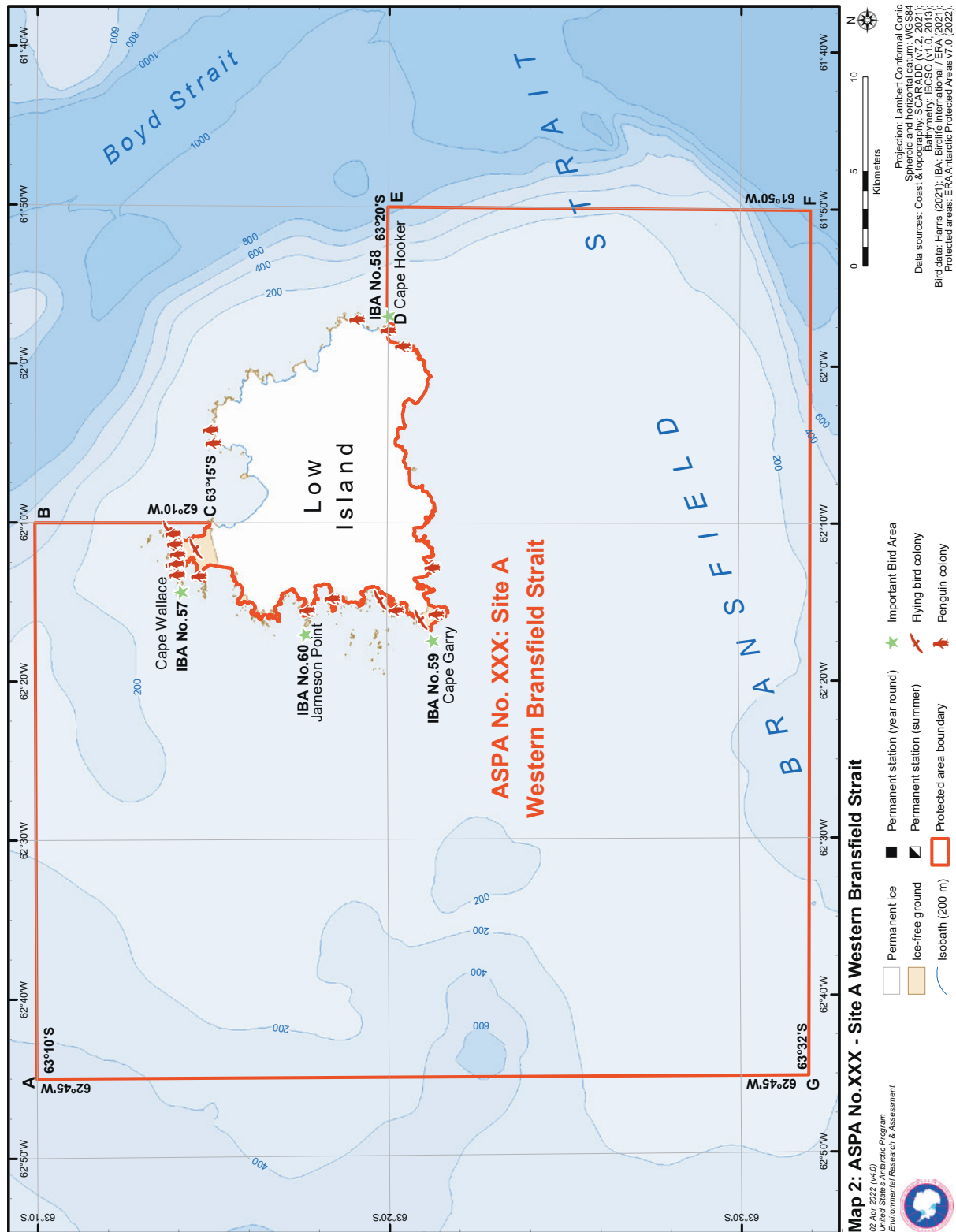
Year	No. of vessels	Total No. of Visitors	Small-boat cruise (pax)	Small-boat landing (pax)	Helicopter flight	Kayaking	Scuba diving
1991-92	(1)		(12)				
1992-93							
1993-94	1		84				
1994-95							
1995-96	2		104				
1996-97	1		70				
1997-98	(1)			(55)			
1998-99	(1)			(2)			
1999-00	2		102				
2000-01	0		0				
2001-02	(1)		0 (96)				
2002-03	0		0				
2003-04	0	0	0	0	0	0	0
2004-05	1	56	0	0	0	0	0
2005-06	7	1399	467	0	0	107	0
2006-07	8	1232	318	0	0	101	0
2007-08	8	10,068	61	0	0	0	0
2008-09	9	6545	170	0	0	0	0
2009-10	9	13,759	107	0	0	0	0
2010-11	9	2402	103	0	26	0	14
2011-12	4	2131	78	0	0	0	0
2012-13	8	3715	0	4	0	0	0
2013-14	9	3558	29	0	0	0	0
2014-15		5273	120	8	0	8	0
2015-16		5351	363	0	0	56	0
2016-17		10376	12	0	0	7	0
2017-18		6168	0	0	0	0	0
2018-19		7136	0	0	0	0	0
2019-20		11053	10	0	0	5	0

Data source: IAATO 2021.



- Projection: Lambert Conformal Conic
Spheroid and horizontal datum: WGS84
Data sources: Coast & topography: SCAR ADD
(v7.2 2021); Bathymetry: IBCSO (v1.0, 2013)
Areas: ERA Antarctic Protected Areas v7.0 (2022).

Protected areas: ERA Antarctic Protected Areas v7.0 (2022).





Map 3: ASPA No. XXX - Site B Eastern Dallmann Bay

02 Apr 2022 (v4.0)
United States Antarctic Program
Environmental Research & Assessment



- | | | |
|-----------------|--------------------------------|---------------------|
| Permanent ice | Permanent station (year round) | Important Bird Area |
| Ice-free ground | Permanent station (summer) | Flying bird colony |
| Isobath (200 m) | Protected area boundary | Penguin colony |

0 5 10
Kilometers

Projection: Lambert Conformal Conic
Spheroid and horizontal datum: WGS84
Data sources: Coast & topography: SCAR ADD (v7.2, 2021);
Bathymetry: IBCSO (v1.0, 2013);
Bird data: Harris (2021); IBA: Birdlife International / ERA (2021);
Protected areas: ERA Antarctic Protected Areas v7.0 (2022).