

**Management Plan for
Antarctic Specially Protected Area No. 153
EASTERN DALLMANN BAY**

1. Description of values to be protected

Eastern Dallmann Bay (between latitudes 64°00'S and 64°20'S and from longitude 62°50'W eastward to the western shore of Brabant Island, approximately 520 km²) was originally designated as a Marine Site of Special Scientific Interest through Recommendation XVI-3 (1991, SSSI No. 36) after a proposal by the United States of America. It was designated on the grounds that “the shallow shelf west of East Dallmann Bay is one of only two known sites near Palmer Station that are suitable for bottom trawling for fish and other benthic organisms. The Site and, in particular, its benthic fauna, are of exceptional scientific interest and require long-term protection from harmful interference”.

New bathymetric data compiled for the Area since its original designation show that the original boundary failed to encompass part of the shallow shelf above 200 m depth to the north of Brabant Island. It also included deeper water down to ~ 300-350 m in the west of the original Area, which is not considered strictly pertinent to the values identified for the Area. The boundaries of the Area have therefore been revised to focus more specifically on the shallow shelf down to 200 m depth to the west and north of Brabant Island, while the deeper water of Dallmann Bay to the west has now been excluded. This has resulted in a shift of the western boundary by approximately eight kilometers to the east, and the northern boundary by about 14 kilometers to the north, although the overall size of the Area has not been significantly altered. The new boundaries of the Area at Dallmann Bay are between latitudes 63°53'S and 64°20'S and longitudes 62°16'W and 62°45'W and are defined in the east by the shoreline of Brabant Island, encompassing an area of approximately 580 km² (Map 1).

The Area continues to be considered important for obtaining scientific samples of fish and other benthic organisms, and the original reasons for designation are reaffirmed in the current Management Plan with the amended boundaries. In addition, the Area is an important habitat for juvenile 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 Harbour area. Scientific research is also being undertaken on the benthic faunal communities.

2. Aims and objectives

Management at Eastern Dallmann 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 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 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 (USA).
- Copies of this Management Plan shall be made available to vessels traveling in the vicinity of the Area.
- Buoys, or other markers or structures installed within the Area for scientific or management purposes shall be secured and maintained in good condition.
- Visits shall be made as necessary to assess whether the Area 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. 153 Eastern Dallmann Bay bathymetric map. Coastline data are derived from the SCAR Antarctic Digital Database Version 2.0. Bathymetric is derived from published and unpublished depth data gridded by Morris (British Antarctic Survey, pers. comm. 2000) to the same specifications described in Schenke *et al.* (1998), which was gridded to cell sizes of between 1 and 4.6 km. Map specifications:

Projection: Lambert Conformal Conic; Standard parallels: 1st 62° 00' S; 2nd 64° 00' S;

Central Meridian: 62° 00' W; Latitude of Origin: 63° 00' S; Spheroid: WGS84;

Horizontal accuracy: maximum error of ±300 m.

Vertical contour interval 100 m, vertical accuracy to within ±50 m.

Inset: the location of Map 1, ASPA No. 153 Eastern Dallmann Bay, Antarctic Peninsula, showing the nearest protected area, ASPA No. 152, Western Bransfield Strait, and the location of Palmer Station (US).

6. Description of the Area

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

GENERAL DESCRIPTION

Dallmann Bay (between latitudes 64°00'S and 64°20'S and from longitude 63°15'W eastward to the western shore of Brabant Island) is situated approximately 65 km west of the Antarctic Peninsula, between Brabant Island and Anvers Island, with Bransfield Strait to the north and Gerlache Strait to the south. Brabant Island is predominantly ice-covered, with a high north-south mountain chain which falls steeply to the sea on the western coast. The western coastline is characterized by rock and ice cliffs and ice-free headlands, interspersed by steep boulder and pebble beaches. Rock platforms are exposed at low tide in various locations north of Driencourt Point (Map 1). Numerous rocky islets extend several kilometers offshore, including Astrolabe Needle (104 m) which stands one kilometer offshore, two kilometers 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 eases to depths of 400-500 m beyond the western boundary of the Area. The gradient from the shore down to 200 m slopes more gently in the north of the Area. The Area lies mostly 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.

BOUNDARIES

The designated Area is defined in the south by latitude 64°20'S, extending from Fleming Point westward for two kilometers to 62°40'W. From this location, the western boundary extends due north on longitude 62°40'W for 18.5 km to 64°10'S, SSW of Astrolabe Needle. The western boundary then extends NNW almost 19 km to 62°45'W, 64°00'S. The western boundary then extends approximately 13 km due north on longitude 62°45'W to latitude 63°53'S, the northern boundary of the Area. The northern boundary extends along latitude 63°53'S from 62°45'W to 62°16'W, being a distance of approximately 23.4 km. The eastern boundary extends due south approximately 16 km from 62°16'W, 63°53'S to the eastern extremity of Pasteur Peninsula, Brabant Island, at 62°16'W, 64°02'S. From there, the eastern boundary is defined as the mean high water mark of the northern and western coastline of Brabant Island, which includes the

intertidal zone within the Area. The Area is 50 km from north to south and extends up to a maximum of 23.4 km east-west. West of Brabant Island the width of the Area ranges between 10 km (at Guyou Bay) and 1.5 km (near Claude Point). The total area is approximately 580 km².

OCEANOGRAPHY AND CLIMATE

Regional winds are predominantly from the NNW, producing a southward oceanic flow along the western Antarctic Peninsula. Coupled with the northward flow of the Antarctic Circumpolar Current, this results in a predominantly clockwise oceanic circulation along the western Antarctic Peninsula (Hofmann *et al.* 1996). Circulation patterns in Dallmann Bay, however, are unknown. Sea ice coverage in Dallmann Bay appears to average less than 150 days per year, although there is considerable inter-annual variation (Parkinson, 1988). Tidal variation on Brabant Island is almost two meters and observations made while fishing indicate strong near-shore currents (Furse, 1986). Measurements made in the Area during four hydrographic cruises between November 1986 and March 1987 indicated water temperatures between minus 0.9°C in December to 0.9°C in February with salinity measurements averaging between 33.6 ‰ and 33.8 ‰ within the top 20 m of the water column (Niiler *et al.* 1991).

MARINE BIOLOGY

The Area supports a rich benthic community including numerous fish species, invertebrates, and marine plants and the Area is an important habitat for juvenile fish species. Fish commonly collected at Eastern Dallmann Bay include *Notothenia gibberifrons*, *Chaenocephalus aceratus*, *Champscephalus gunnari*, *Pseudochaenichthys georgianus* and *Chionodraco rastrispinosus*. Specimens of *Trematomus newnesi* and *Notothenia coriiceps* have only rarely been collected in this area. Larval species recorded in the Area include *Artedidraco skottsbergi*, *Notothenia gibberifrons*, *N. nudifrons* and *Pleuragramma antarcticum* (Sinque *et al.*, 1986; Loeb *et al.*, 1993). Invertebrates collected within the Area 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 the Area 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.

BIRDS

Two colonies of chinstrap penguins (*Pygoscelis antarctica*) have been recorded on the northwestern coast of Brabant Island immediately adjacent to the Area. Approximately 5000

breeding pairs were counted at Metchnikoff Point in 1985 and approximately 250 pairs at Claude Point in 1985 (Woehler, 1993). Other birds observed breeding on the western coast of Brabant Island and frequenting the Area are: Antarctic fulmars (*Fulmaris glacialisoides*), Antarctic terns (*Sterna vittata*), black-bellied storm petrels (*Fregetta tropica*), blue-eyed cormorants (*Phalacrocorax atriceps*), brown skuas (*Catharacta loennbergi*), cape pigeons (*Daption capense*), greater sheathbills (*Chionis alba*), kelp gulls (*Larus dominicanus*), snow petrels (*Pagodroma nivea*), south polar skuas (*Catharacta maccormicki*) and Wilson's storm petrels (*Oceanites oceanicus*) (Parmelee and Rimmer, 1985; Furse, 1986). Antarctic petrel (*Thalassoica antarctica*), black-browed albatross (*Diomedea melanophris*), southern giant petrel (*Macronectes giganteus*) commonly forage in the Area (Furse, 1986).

MARINE MAMMALS

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. Crabeater seals (*Lobodon carcinophagus*), southern elephant seals (*Mirounga leonina*), numerous Antarctic fur seals (*Arctocephalus gazella*), leopard seals (*Hydrurga leptonyx*) and Weddell seals (*Leptonychotes weddelli*), were observed in the Area from Metchnikoff Point.

HUMAN ACTIVITIES / IMPACTS

Numerous research cruises along the western Antarctic Peninsula have included sampling stations within the Area for oceanographic and/or biological research. 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 (e.g. Detrich, 1987; Detrich and Parker, 1991; Detrich and Parker, 1993); the adaptations of muscle and energy metabolism to low temperatures; and for comparative studies of polynuclear aromatic hydrocarbon (PAH) contamination in fish with those collected from Arthur Harbor (McDonald *et al.*, 1992). The latter 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 Harbour. 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 and possibly caches were abandoned following the expedition, although their status in 2002 is unknown. The level of impact of the expedition on the adjacent marine environment is also unknown.

The Brabant Island – Anvers Island region is popular for tourist ships. Data on tourist visits compiled by the US National Science Foundation show that since the Area was first designated in 1991 a number of tour vessels have visited Dallmann Bay, and more specifically Metchnikoff Point. Tourist activity in the vicinity since original designation is summarised in Table 1. It is not clear where in Dallmann Bay the reported tourist visits took place, although it has been, and still is, necessary to move through the Area to gain access to Metchnikoff Point by sea.

Table 1. Tourist activity in the vicinity of ASPA No. 153 Eastern Dallmann Bay 1991-92 – 2000-01.

Season	Number of tour vessels and passengers (pax)					
	Dallmann Bay			Metchnikoff Point		
	No. of vessels	Small-boat cruise (pax)	Small-boat landing (pax)	No. of vessels	Small-boat cruise (pax)	Small-boat landing (pax)
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						
TOTALS	6	360		3	12	57

6(ii) Restricted and managed zones within the Area

None.

6(iii) Structures within and near the Area

There are no structures known to be within the Area. Structures and other material from the UK Joint Services Expedition to Brabant Island (January 1984 to March 1985) may remain on the western shores of Brabant Island, particularly at Metchnikoff Point. The nearest stations are

President González Videla (Chile), approximately 55 km south in Paradise Harbour; Port Lockroy (UK), approximately 75 km south-west on Goudier Island, Yelcho (Chile), approximately 80 km south-west on Doumar Island; and Palmer (USA), approximately 90 km WSW on Anvers Island.

6(iv) Location of other protected areas within close proximity of the Area

The nearest protected areas to Eastern Dallmann Bay are Western Bransfield Strait (ASPA No. 152), which lies about 55 km to the NNW, and Biscoe Point (ASPA No. 139) and Litchfield Island (ASPA No. 113), both of which lie approximately 80 km to the south-west on the southern coast of Anvers Island (Map 1).

7. 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 are that:

- it is issued for at least one of the following purposes:
 - for scientific study of the marine environment in the Area, or for other scientific study which will not compromise the values for which the Area is protected, and/or
 - for essential management purposes consistent with plan objectives such as inspection, maintenance or review
- the actions permitted will not jeopardize the values of the Area;
- any management activities are in support of the objectives of the Management Plan;
- the actions permitted are in accordance with the Management Plan;
- the Permit, or an authorized copy, shall be carried within the Area;
- a visit report shall be supplied to the authority named in the Permit;
- permits shall be issued for a stated period;
- the appropriate authority should be notified of any activities/measures undertaken that were not included in the authorised Permit.

7(i) Access to and movement within the Area

Access into the Area shall be by sea, over sea ice or by air. There are no specific restrictions on routes of access to or movement within the 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. Anchoring should be avoided within the Area. There are no special overflight restrictions and aircraft may land by Permit when sea ice conditions allow.

7(ii) Activities that are or may be conducted in the Area, including restrictions on time or place

- Scientific research that will not jeopardize the values of the Area;
- Essential operational activities of vessels that will not jeopardize the values of the Area, such as transit through, or stationing within, the Area in order to facilitate science or other activities or for access to sites outside of the Area;
- Essential management activities, including monitoring;

7(iii) Installation, modification or removal of structures

Structures or scientific equipment shall not be installed within the Area except as specified in a Permit. All markers, structures or scientific equipment installed in the Area shall be clearly identified by country, name of the principal investigator and year of installation. All such items should be made of materials that pose minimal risk of contamination of the Area. Removal of specific equipment for which the Permit has expired shall be a condition of the Permit. Permanent installations are prohibited.

7(iv) Location of field camps

None.

7(v) Restrictions on materials and organisms which can be brought into the Area

No living animals, plant material, pathogens or microorganisms shall be deliberately introduced into the Area. No herbicides or pesticides shall be introduced into 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 used in the minimum quantities necessary to achieve the purpose of the activity for which the Permit was granted. Anything introduced shall be for a stated period only, shall be removed to the maximum extent practicable at or before the conclusion of that stated period, and shall be stored and handled so that risk of any introduction into the environment is minimized. If release occurs which is likely to compromise the values of the Area, removal or remediation is encouraged only where the impact of removal or remediation is not likely to be greater than that of leaving the material *in situ*. The appropriate authority should be notified of any materials released that were not included in the authorized Permit.

7(vi) Taking or harmful interference with native flora or fauna

Taking or harmful interference with native flora or fauna is prohibited, except by Permit issued in accordance with Annex II to the Protocol on Environmental Protection to the Antarctic Treaty. Where taking or harmful interference with animals is involved, the *SCAR Code of Conduct for the Use of Animals for Scientific Purposes in Antarctica* should be used as a minimum standard.

7(vii) Collection or removal of anything not brought into the Area by the Permit holder

Collection or removal of anything not brought into the Area by the Permit holder shall only be in accordance with a Permit and should be limited to the minimum necessary to meet scientific or management needs. Permits shall not be granted if there is a reasonable concern that the sampling proposed would take, remove or damage such quantities of substrate, native flora or fauna that their distribution or abundance within the Area would be significantly affected. Anything 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 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.

7(viii) Disposal of waste

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

7(ix) Measures that are necessary to ensure that the aims and objectives of the Management Plan can continue to be met

1. Permits may be granted to enter the Area to carry out biological monitoring and site inspection activities, which may involve the collection of limited samples for analysis or review, or for protective measures.
2. Any specific sites of long-term monitoring that are vulnerable to inadvertent disturbance should, where practical, be appropriately marked on site and on maps of the Area.

7(x) Requirements for reports

Parties should ensure that the principal holder for each Permit issued submits to the appropriate authority a report describing the activities undertaken. Such reports should include, as appropriate, the information identified in the Visit Report form suggested by SCAR. Parties should maintain a record of such activities and, in the Annual Exchange of Information, should provide summary descriptions of activities conducted by persons subject to their jurisdiction, which should be in sufficient detail to allow evaluation of the effectiveness of 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.

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(MAPS)

Map 1. ASPA No. 153 Eastern Dallmann Bay: bathymetric map

