Management Plan

For Antarctic Specially Protected Area No. 136 CLARK PENINSULA, BUDD COAST, WILKES LAND, EAST ANTARCTICA

Introduction

Antarctic Specially Protected Area (ASPA) No. 136 is located on Clark Peninsula, Wilkes Land at 66°15'S, 110°36'E (see Map A).

The Clark Peninsula was originally designated as Site of Special Scientific Interest (SSSI) No. 17 under Recommendation XIII-8 (1985). A revised Management Plan for SSSI 17 was adopted under Measure 1 (2000). The area was redesignated and renumbered as ASPA 136 under Decision 1 (2002). Revised ASPA management plans were adopted under Measure 1 (2006), Measure 7 (2009) and Measure 5 (2014).

ASPA 136 is primarily designated to protect the Clark Peninsula's largely undisturbed terrestrial ecosystem. This ecosystem possesses one of the most extensive Antarctic flora communities outside of the Antarctic Peninsula and significant breeding populations of Adélie penguins (*Pygoscelis adeliae*) and south polar skuas (*Catharacta maccormicki*).

ASPA 136 is approximately 9.4 km^2 and is located approximately 5 km north-west of Casey station. Scientific research within the Area has focused on plant communities and long-term population studies of Adélie penguin colonies. The protection of this flora and fauna within the Area allows for valuable comparison with similar plant communities and penguin colonies closer to Casey station which are subject to greater levels of human disturbance.

1. Description of Values to be Protected

ASPA 136 is primarily designated to protect Clark Peninsula's largely undisturbed terrestrial ecosystem.

Clark Peninsula's ecosystem possesses one of the most extensive Antarctic flora communities outside of the Antarctic Peninsula. Its flora communities form a continuum of ecological variation along environmental gradients of soil moisture, soil chemistry and microclimate.

Clark Peninsula's ecosystem possesses intrinsic ecological value and scientific importance, particularly in the fields of botany, microbiology, soil science and glacial geomorphology. Ecosystem monitoring provides critical baseline data with which to analyse changes in Antarctic bryophyte, macrolichen and cryptogam communities. The cryptogam communities also support studies into short-term microclimate fluctuations and long-term climate change in the region since deglaciation some 5000-8000 years ago.

Stevenson's Cove within ASPA 136 contains the oldest individual moss plants that have been found in the Windmill Islands region indicating the importance of this site for protection of vegetation (Waterman, 2015). Dating of long cores of mosses using ^{14}C shows that these individual moss plants can be hundreds of years old and stable, carbon isotopes of moss shoots, which provide a signature for changes in site water availability show that moss beds have become drier since the 1960s. ASPA 136 mosses show less evidence of drying (29% of cores) than the regional mean (40% of cores) (Waterman, 2015, Robinson et al., 2018).

Clark Peninsula supports relatively undisturbed breeding populations of Adélie penguins (*Pygoscelis adeliae*) and south polar skuas (*Catharacta maccormicki*). The significant populations of Adélie penguins at Whitney Point and Blakeney Point have been studied since 1959. These studies provide valuable comparative data for measuring human impacts upon the Adélie penguin colonies located near Casey station, and as the time series has extended, have become increasingly important for understanding the response of seabirds to climate and ecosystem change. Breeding populations of Wilson's storm petrels (*Oceanites oceanicus*) and snow petrels (*Pagodroma nivea*) are present in most ice-free areas of ASPA 136.

Clark Peninsula possesses intrinsic geological value. It provides a visible time sequence of the emergence of the Windmill Islands from the sea since the Holocene deglaciation.

The Area requires protection because of its ecological importance, its significant scientific value and the limited geographical extent of the plant communities. The Area is vulnerable to disturbance from trampling, scientific sampling, pollution and alien introductions, while being sufficiently distant from Casey station to avoid immediate impacts and disturbances from activities undertaken there. It is because of the scientific and ecological values, and the usage of the Area for long term monitoring, that it should continue to be protected.

2. Aims and Objectives

Management of the Area aims to:

- avoid degradation of, or substantial risk to, the values of the Area by preventing unnecessary human disturbance to the Area;
- allow scientific research in the Area provided it is for compelling reasons which cannot be served elsewhere and which will not jeopardise the natural ecological system in the Area;
- preserve a part of the natural ecosystem as a reference for recovery from human impacts, including the indirect effects of Casey station;
- prevent or minimise the introduction to the Area of alien plants, animals and microbes; and
- minimise the possibility of the introduction of pathogens which may cause disease in fauna populations within the Area.

3. Management Activities

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

- a copy of this Management Plan made available at: Casey station, Wilkes Hilton refuge hut; and Jack's Donga refuge hut;
- signage installed at the Area boundary illustrating the location, boundaries and restrictions that apply to the Area to prevent inadvertent entry;
- markers, signs and structures erected within the Area for scientific or management purposes, and secured, maintained in good condition and removed when no longer required;
- abandoned equipment or materials removed to the maximum extent possible provided it does not adversely impact on the values of the Area;
- visitation of the Area as necessary (where practicable, no less than once every five years) to assess whether the Area continues to serve the purposes for which it is designated and to ensure that management activities are adequate; and
- review of the Management Plan at least every five years with updating as required.

4. Period of Designation

This Area is designated for an indefinite period.

5. Maps

- **Map A:** Antarctic Specially Protected Areas, Windmill Islands, East Antarctica
- **Map B:** Antarctic Specially Protected Area No. 136, Clark Peninsula, Windmill Islands, East Antarctica – Topography and distribution of birds
- **Map C:** Antarctic Specially Protected Area No. 136, Clark Peninsula, Windmill Islands, East Antarctica – Distribution of major vegetation types
- **Map D:** Antarctic Specially Protected Area No. 136, Clark Peninsula, Windmill Islands, East Antarctica – Geology
- Map specifications:
  - Projection: UTM Zone 49
  - Horizontal Datum: WGS84
- **Figure 1:** Population size and breeding success of Adélie penguins

6. Description of the Area

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

General description

Clark Peninsula (66°15'S 110°36'E) is located on the northern coastline of Newcomb Bay at the eastern end of Vincennes Bay on Budd Coast, Wilkes Land (see Map A). It is an area of permanent ice, snow fields and rocky exposures. It is approximately 3.5 km wide and 4.5 km long.

The Area itself covers an area of 9.4 km² and comprises all of the land on Clark Peninsula north of the southern boundary line connecting the east side of Powell Cove at 66°15'15" S 110°31'59" E, through 66°15'29"S 110°33'26"E, 66°15'21"S 110°34'00"E, 66°15'24"S 110°35'09"E, 66°15'37"S 110°34'40"E, 66°15'43"S 110°34'45"E to a point to the east-south-east on the Løken Moraines at 66°16'06"S 110°37'11"E. The eastern boundary is the westernmost limit of the Løken Moraines as far north as a point east of Blakeney Point at 66°14'15"S 110°38'46"E and thence to the coastline at 66°14'15"S 110°38'06"E, returning along the coast to the point of origin. The boundary of the Area is indicated on Maps A, B, C and D.

Environmental Domains Analysis

Clark Peninsula is located within Environment D *East Antarctic coastal geologic* (Resolution 3 (2008)).

Antarctic Conservation Biogeographic Regions

Clark Peninsula is located within Biogeographic Region 7 *East Antarctica* (Resolution 6 (2012)).

Important Bird Areas in Antarctica

Clark Peninsula represents *Important Bird Area* No. 147 (Resolution 5 (2015)).

Flora

Clark Peninsula's comparatively mild temperatures facilitated the development of a complex, diverse and stable vegetation cover. The ice-free rocky exposures support an extensive cover of lichen. Mosses predominate in lower lying areas. Factors responsible for the distribution of vegetation include wind exposure, the availability of water and the location of abandoned penguin colonies.

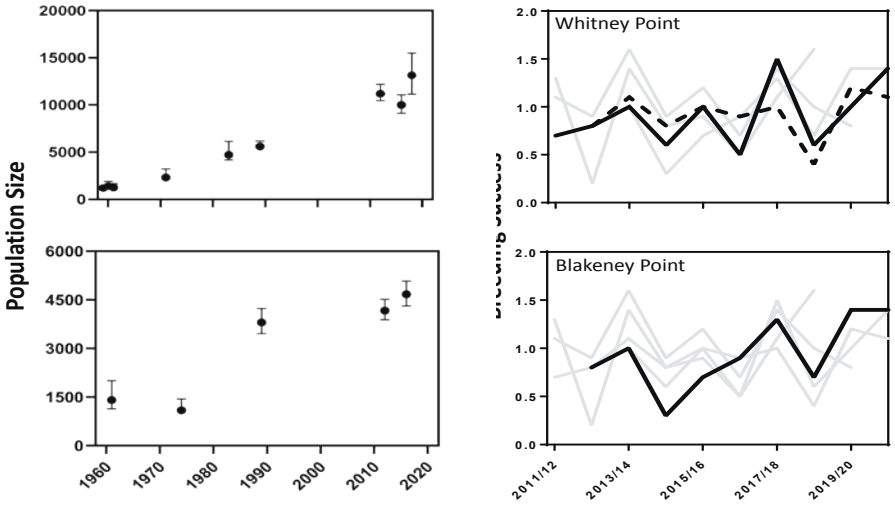
The broader Windmill Islands region possesses 4 species of bryophytes, 30 species of lichens, 44 species of cyanobacteria and 75 species of algae. Many of these taxa are known to inhabit Clark Peninsula. Well-developed macrolichen communities of *Umbilicaria decussata*, *Pseudephebe minuscula*, *Usnea sphacelata* communities predominate in the northeast. Further inland *U. sphacelata* predominates and forms extensive carpets over the metamorphic rocks and gravel beds.

Bryophyte communities of mosses *Bryum pseudotriquetrum*, *Schistidium antarctici* and *Ceratodon purpureus,* and liverwort *Cephaloziella varians* predominate in moist, sheltered sites where they form closed stands up to 15 cm in depth. The lichens *Xanthoria mawsonii*, *Candelariella flava* and *Buellia frigidida* predominate around the Adélie penguin colonies of the north-western and western coasts. *Usnea. decussata* and *U. sphacelata* predominate around the abandoned penguin colonies of the southern coastal areas, and *U. decussata*, *P. minuscula*, *B. soredians* and *B. frigid* predominate in the centre of Clark Peninsula alongside smaller assemblages of *Pleopsidium chlorophanum*. Clark Peninsula's microflora includes algae (with *Botrydiopsis constricta* and *Chlorella conglomerata* predominating), bacteria, yeasts and filamentous fungi. Flora distributions on the Clark Peninsula are depicted at Map C.

Fauna

Adélie penguin (Pygoscelis adeliae) colonies are located on Whitney Point and Blakeney Point. In 2012-13 Whitney Point supported approximately 11,000 occupied nests and Blakeney Point supported approximately 4000 occupied nests (Southwell et al., 2015). The breeding populations of these two sites have increased since research commenced in 1959-60, consistent with a six-fold increase over the last 6 decades of the entire Windmill Islands population (see Figure 1).

Figure 1: Population size and breeding success of Adélie penguins (data from Southwell et al., 2015 and 2021). Population size in terms of breeding pairs across time for Whitney and Blakeney Points, and for breeding success from automated cameras showing times series for each site in black noting there are two cameras established at Whitney Point, with grey lines indicating breeding success across other Windmill Islands sites (data from McLatchie et al., 2024). Note that breeding success occurs over split calendar years associated with the austral summer.



Recent surveys indicate that some sites within the broader Windmill Islands area may have slowed their rapid growth rate as a result of density-dependent limitations (Southwell et al., 2021). Breeding success from the nest camera monitoring system established at Whitney Point showed similar fluctuations across years as other sites in the Windmill Islands, although breeding success in 2014/15 and 2015/16 was depressed at Blakeney Point compared with other sites (Figure 1).

Adélie penguins forage farther from the Whitney Point colony than breeding colonies in the Davis and Mawson regions. They travel well beyond the shelf break during the incubation period and reach the shelf break during the chick rearing period (Emmerson et al., 2013). Their diet comprises largely of krill (>50%) followed by fish, calanoid copepods, jellyfish and amphipods (McInnes et al., 2015). Wilson's storm petrels (*Oceanites oceanicus*), sSouth pPolar skuas (*Catharacta maccormicki*) and sSnow petrels (*Pagodroma nivea*) continue to breed within the Area. Species distributions on the Clark Peninsula are depicted on Map B.

Terrestrial invertebrate microfauna includes protozoa, nematodes, mites, rotifers and tardigrades. The invertebrates are mainly confined to moss beds, lichen stands and moist soils.

Climate

The climate at the Clark Peninsula and the Windmill Islands is dry and frigid. Meteorological data collected at nearby Casey station indicates that the Clark Peninsula's mean temperature range is 0.3°C to -14.9°C. Temperature extremes of 9.2°C (24 January 2020) and -41°C have been recorded. Precipitation occurs as snow at approximately 195 mm rainfall equivalent annually. Approximately 96 days of gale-force winds are experienced annually. These are predominantly easterly in direction and emanate from the polar icecap. Snow gathers in the lee of rocky exposures and in substratum depressions.

Geology

Clark Peninsula possesses intrinsic geological value. It provides a visible time sequence of the emergence of the Windmill Islands from the coastal sea since the Holocene deglaciation. It is comprised of low lying, rounded, ice-free rocky outcrops. Its intervening valleys are filled with permanent snow, ice or glacial moraine and exfoliated debris. It rises eastward to the Løken Moraines where it reaches an approximate altitude of 130 metres above sea level.

Outcrops of metapelitic rock and leucocratic granite gneiss predominate. The metapelitic rock is generally foliated, migmatized and fine to medium grained. Mineralogy of the metapelitic rock includes biotite-sillimanite and biotite-sillimanite±cordierite. The sillimanite is strongly lineated in the foliation and the cordierite is generally pinnitized.

The early granite gneiss is white, medium grained and foliated. It comprises two felsic intermediate intrusions which predate and/or are synchronous with the deformation in the Windmill Islands. The larger intrusion, which occupies most of central Clark Peninsula, is a quartz, K-feldspar, biotite, white mica and opaque-bearing granitic augen gneiss. Small outcrops of mafics and metapsammite occur. The rock beds lie in a south-west to north-east orientation. The surface geology of Clark Peninsula is depicted at Map D.

Islands of the Windmill Islands group are located offshore from the Area. The Windmill Islands represent one of the easternmost outcrops of a Mesoproterozoic low-pressure ganulite facies terrain that extends westward to the Bunger Hills and the Archaean complexes in Princess Elizabeth Land and eastward to Dumont D'Urville and Commonwealth Bay. The rocks of the Windmill Islands group comprise a series of migmatitic metapelites and metapsammites interlayered with mafic to ultramafic and felsic sequences with rare calc-silicates, large partial melt bodies (Windmill Island supacrustals), undeformed granite, charnockite, gabbro, pegmatite, aplites and late dolerite dykes.

Gravels and soils appear to be derived from marine sediments deposited in the Pleistocene. Subfossil penguin colonies are common at Whitney Point and Blakeney Point and along the central ridge. Around the abandoned penguin colonies, the soils are pebbly and rich in organic matter derived from penguin guano. Small lakes, pools and melt streams are prevalent in summer. The distribution of lakes on Clark Peninsula is depicted at Map B.

6(ii) Access to the Area

The Area may be accessed from Casey station by over-snow vehicle or small boat in accordance with section 7(ii) of this Management Plan.

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

A dilapidated wood and canvas hide known as "the Wannigan" is located on the Lower Snow Slope (unofficial place name) on the western facing slope of Whitney Point. It was constructed in 1959 by R. L. Penney to facilitate behavioural studies of Adélie penguins.

The Area possesses several survey markers, and several boundary markers delineate the Area's southern boundary.

Four automated camera facilities are located within the Area. Their purpose is to monitor long term variations in the breeding parameters of Adélie penguins. They form part of an ongoing automated camera network across east Antarctica. They are located at Whitney Point (66°15'5.70"S 110°31'50.10"E and 66° 15' 3.20"S 110°32'2.60"E) and Blakeney Point (66° 14'32.20"S 110°34'53.20"E and 66° 14'24.23"S 110°34'32.06"E).

Several structures are also located adjacent to the Area. At its closest point, the Area's boundary is located approximately:

- 3.5 km northeast of Casey station (66°17' S 110°31' E);
- 1.0 km north of the former Wilkes station and 0.2 km north of Wilkes Hilton refuge hut (66°15'25.6"S 110°31'32.2"E);
- 1.5 km southwest of Jack's Donga refuge hut (66°13.7'S 110°39.2'E).

6(iv) Location of other Protected Areas in the vicinity

Other protected areas in the vicinity include (see Map A):

- ASPA No. 135, Northeast Bailey Peninsula (66°16'59.9"S, 110°31'59.9"E): located 2.5 km south-west of Clark Peninsula, across Newcomb Bay, adjacent to Australia's Casey station;
- ASPA No. 103, Ardery Island and Odbert Island (66°22'20"S, 110°29'10"E): located in Vincennes Bay, 13 km south of the former Wilkes station; and
- ASPA No. 160, Frazier Islands (66°13'S 110°11'E): located approximately 16 km to the north-west in Vincennes Bay.

6(v) Special zones within the Area

A Transit Zone is located north-east of a line that runs north-west from the ASPA boundary at 110°38'34"E, 66°14'47"S to 110°36'54"E, 66°14'31"S (see Map B). Over-snow vehicles may pass through the Transit Zone to undertake scientific or management activities at the edge of the sea ice. To prevent disturbance to vegetation and relic penguin colonies, over-snow vehicles must only travel on ice or snow-covered ground. Use of the Transit Zone may be subject to specific permit conditions.

7. Terms and Conditions for Entry Permits

7(i) General permit conditions

Entry to 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:

- the activities permitted give due consideration, via the environmental impact assessment process, to the continued protection of the values of the Area;
- the actions permitted are in accordance with this Management Plan and its objectives and provisions;
- permits shall be issued for a finite period;
- permits shall be carried when in the Area;
- permit holders shall notify the permitting authority of any activities or measures undertaken that were not authorised by the permit;
- a visit report must be supplied to the authority that approved the permit, as soon as practicable after the visit to the Area has been completed (but no later than six months after the visit has been completed); and
- all census and GPS data should be made available to the permitting authority and to the Party responsible for the development of the Management Plan.

Additional conditions, consistent with this Management Plan's objectives and provisions, may be included by the permitting authority, including (but not limited to) the following:

- maintenance of the communications installation and associated facilities, and removal of obsolete structures/materials.

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

The Area should only be accessed via:

- Wilkes Hilton refuge hut in the south-west;
- Jack's Donga refuge hut in the north-east; or
- a descent of the western slope of Løken Moraines in the vicinity east of Stevenson Cove following a traverse from Casey station to Jack's Donga refuge hut.

The abandoned Wilkes station may be accessed from Casey station via a cane marked route to the south of the Area's southern boundary. On approaching the Area from Casey station, in the areas east and north-east of Noonan Cove, a section of the route is split providing two alternative routes (see Map B). The more southerly route should be used when ice conditions near Noonan Cove allow for safe access. When access via the more southerly route is not possible, the more northerly route should be used. As the Casey–Wilkes route is very close to the Area boundary, pedestrian and vehicular traffic should take care not to stray northward into the Area.

Wilkes station may also be accessed via small boat from Casey station. A designated small boat landing site is located in Powell Cove at 110°31'29"E 66°15'22"S.

Access to the sea ice by over-snow vehicles is allowed within the Transit Zone that is located north-east of a line that runs north-west from the ASPA boundary at the Løken Moraines at 110°38'34"E 66°14"47"S to the coastline at 110°36'54"E 66°14'31"S. All vehicles must only travel on ice or snow-covered ground to avoid disturbance to vegetation and relic penguin colonies.

Vehicles must not access the remainder of the Area except in emergencies. Access to the Area in all other circumstances should be made on foot. Pedestrian traffic in the Area should be kept to the minimum necessary to achieve the objectives of permitted activities. To prevent damage to sensitive soils, plant and algae communities and water quality, visitors must avoid walking on visible vegetation and moist ground.

Helicopters are not allowed to land within the Area, except in emergencies or for essential management activities. The operation of aircraft over the Area should be carried out in accordance with the Resolution 2 (2004) *Guidelines for the Operation of Aircraft Near Concentrations of Birds in Antarctica*.

Pedestrians should also exercise extreme care when in the Area to avoid damaging sensitive vegetation. Due to their fragile and brittle structure, macrolichens (fructose and foliose) are especially sensitive to damage from trampling. Growth rates for continental Antarctic lichens are exceedingly slow, with most growing only a fraction of a mm per year. As a consequence, if damaged, lichens will take hundreds or even thousands of years to recover. Foot traffic should therefore be minimised and remain on solid snow/ice (where there is no risk of punching through) or on bare rock to minimise impact when accessing or transiting through ice-free areas. Rock with crustose lichen cover will likely be more tolerant of occasional foot traffic, where it is practicable and safe, although extreme care should always be exercised.

The operation of Remotely Piloted Aircraft Systems (RPAS) over the Area should be carried out, as a minimum requirement, in compliance with the 'Environmental Guidelines for Operation of Remotely Piloted Aircraft Systems (RPAS) in Antarctica (v 1.1) contained in Resolution 4 (2018).

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

Activities which may be conducted within the Area include:

- compelling scientific research which cannot be undertaken elsewhere;
- sampling, but this should be the minimum required for the approved research programs;
- essential management activities, including monitoring, erection of signs, removal of structures/materials, and visits to assess the effectiveness of the Management Plan and management activities; and
- essential operational activities in support of scientific research or management within or beyond the Area.

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

Permanent structures and installations are prohibited within the Area. Temporary structures and installations may only be established in the Area for compelling scientific or essential management reasons and for a pre-established period, as specified in a permit.

Any temporary structure or installation established in the Area must be:

- first cleaned of organisms, propagules (e.g. seeds, eggs) and non-sterile soil;
- made of materials that do not impact on the surrounding environment, and can withstand Antarctic conditions;
- installed, maintained, modified and removed in a manner that minimises disturbance (and does not cause more damage than benefit) to the values of the Area;
- clearly identified by country, name of the principal agency/investigator, date of installation and date of expected removal;
- reported to the permitting authority if left *in situ* (GPS coordinates of long-term monitoring makers should be lodged with the Antarctic Data Directory System through the appropriate national authority); and
- removed when they are no longer required, or before the expiry of the permit, whichever is earlier.

7(v) Location of field camps

Camping is prohibited within the Area. Field parties should camp at either the Wilkes Hilton refuge hut or at Jack's Donga refuge hut (see Map A).

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

The following restrictions apply:

- No living animals, plant material, microorganisms or non-sterile soils shall be deliberately introduced into the Area. Appropriate precautions, such as the thorough cleaning of footwear and equipment, must be taken to prevent accidental introduction.
- No poultry products, including dried food containing egg powder, are to be taken into the Area.
- Chemicals may be introduced for scientific or management purposes specified in a permit, and shall be removed from the Area at or before the conclusion of the permitted activity.
- Permanent or semi-permanent fuel depots are not allowed. Fuel must not to be stored in the Area unless it is required for essential purposes connected with the activity for which the permit has been granted. All such fuel must be stored in sealed and bunded containers removed from the Area at or before the conclusion of the permitted activity.
- Any materials or supplies introduced for a stated period shall be removed at or before the conclusion of the stated period, and shall be stored and handled so that the risk of dispersal into the environment is minimised.

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

The taking of, or harmful interference with, native flora and fauna is prohibited except in accordance with a permit. Where the taking of, or harmful interference with, animals is involved, this action should be conducted in accordance with the *SCAR Code of Conduct for the Use of Animals for Scientific Purposes in Antarctica* as a minimum standard.

Ornithological research should be limited to activities that, where practicable, are non-invasive and non-disruptive to the breeding birds present within the Area. Invasive and/or disruptive research activities shall only be authorised if they will have no effect or only a temporary and transient effect on the population.

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

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 authorised, may be removed unless the impact of the removal is likely to be greater than leaving the material *in situ*. If such material is found, the appropriate national authority must be notified. Where possible, photographic documentation should be obtained and included in the site visit report.

7(ix) Disposal of waste

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

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

Permits may be granted to enter the Area to carry out the following measures, provided they do not adversely impact on the values of the Area:

- the collection of samples for analysis or review;
- the establishment or maintenance of scientific and/or logistical equipment, infrastructure and signposts; and
- other protective measures.

7(xi) Requirements for reports

The principal permit holder for each permit issued shall submit to the permitting authority a report describing the activities undertaken no later than six months after the visit has been completed. Such reports should include, as appropriate, the information identified in the Visit Report form contained in the *Guide to the Preparation of Management Plans for Antarctic Specially Protected Areas*. 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 organising the scientific use of the Area.

8. Supporting Documentation

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Map A: Antarctic Specially Protected Areas, Windmill Islands, East Antarctica

Map available at: *https://data.aad.gov.au/aadc/mapcat/*
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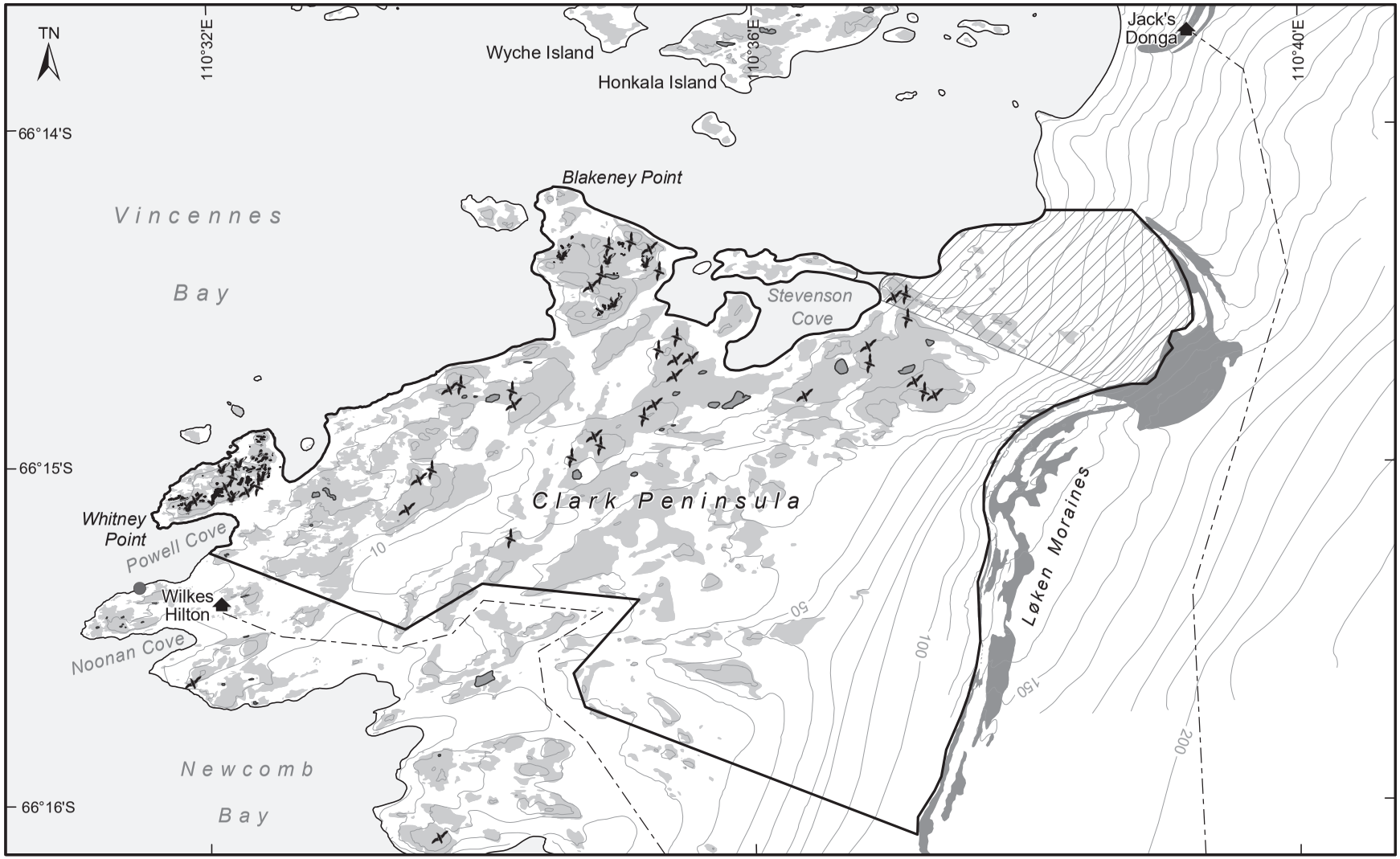
Australian Antarctic Division

Map B: Antarctic Specially Protected Area No. 136, Clark Peninsula

Topography and Bird Distribution



Refuge
Boat landing site
Over snow route
ASPA boundary
Transit zone

Adélie penguin colony

Nesting site
Snow petrel
South polar skua
Wilson's storm petrel

Contour (10m interval)
Coastline
Lake
Moraine
Ice-free area

0 500 1000 Metres

Horizontal Datum: WGS84
Projection: UTM Zone 49

Map available at: *https://data.aad.gov.au/aadc/mapcat/*
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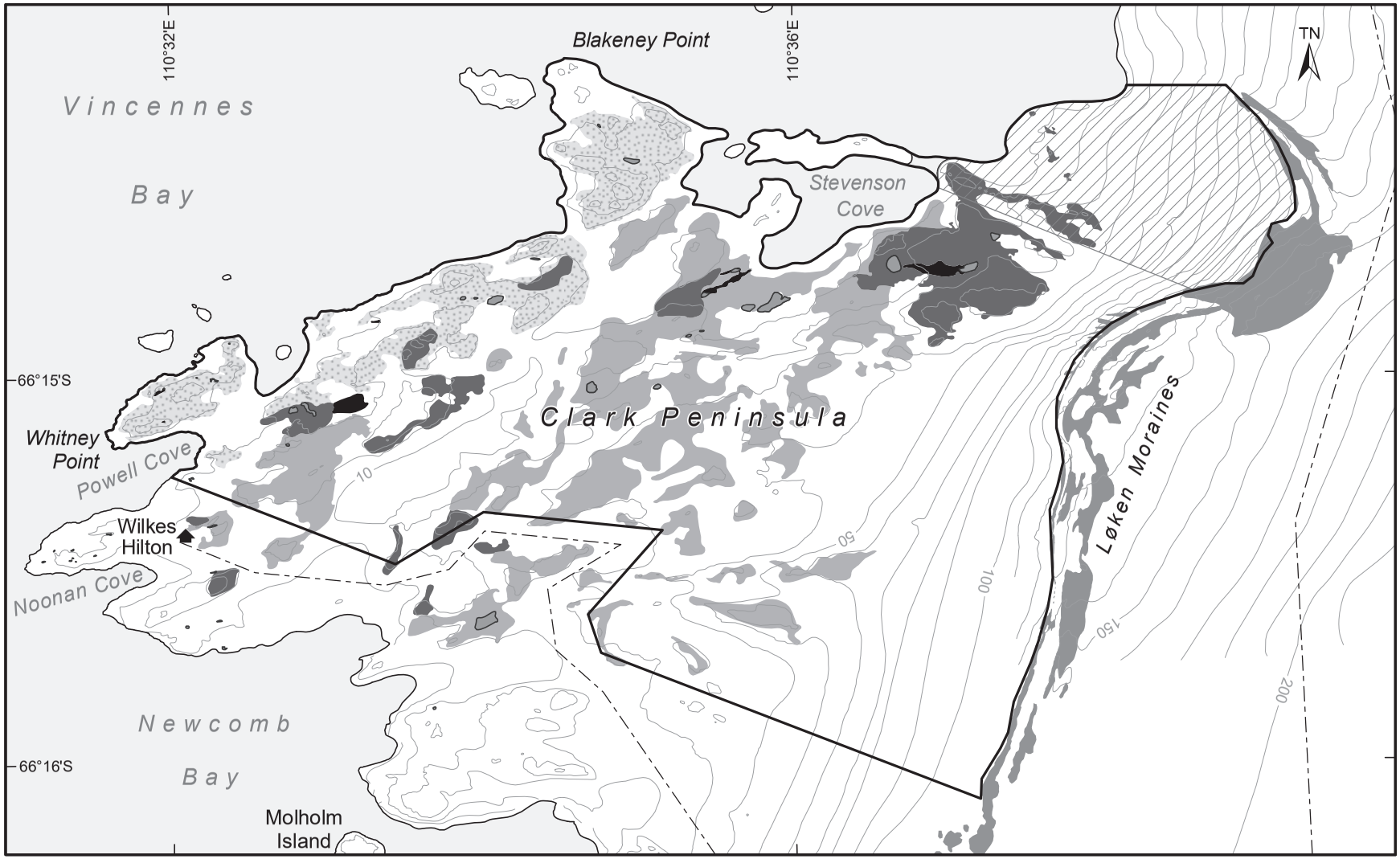
Map C: Antarctic Specially Protected Area No. 136, Clark Peninsula

Vegetation



Vegetation
- Bryophytes
- *Buellia frigida*
- *Umbilcaria decussata*
- *Usnea sphacelata*

- Refuge
- Over snow route
- ASPA boundary
- Transit zone

- Contour (10m interval)
- Coastline
- Lake
- Moraine

0 500 1000 Metres

Horizontal Datum: WGS84
Projection: UTM Zone 49

Map available at: *https://data.aad.gov.au/aadc/mapcat/*
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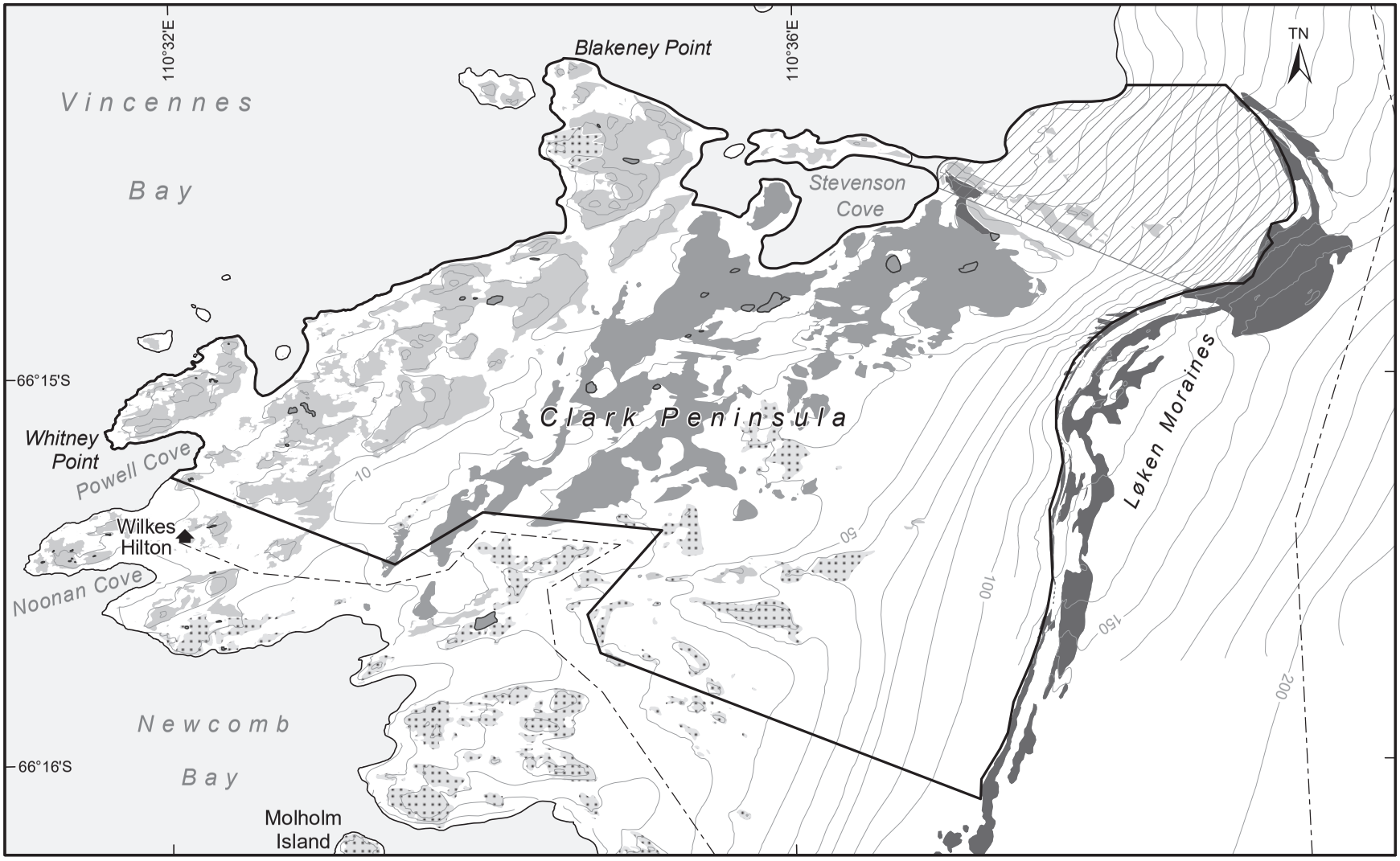
Map D: Antarctic Specially Protected Area No. 136, Clark Peninsula

Geology



Lithology
- Early granite gneiss
- Late granite gneiss
- Moraine
- Pelitic and psammitic gneiss

- Refuge
- Over snow route
- ASPA boundary
- Transit zone

- Contour (10m interval)
- Coastline
- Lake

0 500 1000 Metres

Horizontal Datum: WGS84
Projection: UTM Zone 49

Map available at: *https://data.aad.gov.au/aadc/mapcat/*
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