Management Plan

Antarctic Specially Protected Area No. 141
YUKIDORI VALLEY, LANGHOVDE, LÜTZOW-HOLM BAY

Introduction

The Yukidori Valley (69°14'30''S, 39°46'00''E) is located in the middle part of Langhovde on the east coast of Lützow-Holm Bay, continental Antarctica, which is about 20 km south of the Japanese Syowa Station (69°00'22''S, 39°35'24''E) on the Ongul Islands (Map 1). The Valley is 2.0-2.5 km long from east to west, 1.8 km wide and contains a prominent melt stream and two lakes (Map 2).

The Area was originally designated in Recommendation XIV-5 (1987, SSSI No.22) after the proposal by Japan. A management plan for the Area was adopted under Recommendation XVI-7 (1991) and revised under Measure 1 (2000).

Based on the Environmental Domains Analysis for Antarctica (Resolution 3 (2008)) the Area lies within Environment D – East Antarctic coastal geologic. In accordance with the Antarctic Conservation Biogeographic Regions (ACBR) (Resolution6 (2012)), the Area lies within ACBR 5

Enderby Land. The Yukidori valley is designated as ASPA to protect a fragile, typical continental Antarctic fellfield ecosystem and its component species, some of which are endemic to Antarctica, from the human activity in Antarctica. Additionally, long-term monitoring programs have been conducted in this valuable site.

1. Description of values to be protected

A fragile, typical continental fellfield ecosystem has developed in the Yukidori Valley. Field surveys of geological and biological sciences have been carried out in Langhovde since 1957 of the IGY period and a long-term monitoring program started in the Yukidori Valley area in 1984. More intensive studies have been carried out after the Area was designated as SSSI No.22 in 1987. Since 1984, the long-term monitoring program has continued in this Area, in particular to monitor temporal and spatial changes in vegetation of mosses and lichens (Map 2).

The values to be protected are those associated with this fragile, typical continental Antarctic fellfield ecosystem under quite harsh Antarctic environment, and the long-term scientific studies that have been carried out since 1984. Permanent quadrats for monitoring lichen and moss vegetation have been established in this typical continental ecosystem in relation to long-term environmental change.

The Area requires protection in order to ensure that this long-term scientific monitoring program is not compromised. Based on these reason, the Area was designated in Recommendation XIV-5 (1987, SSSI No.22) after the proposal by Japan, and the management plan for the Area was adopted under Recommendation XVI-7 (1991). The human activity in this area will easily destroy the fragile ecosystem under the harsh environment in continental Antarctica, and it will take so long period or absolutely impossible to recover. By designed as ASPA, this valuable fellfield ecosystem should be protected and the value for research on the ecosystem and environmental monitoring.

The Yukidori Valley is inhabited by several thousand snow petrels. Excrement of snow petrels is important as a major supply of nutrients for mosses and lichens.

By the continuous environmental monitoring study in the ASPA area, the effect of global environmental change in Antarctica will be detected and it will contribute as a sentinel system for the whole world.

2. Aims and objectives

Management at Yukidori Valley aims to:

- avoid degradation of, or substantial risk to, the values of the Area by preventing unnecessary human disturbance to the Area;
- allow a continuation of long-term monitoring programs;
- avoid major changes to the structure and composition of the terrestrial vegetation, in particular the moss and lichen banks;
- prevent unnecessary human disturbance to the snow petrels, as well as to the surrounding environment, and
- minimise the possibility of introduction of alien plants, animals and microbes into the Area, and
- Allow visits for management purposes in support of the aims of the Management Plan.

3. Management activities

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

- Maps showing the location of the Area (stating the special restrictions that apply) shall be displayed prominently at "Biological research hut" located outside of the western boundary of the Area, where copies of this management plan shall also be made available.
- Signs showing the location and boundaries of the Area and listing entry restrictions should be placed at the entry point at the western boundary of the Area to help avoid inadvertent entry.
- Markers, signs or structures erected within the Area for scientific or management purposes shall be secured and maintained in good condition and removed when no longer necessary.
- Information about the ASPA, including copies of the Management Plan, should be made available at all facilities operating in the region
- Personnel (national programme staff, field expeditions, tourists and pilots) in the vicinity of, accessing or flying over the Area shall be specifically instructed, by their national program (or appropriate national authority) as to the provisions and contents of the Management Plan.
- All pilots operating in the region shall be informed of the location, boundaries and restrictions applying to entry and over-flight in the Area.

4. Period of designation

Designated for an indefinite period.

5. Maps

Map 1: Sôya Coast, Lützow-Holm Bay, East Antarctica.

Map 2: Yukidori Valley, Langhovde and the boundary of ASPA No. 141.

Map 3: The biological research hut and surroundings.

6. Description of the Area

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

The Yukidori Valley (69°00'30''S, 39°46'00''E) is situated in the middle part of Langhovde, on the east coast of Lützow-Holm Bay, Continental Antarctica. The Area encompasses 2.0-2.5 km by 1.8 km, located between a tongue of the ice cap and sea at the western end of the Valley. The fellfield ecosystem and long-term monitoring sites are contained entirely within Yukidori Valley, and the Area boundary is designed to afford protection to the entire valley/ catchment system. The Area does not include any marine area.

The location of the Area and its boundaries are shown on the attached maps (Map 2). It is described as all the land within the Area bounded by the following lines:

The eastern boundary of the Area follows a straight line from 69°14'00''S, 39°48'00''E due south to 69°15'00''S, 39°48'00''E.

The northern boundary of the Area follows a straight line from 69°14'00''S, 39°48'00''E due west to the coastline at 69°14'00''S, 39°44'20''E (Map 2-A).

The southern boundary of the Area follows a straight line from 69°15'00''S, 39°48'00''E due west to the stream of Yatude Valley at 69°15'00''S, 39°45'20''E (Map 2-E).

The western boundary of the Area between 69°14'00''S, 39°44'20''E (Map 2-A) and 69°15'00''S, 39°45'20''E (Map 2-E), is delineated by the high-water line of the coast, rope boundaries and stream of Yatude Valley.

Map 2-A (69°14'00"S, 39°44'.20"E) to Map 2-B (69°14'31"S, 39°42'57"E): High-water line of the coast

Map 2-B (69°14'31"S, 39°42'57"E) to Map 2-C (69°14'38"S, 39°43'22"E): Rope boundaries

Map 2-C (69°14'38"S, 39°43'22"E) to Map 2-D (69°14'32"S, 39°43.01"E): Rope boundaries

Map 2-D (69°14'32"S, 39°43.01"E) to Map 2-E (69°15'00''S, 39°45'20''E): Stream of Yatude Valley

Geology

The Yukidori Valley contains a prominent melt stream and two lakes. The stream flows from the ice cap towards the sea through V-shaped and U-shaped sectors of the Valley and enters Lake Yukidori, in the middle of the Valley, 125 m above sea level; it then flows from the south-west corner of the lake and runs through the lower valley formed by steep cliffs. Sorted stone circles with mean diameter of 1 m are situated on moraines near the northwestern part of Langhovde Glacier to the east of Lake Higasi-Yukidori, which is located at the head of the Valley, about 200 m above sea level abutting the edge of the ice cap. Poorly-developed stone circles are found on fluvioglacial deposits in the Yukidori Valley. Small talus aprons and talus cones are located around Lake Yukidori. In the lower reaches of the Yukidori Valley, at on altitude of about 20 m, fluvioglacial terraces 20 to 30 m wide stand 2 to 3 m high above the present channel bed. These flat terraces consist of rather fine sand and gravel. There is a dissected deltaic fan formed at the mouth of the stream. The Valley is underlain by well-layered sequences of late Proterozoic metamorphic rocks, consisting of garnet-biotite gneiss, biotite gneiss, pyroxene gneiss and hornblende gneiss with metabasite. The foliation of the gneisses strike N10°E and dips monoclinally to the east (Map 3).

Flora and fauna

Almost all of the plant species recorded from the Langhovde area occur within the Area. They include the mosses Bryum pseudotriquetrum (= Bryum algens), Bryum argenteum, Bryum amblyodon, Ceratodon purpureus, Hennediella heimii, Pottia austrogeorgica, Grimmia lawiana and lichens Usnea sphacelata, Umbilicaria antarctica, Umbilicaria decussata, Pseudephebe minuscula, and Xanthoria elegans. Four species of free living mites (Nanorchestes antarcticus, Protereunetes minutus, Antarcticola meyeri, Tydeus erebus), have been reported. There are over sixty species of microalgae, including species endemic to the Yukidori Valley, Cosmarium yukidoriense and a variety of Cosmarium clepsydra. Such vegetation is distributed all along the stream. Several pairs of the south polar skua (Catharacta maccormicki) and several thousand snow petrels (Pagodroma nivea; note "Yukidori" is Japanese for the snow petrel) breed at the cliff along the valley.

6(ii) Access to the area

Access to the Area is covered under section 7(ii) of this plan

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

The biological research hut is located just outside the western boundary of the Area at (69°14'36"S, 39°42'59"E).The boundary of the Area near the hut is enclosed by ropes. It was constructed in 1986 near the beach at the mouth of the Valley so that there would be minimal impact on the flora, fauna, and terrain of the Area. There are three sites for microclimatic observations in the lower, middle and upper reaches of the stream within the Area. Microclimatic factors such as relative humidity and air temperatures at ground level, soil temperatures and temperatures at moss level are measured. Hexagon chambers made of acrylic fiber are installed at the vegetated area in the lower and middle reaches in order to assess vegetational and environmental changes. These sites are indicated in the attached maps.

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

None.

6(v) Special zones within the Area

There are no special zones within the Area.

7. Terms and conditions for entry permits

7(i) General permit conditions

Entry 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 for compelling scientific or educational reasons that cannot be served elsewhere, or for essential management purposes consistent with plan objectives such as inspection, maintenance or review;
- the actions permitted will not jeopardize the ecological or scientific values of the Area;
- any management activities are in support of the aims and objectives of the management plan;
- the actions permitted are in accordance with this 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;
- Permit shall be issued for a stated period.
- The appropriate authority should be notified of any activities/measures undertaken that weren't included in the authorized Permit.

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

- The area is situated about 20 km south from Syowa station. In winter, snow vehicle access route is settled on the frozen sea ice. In summer, helicopter is used to access from Syowa station and ice-breaker.
- Access route of snow vehicle and helicopter are shown in Map3. Heliport is located outside of the boundary at 69°14'37''S, 39°42'53''E .
- Vehicles are prohibited within the Area and helicopter should not land within the Area.
- Only those pedestrians with compelling research activities are allowed to enter at the entry point (Map 2-C).
- No pedestrian routes are designated within the Area, but persons on foot should at all times avoid walking on vegetated areas or disturbance to birds and natural features.
- The operation of aircraft over the Area should be carried out, as a minimum requirement, in compliance with the 'Guidelines for the Operation of Aircraft near Concentrations of Birds' contained in Resolution 2 (2004).
- Overflight of bird colonies within the Area by RPAS shall not be permitted unless for scientific or operational purposes, and in accordance with a permit issued by an appropriate national authority.

7(iii) Activities which may be conducted in the Area, including restrictions on time or place

- Compelling scientific research which cannot be undertaken elsewhere and which will not jeopardize the ecosystem of the Area
- Essential management activities, including monitoring;

7(iv) Installation, modification or removal of structures

- No structures are to be erected in the Area, or scientific equipment installed, except for essential scientific or management activities, as specified in the Permit.
- All markers, structures or scientific equipment installed in the Area must be clearly identified by country, name of the principal investigator or agency, year of installation and date of expected removal.
- All such items should be free of organisms, propagules (e.g. seeds, eggs) and non-sterile soil, and be made of materials that can withstand the environmental conditions and pose minimal risk of contamination of the Area.
- Installation (including site selection), maintenance, modification or removal of structures and equipment shall be undertaken in a manner that minimises disturbance to the values of the Area
- Structures and installations must be removed when they are no longer required, or on the expiry of the permit, whichever is the earlier.

7(v) Location of field camps

Camping is prohibited within the Area. All the visitors stay in the biology research hut (69°14'36"S, 39°42'59"E) just outside the western boundary of the Area, or tent settled around the hut.

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

No living animals, plant material, microorganisms or soils shall be deliberately introduced into the Area and the precautions listed in 7(x) below shall be taken to prevent accidental introductions. Further guidance can be found in the CEP Non-native species manual (CEP,2017) and the Environmental code of conduct for terrestrial scientific field research in Antarctica(SCAR, 2009)In view of the presence of breeding bird colonies in the Area, no poultry products, including products containing uncooked dried eggs, shall be taken into the Area.

No herbicides or pesticides shall be brought into the Area. Any other chemicals, including radionuclides or stable isotopes, which may be introduced for scientific or management purposes specified in the Permit, shall be removed from the Area at or before the conclusion of the activity for which the Permit was granted. Fuel is not to be stored in the Area, unless specifically authorized by Permit for specific scientific or management purposes. Anything introduced shall be for a stated period only, shall be removed 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 is encouraged only where the impact of removal is not likely to be greater than that of leaving the material in situ. The appropriate authority should be notified of anything released and not removed that was not included in the authorized Permit.

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

Taking or harmful interference with native flora and 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(viii) The collection or removal of materials 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 in instances where it is proposed to take, remove or damage such quantities of soil, native flora or fauna that their distribution or abundance in 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(ix) Disposal of waste

Liquid human wastes may be disposed of into the sea adjacent to the area. All other wastes should be removed from the Area. Solid human waste should not be disposed of to the sea, but shall be removed from the Area. No solid or liquid human waste shall be disposed of inland.

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 biological monitoring and area inspection activities, which may involve the collection of a small number of samples or data for analysis or review.
- Any specific sites of long-term monitoring shall be appropriately marked on site and on maps of the Area. To help maintain the ecological and scientific values of the Area, visitors shall take special precautions against introductions. Of particular concern are microbial, animal or vegetation introductions sourced from soils, from other Antarctic sites, including stations, or from regions outside Antarctica. To the maximum extent practicable, visitors should ensure that footwear, clothing and any equipment particularly camping and sampling equipment- is thoroughly cleaned before entering the Area.
- To avoid interference with long-term research and monitoring activities or duplication of effort, persons planning new projects within the Area should consult with established programs and/or appropriate national authorities.

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, and 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 organizing the scientific use of the Area.

8. Supporting documentation

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