

Management Plan for Site of Special Scientific Interest No. 22

YUKIDORI VALLEY, LANGHOVDE, LÜTZOW-HOLM BAY

1. Description of values to be protected

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). A typical continental fellfield ecosystem has developed in this 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. Permanent quadrats for monitoring lichen and moss vegetation have been established in this typical continental ecosystem in relation to long-term environmental change. Therefore, the Area requires protection in order that this long-term scientific monitoring program not be compromised.

The Area was originally designated in Recommendation XIV-5 (1987, SSSI No.22) after a proposal by Japan on the grounds that it contains a typical continental Antarctic fellfield ecosystem. Yukidori Valley is inhabited by several thousand snow petrels and the excrement of snow petrels is important as a major supply of nutrients for mosses and lichens.

These are still valid reasons for maintaining protection. Since 1984, the long-term monitoring program has continued in this Area, in particular to monitor temporal and spatial change in vegetation of mosses and lichens (Map 2).

The values to be protected are those associated with this typical continental Antarctic fellfield ecosystem and the long-term scientific studies that have been carried out since 1984. The Area contains fluvioglacial terraces in the lower part of the Valley and a dissected deltaic fan at the mouth of the stream.

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.

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.

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 the Site of Special Scientific Interest (SSSI No. 22).

Map 3: Simplified geological sketch map of Yukidori Valley.

Map 4: The biological research hut and surroundings.

6. Description of the Area

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

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 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 coordinates:

69°14'00"S, 39°44'20"E

69°14'00"S, 39°48'00"E

69°15'00"S, 39°48'00"E

69°15'00"S, 39°45'20"E

The boundary from the point 69°14'00"S, 39°44'20"E to the point 69°15'00"S, 39°45'20"E includes a part of Yatude Valley, the coast line and is delineated with ropes. 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 fluvio-glacial 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 an altitude of about 20 m, fluvio-glacial 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 monoclinaly to the east (Map 3).

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 Yukidori Valley, *Cosmarium yukidoriense* and a variety of *Cosmarium clepsydra*. 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 in the Area. The Area does not include any marine area.

6(ii) Restricted and managed zones within the Area

None.

6(iii) Structures within and near the Area

The boundary of the Area near the hut is enclosed by ropes. The biological research hut 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. The location of hut is excluded from the Area. There are three sites for microclimatic observations in the lower, middle and upper reaches of the stream within the Area. In addition, a meteorological station is located near the hut, outside 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 within close proximity of the Area

None.

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 to enter the Area are that:

- it is issued only for compelling scientific 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(i) Access to and movement within the Area

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 4). 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.

7(ii) Activities that are or 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(iii) Installation, modification or removal of structures

No further structures are to be erected in the Area, or scientific equipment installed, except for essential scientific or management activities, as specified in the Permit.

7(iv) Location of field camps

Camping should be avoided within the Area.

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

No living animals, plant material or microorganisms shall be deliberately introduced into the Area and the precautions listed in 7(ix) below shall be taken to prevent accidental introductions. 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 radio-nuclides 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(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 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(viii) Disposal of waste

All wastes, including all human wastes, shall be removed from the Area. Human wastes may be disposed of into the sea.

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

- Permits may be granted to enter the Area to carry out biological monitoring and site inspection activities, which may involve the small-scale collection of samples for analysis or review, or for protective measures.
- Any specific long-term monitoring sites shall be appropriately marked.
- To help maintain the ecological and scientific values of Yukidori Valley special precautions shall be taken against introductions. Of concern are microbial, invertebrate or plant introductions from other Antarctic sites, including stations, or from regions outside Antarctica. All sampling equipment or markers brought into the Area shall be cleaned or sterilized. To the maximum extent practicable, footwear and other equipment used or brought into the Area (including backpacks, carry-bags and tents) shall be thoroughly cleaned before entering the Area.

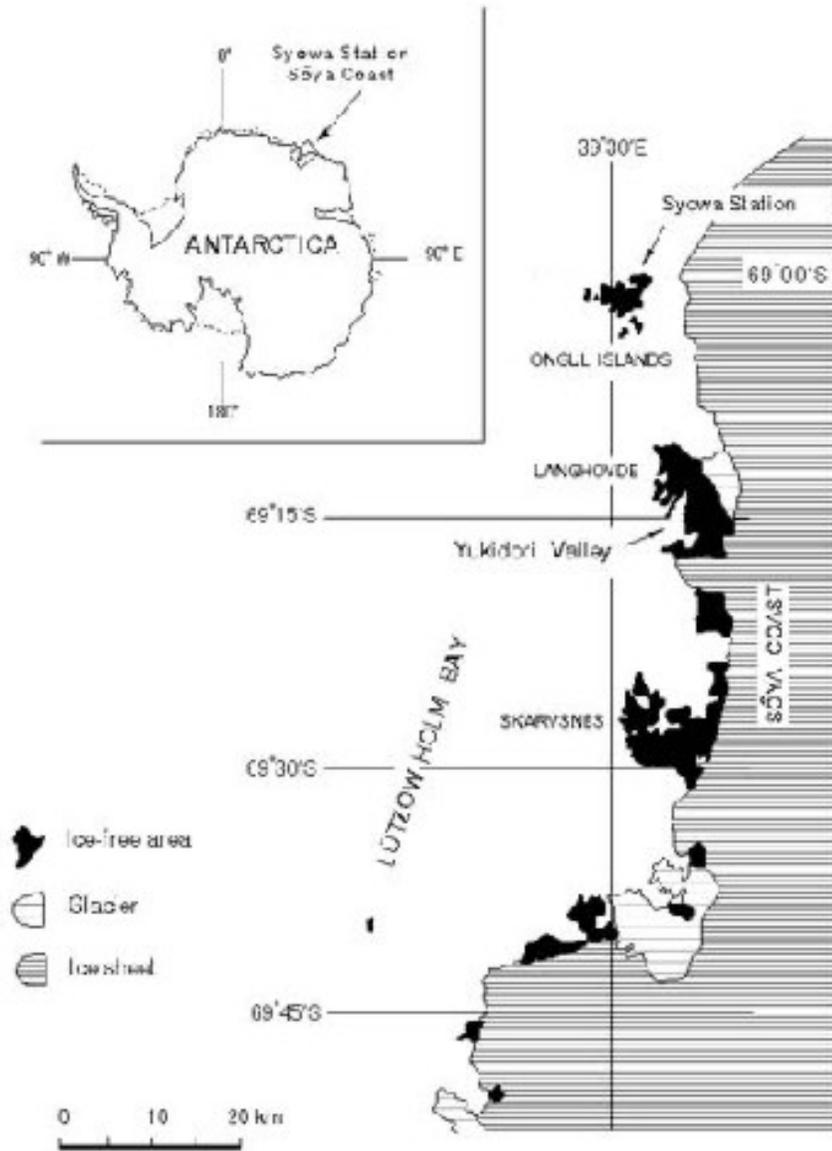
7 (x) Requirements for reports

Parties should ensure that the principal holder for each Permit issued submits to the 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.

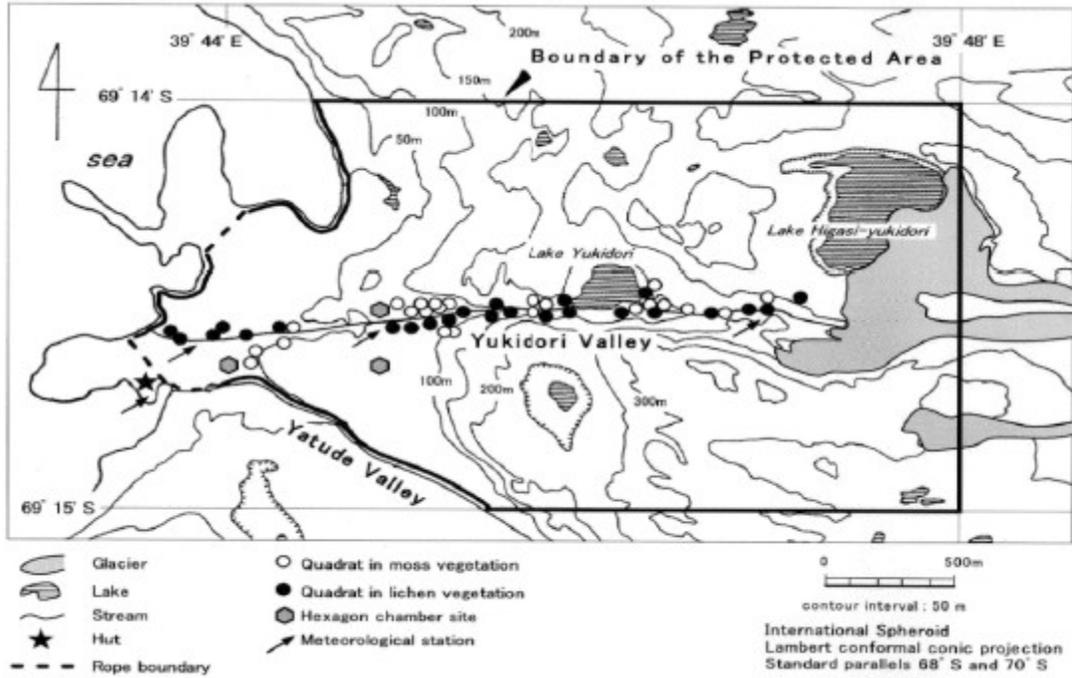
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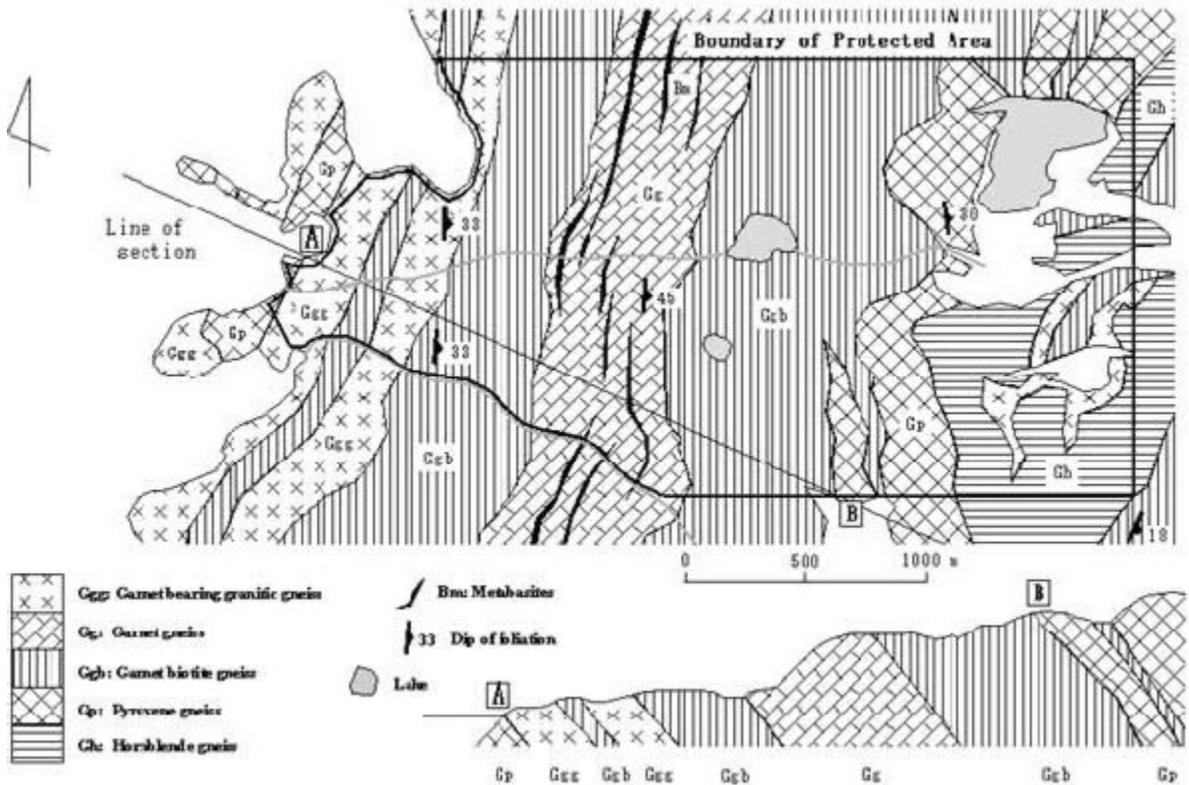
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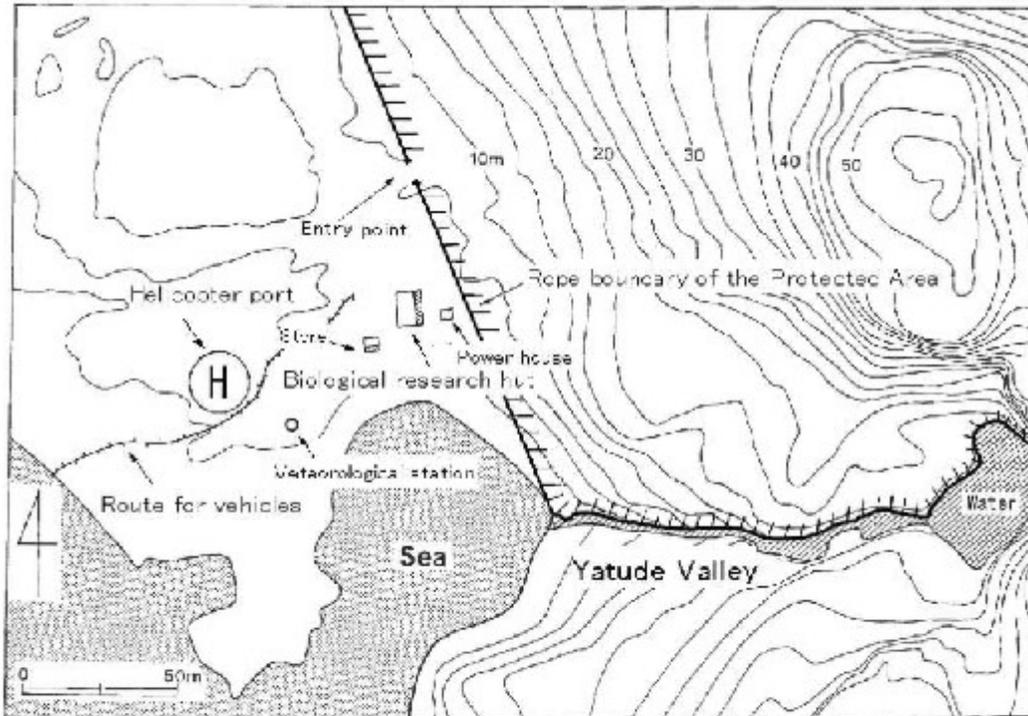
Map 1: The map of Sôya Coast, Lützow-Holm Bay, East Antarctica.



Map 2 : Yukidori Valley, Langhovde and the boundary of the Protected Area



Map 3: Simplified geological sketch map of Yukidori Valley



Map 4 : The biological research hut and surroundings.