

**Antarctic Science Bursary Report**  
**Community development in an extreme environment.**  
**Byers Peninsula 7-21 January 2009.**

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The Antarctic Science Foundation bursary enabled me to conduct field work at sites on the Byers Peninsula, Livingston Island in the South Shetland Islands (Fig. 1). This fieldwork was also supported by the Spanish International Polar Year research programme. My thanks go to Professor A Quesada, Univ Autonoma de Madrid and the Spanish national Antarctic operator for logistic support.

**Aims of the fieldwork.**

The research aimed to quantify ecological processes of early community development in a newly discovered, relatively simple, ecosystem, by measuring colonisation and succession in areas of the intertidal zone, of increasing duration since permanent ice cover. The research was undertaken at sites selected on the basis of length of time since loss of permanent ice cover, under advice from the British Antarctic Survey's Mapping and Geographic Information Centre (MAGIC).

**Summary of activity:**

Three sites were sampled close to the Rotch Glacier (Fig.2. inset). The sites had been ice free for c.50 years (site 1), 20 years (site 2) and less than 10 years (site 3). In addition to these sites, three additional sites were sampled, giving a good overview of intertidal habitats on the Byers Peninsula.

Site 4 (adjacent to the camp) was studied to determine whether the Antarctic intertidal zone can exhibit patterns of littoral zonation similar to those on temperate rocky shores. A transect of stations from low water to the high water mark was sampled. Two further sites at Sealers Point (site 5) and Cape Smellie (site 6) were also investigated (Fig. 2).

A total of 36 replicate samples from both rocky and sedimentary habitats were taken and the taxa found collected and preserved for identification. In addition to this, 20 samples of terrestrial habitats were analysed and the invertebrates collected and preserved.

**Preliminary results:**

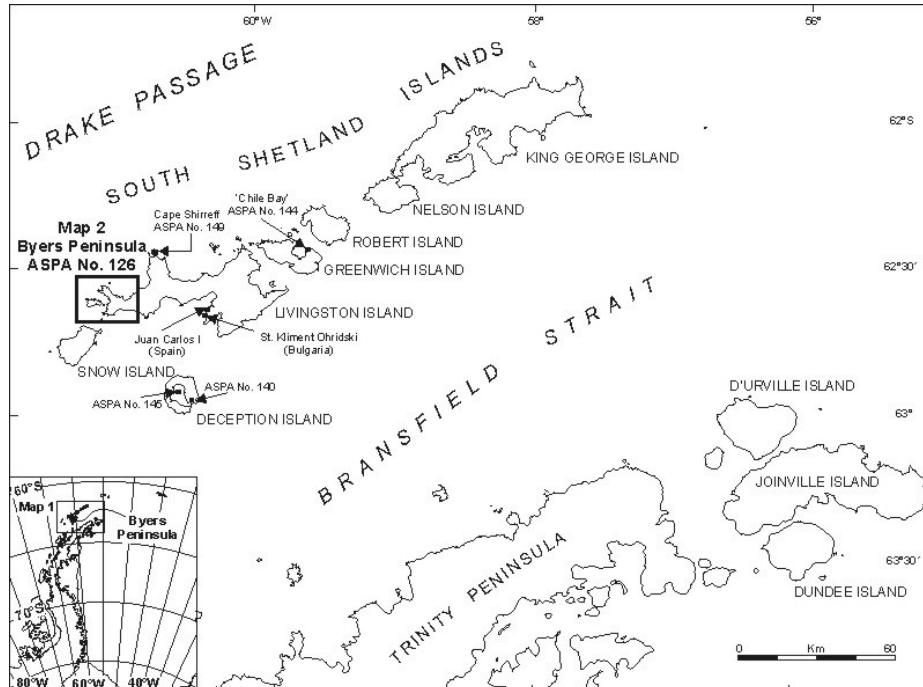
It is estimated that at least 30 faunal species from nine phyla and 15 classes and were found in the intertidal zone (plate 1). Algal cover was high with 95% cover at several sites. Algal species richness was also high for Antarctic intertidal sites with a minimum of 10 species being present at site 4. There is also some evidence to suggest that patterns of zonation found in temperate rocky shore habitats may also occur at sites in the Antarctic (plate 2).

**Summary:**

The results will represent a substantial addition to our knowledge of Antarctic intertidal systems, with several groups of taxa being reported for the first time. The presence of large areas of algal cover raises interesting questions as to the severity of disturbance at these sites, and brings into question the general perception that the Antarctic intertidal zone is too extreme to support anything

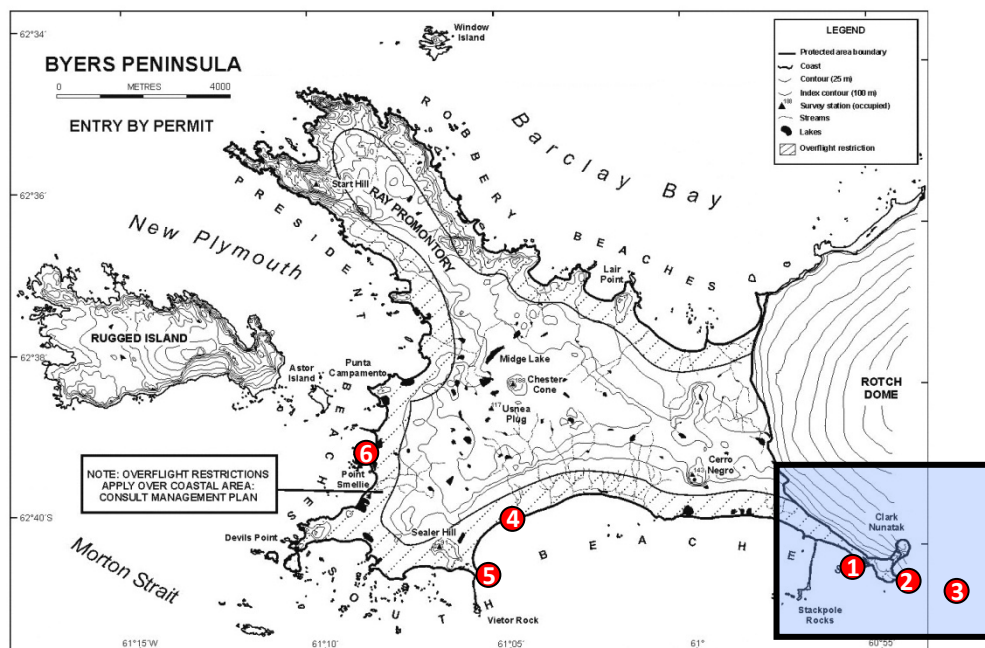
more than transient populations of opportunistic species. This view is also challenged by the presence of areas showing evidence of zonation of taxa.

**Fig. 1.** Location of Byers Peninsula .



**Map 1.** Byers Peninsula, ASPA No. 126, Livingston Island, South Shetland Islands, location map. Inset: location of Byers Peninsula on the Antarctic Peninsula

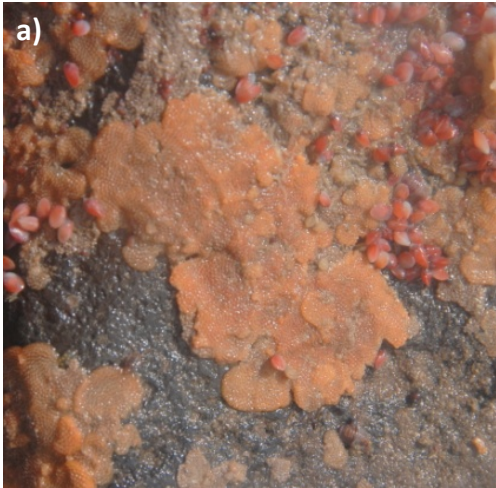
**Fig. 2.** Sites sampled on Byers Peninsula (red circles): The sites around Clark Nunatak (inset) were the target sites for investigating colonisation after glacial retreat.



**Map 2.** Byers Peninsula, ASPA No. 126, topographic map.

(Figs. 1 & 2 from: <http://www.scar.org/publications/bulletins/150/asp126/>)

**Plate 1. a, b.** Taxa found on underside of rocks at site 6.



**Plate.2.** Zonation of intertidal habitat



Plates 3 . Base camp.

