

CONSERVATION CHALLENGES IN THE SOUTH SHETLAND ISLANDS, ANTARCTICA

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ABSTRACT

The fur seal population of the South Shetland Islands, Antarctica, was intensively hunted by sealers from the discovery of the islands in 1819 through the early years of the 1820s, by which time the seal numbers were so depleted that sealing became uneconomic. Sealing was revived for both fur seals and Elephant seals at several periods later in the century. Sealers were put ashore in gangs and built makeshift shelters in which to live, and also occupied caves. Many of these have been identified on the various islands of the South Shetlands, and a number have been excavated. The paper addresses some of the management issues facing the conservation of these sites, which include accelerating tourism, disturbance by scientific researchers, animal activity, and drifting sand. The field work for this paper was undertaken with Dr Ruben Stehberg, Carolina Gatica and Omar Torres (Chile), and Dr Andres Zarankin (Argentina).

HISTORICAL BACKGROUND

The South Shetland Islands, lying off the Antarctic Peninsula some 900 km south of Cape Horn, were the site of the first known human habitation and exploitation of Antarctica.

The first confirmed sighting of the South Shetland Islands (originally named the 'New South Shetlands') was made by William Smith on 19 February 1819 while on a passage from Buenos Aires to Valparaiso in the brig *Williams* (Campbell, 2000: 69-7). Their discovery opened the way for the exploitation of the fur seals that bred there for their skins, bringing the Antarctic into the fur sealing trade which by that date was already global in scale (see Busch, 1985; Headland, 1984; Richards, 1982; Cumpston, 1968; Kerr, 1976). News of Smith's discovery was soon the subject of speculation in the ports of Valparaiso and Buenos Aires, and quickly reached New England and British ports. Even before Smith's discovery was officially confirmed, sealing captains based in Buenos Aires were in search of the new islands. (see Pearson 2006 for a more detailed background to sealing in the South Shetlands)

Calculating the number of ships visiting the South Shetlands in subsequent years is difficult, as various figures are used by various original participants and by later authors. The figures used here have been drawn from records collated from a number of sources (Bertrand 1971; Fildes 1821; Headland 1989; Jones 1985; Stackpole 1953 & 1955; Morrell 1832; Roberts 1958; Hattersley-Smith 1991).

While three ships are known to have sealed the islands in the 1819-1820 season, the 1820-21 season was the most productive in the short life of the South Shetlands as a fur sealing ground, with at least 69 vessels operating in the archipelago. The great majority of the ships were from either New England ports or from Britain. The

impact of the first two seasons on the fur seal population was devastating. When James Weddell went sealing in the South Shetlands in the 1822-23 season, he observed that the fur seals were becoming shy of man, and were occupying more distant rocks instead of the beaches. While still abundant, Weddell noted the decline in fur seal numbers, and advocated restrictions on the taking of mothers with pups in order to make the industry sustainable (Weddell, 1827: 140-142).

In the next season, 1821-22, at least 48 vessels operated in the South Shetlands, but the damage to the seal population had already been done, and some ships abandoned the islands with very few skins. In the 1822-23 season the number of recorded ships in the South Shetlands dropped to 12, and in the four subsequent seasons didn't exceed five ships. The attractiveness of the South Shetlands as a sealing ground was past. By 1829 James Eights observed of the fur seal that: 'This beautiful little animal was once most numerous here, but was almost exterminated by the sealers, at the time these islands were first discovered' (Eights, 1838: 209).

There is no accurate figure for the total number of seal skins taken during the height of the sealing boom at the South Shetland Islands. Working with figures reported for individual ships, the take in 1819-21 was at least 220,000 skins, together with at least 60,000 (from documented takes) in 1821-22, and 20,000 documented skins for 1822-27, so the catch for 1819-27 was at minimum 300,000 skins. That figure is based on the records for 50 ship-seasons, giving an average of 6,000 skins taken per ship each season. If this rate is applied to the 144 documented voyages in this period, a figure of 800,000 and 900,000 skins seems to be a reasonable estimate of the total catch (see Pearson 2006 for further analysis). The documentation of these voyages is generally limited to a basic record of ship movements into and out of ports. Only about a dozen journals are known to survive describing sealing activities in any detail, most of them in manuscript form in US and British libraries. Hence the archaeological record adds significantly to the information base about the nineteenth century sealing activities.

THE ARCHAEOLOGICAL RESOURCE

Because of the rugged coasts and wild seas of the South Shetlands, sealing crews were dropped ashore by boat and left for periods ranging from days to months, and on several occasions, by mischance, for over a year. Once ashore the men built shelters in caves, against cliff faces, or on open beaches, using dry-stone walls roofed with timber brought ashore or whale ribs from skeletons scattered on the beaches, and covered with tarpaulins or seal skins. This method limited the size of the huts to the available roofing materials, usually being 3 m wide or less, and in a few rare examples up to 5 m long. In some sites there are multiple structures, presumably to house larger crews and their gear.

Over 50 sealing sites have been identified by Chilean, British and Argentine researchers over the past 50 years, and several sealer structures have been excavated, and a program of systematic survey of the islands continues (see Pearson 2006; Stehberg 2003; Zarankin & Senatore 2005). Surviving sites include occupied caves that were completely undisturbed from the 1820s until surveyed and excavated. One located by the author and Chilean colleagues (Dr Ruben Stehberg, Carolina Gatica and Omar Torres) in 2005 had timber artefacts and seal-skin moccasins lying on the surface, and bottles scattered around the fireplaces. Others have stone walls

constructed across the back of the cave to provide more shelter for the occupants. The stone-walled structures against cliff faces and on open beaches are similarly largely undisturbed (but see below), the cultural deposits and collapsed roofs being buried in wind-blown sand. Occasionally large objects are also found embedded in the sand, such as a large wooden sledge excavated in 2007 (Pearson et al 2007). The largely undisturbed nature of the sites reflects the isolation of the sites and the very low human visitation after the sealing era.

THREATS AND CHALLENGES TO THE CONSERVATION OF THE SITES

There are a number of threats and challenges in the study and conservation of the sealing sites in the South Shetlands.

Accelerating tourism

While the South Shetland Islands and the adjacent Antarctic Peninsula experiences about 98% of the over 30,000 tourist visits per year to the Antarctic, visitation is limited to a very few sites that are more safely approached by ships and able to be landed on. The vast majority of beaches containing sealing sites have never been visited by tourists.

Tourism is very carefully managed and monitored, and it seems likely that limits will be placed, through the mechanisms of the Antarctic Treaty Organisation (ATO), on overall number of both ships and tourists within as few years if numbers keep increasing at the dramatic rate they have over the last decade (from about 10,000 in 1997-98 to 30,000 in 2006-07, and more than doubling since 2002-03 (IAATO figures, see: www.iaato.org/tourism_stats.html)).

The presence of sealing era remains is known on several sites visited by tourists, and indications are that these remains are not being impacted by tourist activities, but a comprehensive survey or monitoring program has not yet been carried out on all tourist sites. A risk is that with increasing tourist pressure further landing places will be targeted for visitation, and, as the sealing sites are often difficult to identify and almost always within 200 m of the shore, there is the possibility that sites and artefacts will be inadvertently damaged or destroyed. Accelerated archaeological survey and provision of information and management guidelines to tourism operators is required to limit this threat.

Disturbance by scientific researchers

By far the most intensive and extensive human presence in the South Shetlands is the scientific parties undertaking research and monitoring throughout the archipelago. Because the archipelago and adjacent Peninsula is the most accessible Antarctic region, it experiences the highest proportion of seasonal occupation by scientific parties. This is most intensive around the 16 permanent stations, occupied by 13 countries, many all-year round, but occupation can extend during the summer to every island in the group. While many of the areas with most known sealing sites are protected as Antarctic Special Protected Areas (ASPAs) (such as the Byers Peninsula and Cape Shirreff), there are as yet few guidelines to control the activities of parties in relation to cultural sites, and in many cases the presence and location of sealing sites is not identified in any documentation provided to parties, even in the ASPAs.

In the 1950s and 60s parties of geologists and naturalists identified many sealing sites, and in several cases were directed to 'investigate' these, informally excavating several sites on the Byers Peninsula, for example (see Lewis-Smith and Simpson 1987). This work was well-intentioned, but effectively and extensively disturbed several of the most important sites in the area. Increased sensitivity to the research and conservation potential of archaeological sites has increased in recent decades, but there is still a problem in the mechanisms to control damaging activities.

A recent example of impacts attributable to a geological party was noted by the author and his Chilean Argentinian colleagues on the Byers Peninsula, Livingston Island, in early 2007. The geologists has pulled down the dry-stone walls of a hut built against a cliff to provide a base for a drilling machine to take sample cores from the cliff face above the site. The hut site (Viotor 1) was very obvious, being a square of 3 m x 3.5 m, with one metre wide stone walls standing to a height of up to 800cm, with whale ribs inside the structure imbedded in fallen stones. The cliff extended tens of metres each side of the hut site that would have provided similar access for core sampling.

Controls need to be strengthened to prevent such mindless if not wilful damage. The sites need to be specifically identified in the citations for the ASPAs, and sites in non-protected areas need to be identified in other documentation accessible to all ATO parties. Guidelines should be included in ASPA documentation (available to all field parties) for responsible behaviour at identified (and newly located) historic sites. All such sites (pre-1958) are officially protected until fully researched and assessed (Resolution 4 (2001) of the Antarctic Treaty Consultative Meeting), but guidelines to implement that blanket protection has not yet filtered down to the level of information provided to field parties. Physical signing of sites would be understandably resisted in what are effectively wilderness areas, but may be necessary if repeat damage is done to sites near the locations of regular field camps.

Animal activity

A number of sealing sites have been impacted by the movements of elephant seals and penguins. Elephant seals rest and sometimes wallow in cultural sites, because they offer sharp-edged stones and timber that can be scratched against to remove irritating skin during the annual moult. Elephant seals (which can be 5 m long and weigh up to 3.6 tonnes) also move across sites as they travel along the beaches or across them to melt water pools further inland, dispersing stones and crushing artefacts as they pass.

Penguin guano and soil destabilised by breeding birds can bury artefacts and even whole sites that are located on or near rookeries, though this is a less common threat than Elephant seal disturbance.

The threat from animal activity is relatively minor, although several sites recorded in the 1990s on the Byers Peninsula (Zarankin & Senatore 2005) were very hard to discern in a 2007 re-survey, due to elephant seal disturbance. Monitoring will continue, and one option is to protect heavily impacted sites with seal fences, such as were installed on Macquarie Island in the 1980s and 90s. However, these are very unsightly, and their construction may be resisted by the parties operating in the region. If physical protection is not feasible, full recording and excavation may be the only alternative, leaving the sites to be destroyed by seal traffic.

Drifting sand

Drifting sand has partially buried most sealing sites, and thus protected them for nearly 200 years. However, in a few cases the comparison of early 1990s and 2007 survey evidence indicates that less obvious sites, with low or dispersed walls (sometimes the result of seal movement) can virtually disappear under sand drifts. This is not a conservation problem so long as the sites are well surveyed and can be relocated for monitoring or research at a later date. Recent surveys have used GPS data to provide more accurate locational information for sites, and previously known sites are gradually being re-surveyed using GPS. These locations are being placed on a new generation of maps for the region being prepared by the Chilean cartographic office, and will be progressively added to the GIS-driven mapping system as they are provided by future surveys.

Antarctic management context

The unique operation of the Antarctic Treaty means that no one nation is automatically responsible for the management of particular sites. In the case of the Heroic Era huts, being the Mawson, Scott, Shackleton, Borchgrevinck and Nordenskjold Huts, the huts themselves are the property of particular nations, and that determines who has responsibility. However, in the case of the nineteenth century sealing sites, no national claims ownership have been made the sites or objects, and the Treaty sets aside the overlapping claims of sovereignty over the South Shetlands held by Britain, Chile and Argentina. While archaeological research has been carried out by various countries, no serious conservation efforts have yet been initiated in the South Shetlands, and it remains to be seen if such work will be initiated by any of the Treaty parties, or whether other parties might object to (and hence veto) such work as overtly strengthening sovereignty claims.

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