Introduction

For yacht owners the Antarctic presents a unique, remote and challenging destination. Since the first recorded visit by a private yacht, made by Bill Tilman in the 1960s, numbers have steadily grown and a typical season may well see 20 to 30 yachts visiting Antarctica. Of these many are commercial charter operations, but a significant number of private yacht owners undertake expeditions each year.

Antarctica is one of the most remote and serious cruising areas in the world's oceans. Weather conditions can be extreme, ice can pose a danger at any time and no external assistance is available should things go wrong. Any yacht expedition heading south of 60° will need to be well planned, prepared and crewed by experienced yachtsmen. That said an expedition to Antarctica will almost certainly be a highlight of any sailor's time at sea.

The Antarctic is unique in that its administration does not fall to any one country. It is regulated via the Antarctic Treaty (AT); original signed by twelve countries in 1961 and now acceded to by 47 countries. Under the AT, individual countries implement the various regulations and provisions (arising from the Treaty's Protocol on Environmental Protection) via their national legislation. Over the years significant protocols and regulations have been agreed between the parties and enacted into domestic law. For example, under UK law, any British vessel or any person on a British expedition to Antarctica must have a permit and strict penalties exist for proceeding south of 60° without one.

These guidelines have been produced to aid private yachts planning on visiting Antarctica review the considerations they should take. They focus primarily on the most popular cruising ground of the Antarctic Peninsula and outline the principles of the United Kingdom permitting system.

Yachting in Antarctica

Cruising areas and routes

Although Antarctica covers over 17 million square kilometres, the vast majority of yacht visits are to the South Shetland Islands and the Antarctic Peninsula which stretches towards the tip of South America. This region provides the shortest sea route to the continent, is relatively well charted and can regularly have more favourable ice conditions than other areas. Typically yachts will depart from one of three gateway ports, Stanley in the Falkland Island, Ushuaia in Argentina or Puerto Williams in Chile. Many itineraries will see an initial landfall in the South Shetlands before heading down the west side of the Peninsula. Due to the more challenging ice conditions and the limitations in quantity and quality of anchorages, few vessels venture south of the Argentine Islands at 65° 15' S 64° 16' W, in to the Weddell Sea or further afield in Antarctica.

The Antarctic season

Antarctica is only accessible to most vessels during the Austral summer. The Antarctic Peninsula is amongst the first areas where the ice diminishes sufficiently to allow safe navigation. Typically expeditions take place from November to March with the months of December, January and February providing the longest daylight hours and generally better ice conditions.

Weather

The weather patterns in the region are primarily dominated by the succession of depressions passing continually through the Drake Passage from west to east and the high pressure area over the Antarctic land mass. There are significant variations in the typical weather that will be encountered.

The Drake Passage has an unrivalled reputation as one of the most challenging sailing areas in the world. Modern weather forecasting now means that the huge winds and seas for which this passage of water has become famous can at least, for the most part, be predicted. With a good understanding of the region's weather systems, access to sufficient weather data and careful planning, the worst of conditions can hopefully be avoided. However, in this turbulent area, forecasts change quickly and conditions often exceed those forecast. It is not uncommon for very complex low pressure systems to develop in the passage. Wind speeds encountered within these low pressure systems regularly exceed 50 knots and very large seas can develop.

The South Shetland Islands lie very much in the path of the depressions described above. The weather found here is therefore typically wet, windy and generally not very pleasant. This is reflected in the average recorded wind speed and precipitation on the South Shetland Islands which are consistently higher than those recorded at the scientific bases further south.
The weather on the Antarctic Peninsula is governed by the dominance of the Antarctic High Pressure system and the effect of the depressions passing through the Drake Passage. It is possible that when the high pressure becomes stable and dominant, the depressions are forced far enough north to give pleasant settled weather on the peninsula for days at a time.
Temperatures on the Antarctic Peninsula during the summer months can be expected to be between 5° and 10° during the day, falling to around -5° to zero at night. Wind chill can be a significant factor and at times makes the conditions on the peninsula inhospitable.

Ice

Ice in these waters originates from two sources: either from calving glaciers and ice shelves or frozen sea-ice. These types of ice differ greatly in their appearance and the dangers they pose to a vessel. The primary danger from ice occurs when it is unseen due to darkness, poor sea-state, fog or poor watch-keeping.
Most of the ice encountered is likely to be glacial and seen as ice bergs, bergy bits, growlers and brash ice (see below). The bergs can be very large, impressive and beautiful in their unique way. However, it must be remembered that they can turn over or split in half at any moment and without any warning. At such times, a sizeable berg can produce a very large wave and a safe distance, relative to the size of the berg, should always be maintained.
Over time, as an iceberg breaks up, it disintegrates forming progressively smaller lumps. Pieces of ice that rise less than a metre out of the sea are known as growlers, whereas larger pieces (up to 4 metres high) are called bergy bits. As a hazard to navigation, these smaller pieces of ice are the primary concern rather than icebergs. They are often difficult to detect with the naked eye and in certain conditions, they can be small enough to remain undetected by radar and large enough to cause damage. A good radar system, the ability to use it proficiently and a suitable ice light are all essential equipment in these waters.
The clearing of sea-ice on the Antarctic Peninsula during the summer varies greatly from year to year. Some useful bays and anchorages can be the last places to clear, as the process is dependent on local conditions of wind, sea state and current. As a general rule the ice clears at the northern end of the peninsula first. Constricted sections of water further south sometimes

do not clear even towards the end of the season and are often choked with a combination of sea ice floes and bergs.
A vessel can often also be threatened by ice while at anchor, with large pieces of ice moving remarkably quickly due to the wind or currents. In addition to the vessel being struck by encroaching ice it is also possible that larger bergs could block the vessel's exit from an anchorage or could position themselves above an anchor, preventing its retrieval.

Charting

Surveying and charting of Antarctica is by no means comprehensive and some of the formal charting of less visited areas dates back many years. Generally the degree of charting is proportional to the volume of traffic visiting an area, although it is still possible that a vessel may encounter uncharted rocks in any area. Electronic charting and GPS cannot be relied upon to fix a vessel's position in this region as much of the charting in the region derives its information from old surveys. The modern GPS equipment highlights the inaccuracies in these charts very clearly, resulting in significant errors in a GPS derived position, when plotted on a chart.

Vessel selection and preparation

A wide variety of yachts, both sailing and motor have visited Antarctica and there are no fixed criteria that ensure a vessel is 'Antarctica' capable. However the selection and preparation of a reliable well found yacht is fundamental to a safe Antarctic expedition. The first requirement is to be able to reach the continent and return safely through the large seas of the Drake Passage. Most of the commercial yachts regularly operating in these waters have been knocked down, and several have been rolled through 360 degrees. Any skipper should be mindful of this when preparing a vessel for the area.
Experienced yachtsmen who make frequent expeditions to the Antarctic favour vessels with metal hulls, either steel or aluminium. The inherent strength of the material and its ability to deform on impact, whilst maintaining hull integrity, are prime considerations when operating in these imperfectly charted and ice ridden waters.
Good ground tackle is essential. Suitable equipment is usually significantly heavier than that specified for normal cruising grounds in order to deal with the high winds that can be encountered in any anchorage and the typically poor holding afforded by the rocky nature of the sea bed. In addition it is often necessary to run long warps to the shore in order to back up the anchor.
A vessel without sufficient heating will lead to a very uncomfortable trip and increase the potential for medical difficulties related to the cold and damp.
Above all an expedition must ensure their absolute self sufficiency when operating south of 60°. There is no guarantee of assistance or back up of any kind that can be relied upon to arrive within several days (depending upon location and time of season). For essential systems or critical elements of such systems, strong consideration should be given to installing duplex arrangements such that a failure can be rapidly replaced. A very comprehensive spares selection and the necessary tools should be carried along with the knowledge and experience to resolve any serious problem that might arise.
Once leaving port in the Falklands or South America no fuel or other supplies are available. Sailing yachts should expect to make significant use of their engines. Particularly once on the continent, the wind is often too strong, too light or in the wrong direction to make sailing effective. In addition, the manoeuvrability afforded to a vessel under motor is often advantageous when moving in ice laden waters. Depending on the fuel tank locations, the viscosity of fuel may well be affected by the cold water temperatures and consideration should be given to adding cold weather treatments or purchasing treated fuel.
Whilst in some locations water can be collected from melting ice, those expecting to use water makers should be aware that their performance will be significantly reduced by the colder sea water temperatures.

Environmental and safety considerations

IAATO and the growth of Antarctic Tourism

Since the beginning of the modern Antarctic tourism industry in 1969, the number of tourists in Antarctica has grown from a few hundred to more than 30,000 each year. Recognizing the potential environmental impacts that such growing numbers could cause, the International Association of Antarctica Tour Operators (IAATO) works to promote and practice safe and environmentally responsible private-sector travel in this remote, wild and delicate region of the world. Currently, there are more than 100 members of the organization including cruise vessel operators, charter yachts and specialist support companies. Together they have established extensive procedures and guidelines that ensure the highest possible standards of private-sector travel to the Antarctic. In particular their guidelines for wildlife watching and boot & clothing decontamination are available via their website.

IAATO have a long history of working in conjunction with the governments of Treaty Parties, including the UK FCO, to promote safe and environmentally responsible tourism to the continent. One outcome of this co-operation has been the adoption of visitor guidelines for a number of the more popular landing sites in Antarctica (see below). The UK FCO encourages all visitors to Antarctica to travel with IAATO affiliated companies. Some members of IAATO specialise in assisting private yachting expeditions. Contact details are given in the Resources and Links section at the end of this document.

Site visitor guidelines

Visitor guidelines for some of the most visited sites have been adopted by the Antarctic Treaty Parties. These short, usually two page, documents provide a succinct overview of the site and essential information for any expedition such as landing areas, closed areas and sketch maps. They are available from the Antarctic Treaty Secretariat website.

Station visits

A visit to a working Research Station can be an interesting addition to any expedition giving an insight in to the lives and work of the scientists and staff based there. It should be remembered that the primary purpose of all stations is scientific research and any visits permitted are purely on a goodwill basis.
All station visits require advance approval. For UK British Antarctic Survey bases (Signy, Rothera) and the US Palmer base this should be obtained from the parent organisation well in advance of the expedition. Unannounced visits will be refused.
Some of the other bases may be willing to accommodate a visit at shorter notice if contacted once in Antarctica (typically 72 hours notice is requested).
In addition the UK Antarctic Heritage Trust has preserved the former British 'Base A' at Port Lockroy on Goudier Island as a 'living museum'. During the summer months the base is manned and frequently visited by vessels, providing a highly informative view of past and current Antarctic life. Visits for passing yachts are normally possible if the base is contacted in advance.

Waste

Detailed regulations apply to the disposal of waste in Antarctica, but the basic principle for all visiting yachts is 'if you take it in, take it out'. The full regulations are within the Treaty documents available via http://www.ats.aq/e/ep_waste.htm.
Sewage and liquid domestic waste may be disposed of into the sea. For vessels certified to carry more than ten persons this should take place a minimum of twelve miles from the nearest land or ice shelf and whilst moving at a speed of not less than four knots. For smaller vessels sewage and liquid domestic waste may be dispersed closer to land, but consideration should be given to its rapid dispersal and this should not be done in confined waters.

Off vessel activities

Potentially the most hazardous times during any expedition are when members are away from the main vessel, either in small craft or on land.

When operating in small boats, either cruising or making shore landings, a robust safety programme should be in place. It is not unusual for tenders to be unable to return to the mother ship due rapid changes in weather and/or sea conditions and at times this has necessitated an enforced overnight stay ashore. In conditions of fog or whiteout it is very easy for the crew of a tender to become disorientated and navigation to become difficult. Suitable precautions should be taken and emergency supplies and equipment carried in all tenders.

Ice is even more of a threat to a small boat than a ship. Icebergs can be liable to split or turnover without warning and without any identifiable reason. In doing so they can cause a large wave capable of swamping a small vessel. Similarly tide water glaciers collapse frequently, especially on warm sunny or wet days, again causing large waves. When operating amongst sea ice or icebergs always be vigilant to its movement in relation to local currents. Pack ice can move very quickly potentially affecting small boat and shore operations, especially as the tide changes.

When ashore, all expedition members should be aware of the dangers of crevasses. In recent years all glaciated terrain has become more dangerous due to higher temperatures and at least one unfortunate yachtsman has died in recent years as a result of falling into a crevasse. It must be remembered that the dangerous crevasses are the ones that cannot be seen. Expedition members should only venture on to snow slopes with the utmost caution and with the appropriate equipment and skills.

Further information & assistance

The Foreign Office is happy to discuss applications prior to submission. Further information and advice can be obtained from: Polar Regions Unit, Overseas Territories Directorate, Foreign and Commonwealth Office, King Charles Street, London SW1A 2AH. Tel: 0207 008 1921; Fax: 0207 008 2086. The publication "Guide to Environmental Impact Assessment of Activities in Antarctica" can also be obtained from the above address.

More details on many of the topics above can be found on the Foreign Office, Antarctic Treaty Secretariat and IAATO websites (links on following page). In addition certain member companies within IAATO specialise in assisting private vessel expeditions to Antarctica.

Resources and links

Weblinks

UK Foreign & Commonwealth Office – Antarctic pages
http://www.fco.gov.uk/en/fco-in-action/global-network/antarctica/

Antarctic Treat Secretariat
http://www.ats.aq/e/ats.htm

International Association of Antarctic Tour Operators
http://www.iaato.org/index.html

British Antarctic Survey
http://www.antarctica.ac.uk/

UK Hydrographic Office
http://www.ukho.gov.uk/

Antarctic Heritage Trust
http://www.heritage-antarctica.org/aht.htm

Books

Southern Ocean Cruising – Sally & Jerome Poncet, http://www.era.gs/resources/soc/index.shtml

Marine Rescue Co-ordnination Centres

Contact details for **Marine Rescue Co-ordination Centres** covering Antarctica can be found in the current Admiralty List of Radio Signals, Volume 5, Global Maritime Distress and Safety System.

The Foreign and Commonwealth Office would like to thank High Latitudes Limited for preparing these advisory guidelines. High Latitudes are a consultancy service specialising in assisting private yachts visit the Antarctic, Arctic and other remote destinations www.highlatitudes.com.