



The Natural History of Tristan da Cunha



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Habitats

What is a habitat?

A habitat describes the kind of place where animals and plants live.

There are different habitats in Tristan where you will find different kinds of animals and plants living. For instance at the patches you will find lots of farm grass, whereas up on the base there will be lots of bog ferns growing - these plants are different because they live under different conditions.

What makes habitats the way they are?

The reason one habitat is different to another can depend on a number of things. For example, some plants need shelter, some can't survive being frozen, and some prefer very wet soil. So the plants that grow in a particular place will be those that are best able to survive the conditions found there. Likewise animals will prefer to live close to the food that they eat, or suitable nest sites, or away from their enemies. At least animals can move to their preferred habitat; plants are fixed in one place and can move to new areas only by seeding new plants - if a seed lands somewhere that doesn't suit it, it will probably not survive.

Looking up the mountain from the Base. It is easy to see how the habitats change as the altitude increases - here you can see bogferns (dark green), upland grassland (bright green), moss (pale green) and right at the top, cinders (grey)

What are the main habitats on Tristan?

The main habitats found on land on the main island of Tristan are described in the following pages. They are mainly recognised by the kinds of plants that grow there.

What makes them different?

Altitude - some plants can stand the cold better than others - the higher you go the colder it gets

Moisture - some plants do better in wet conditions than others

Shelter - Some plants such as trees prefer places where it's not too windy

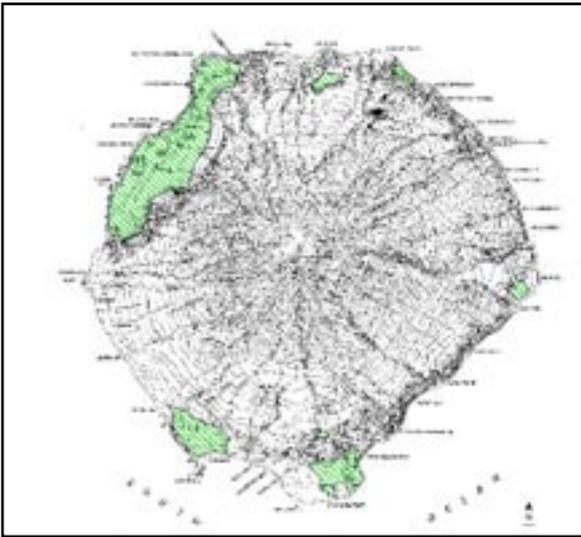
Rock and soil type - some plants can live on bare rock but most need some kind of soil

Grazing - grass does particularly well in places where animals graze, whereas other plants might be killed





Lowland grassland



Lowland grassland is found where people graze their animals. From the settlement to Burntwood the ground is fairly flat and is covered with various grasses that have been brought in from outside. Similar areas are found at Rookery Point, Caves and Sandy Point.

When people first came to live on Tristan, it would have looked very different. The flat areas of ground will have been covered with dense tussock grass where penguins and albatrosses would breed, very similar to what you will find today on the flatter areas of Nightingale and Inaccessible islands. Slowly this was cleared away to allow people to grow crops and to make thatch for their roofs, and now the only place you will find tussock grass on Tristan is in small tufts growing close to the cliffs.

Grass is an unusual plant because it likes being eaten!

Unlike many plants, grass grows from the bottom of the plant, not the top.

If an animal such as a sheep grazes, plants that grow from the top (such as trees) have all their buds removed and struggle to recover. Grass however just sends up new leaves from the ground and recovers quickly.

After a while, most other plants will die out leaving grass to take over.

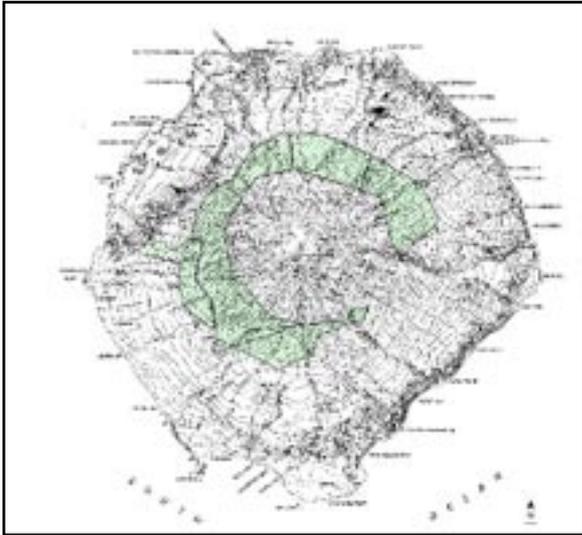
Without grazing animals (or lawn mowers which do the same job!) bigger plants such as trees would eventually take over.



Cattle grazing lowland grasses at Caves



Upland grassland



Above the cliffs on the Base of Tristan you can find large areas where non-native grasses have taken over from the plants that originally lived there. Some of these are farm grasses like those growing on the low-land grasslands, and some are a kind of dock plant locally known as ‘sour-grass’. Both these plants are eaten by the sheep that live on the Base and provide much better food for them than the ferns and mosses that grow up there. These plants are less common where the sheep don’t go.



Sourgrass - Rumex acetosella



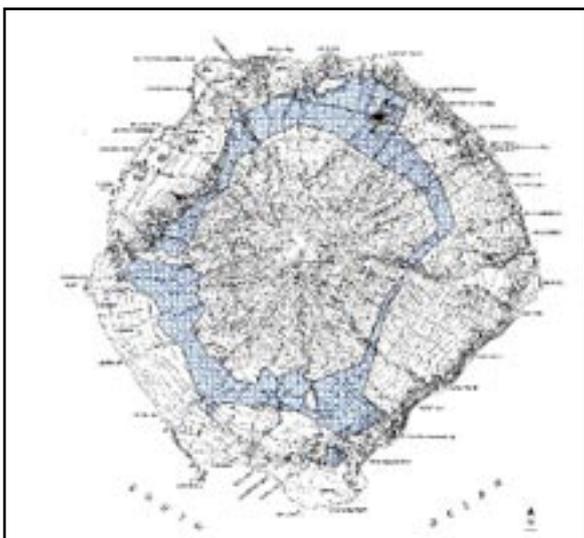
Farm grass - Holcus spp



Upland grassland on the Base above the Patches



Bog fern



Bog ferns grow well in the flatter parts of the Base where they cover large areas. This species of bog fern (*Blechnum palmiforme*) is found growing only on remote oceanic islands like Tristan.

Like other ferns they produce millions of tiny spores from spots beneath their fronds (leaves) which blow on the wind and grow into a new plant if they happen to land somewhere suitable.

In sheltered areas a bog fern plant can grow to a height of a metre or more.

Bog ferns grow well on Tristan, Inaccessible and Gough. On Nightingale however they are only found at the Ponds - everywhere else the ground is too dry for them.



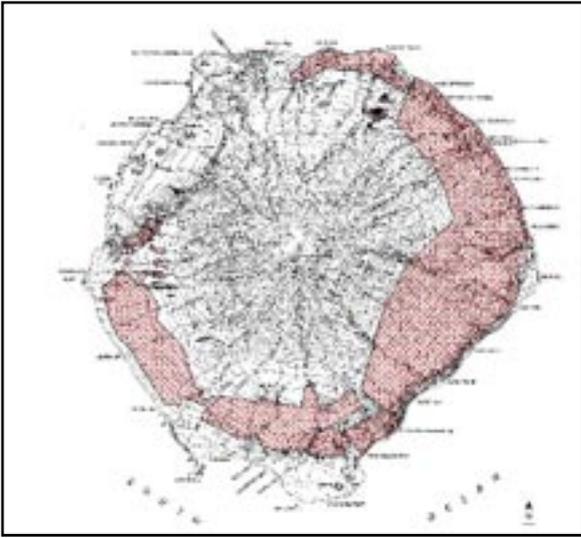
A bog fern plant in spring growing new fronds (the pale green ones in the middle)



Bog ferns on the edge of the Base at the top of Hottentot Gulch



Phylica trees (Island wood)



When people first came to Tristan the only kind of tree that grew here was the Phylica tree. A lot of it was cleared from the settlement area for use as firewood but there is plenty of it growing in other parts of the island, particularly on the Base at the east and south of the island. It also grows on the other Tristan islands.

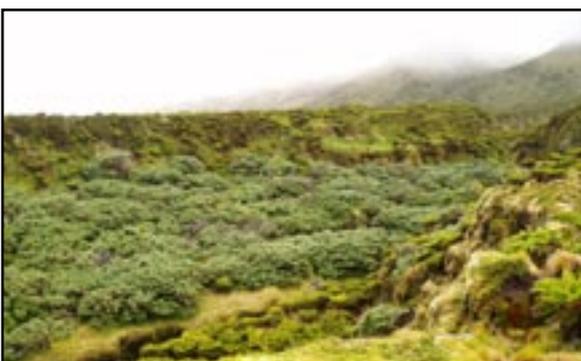
Phylica trees grow best where there is a bit of shelter. In very windy places, such as the top of a ridge, it will grow along the ground and hardly reach more than a few inches in height. In sheltered spots however it can grow into a full-sized tree reaching 7 metres or more.



Close-up of a Phylica tree showing its small leaves



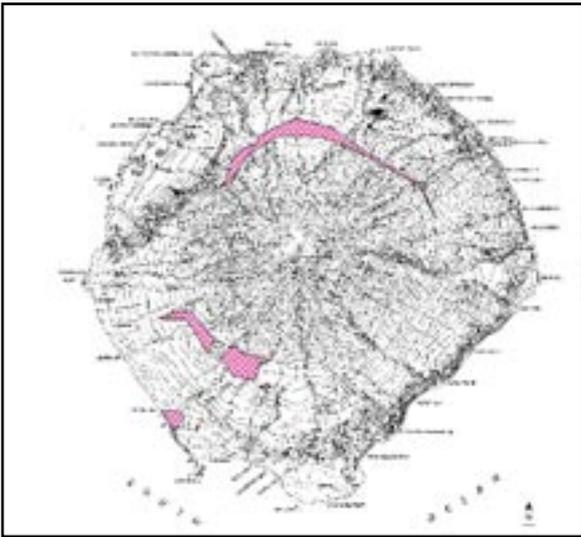
On the Base above Sandy Point looking up the hill towards the peak. This whole area is covered with Phylica trees which makes walking anywhere very difficult!



Phylica trees do well in sheltered spots like here in First Gulch.



Empetrum rubrum heath (Island berry)



The island berry plant *Empetrum rubrum* is found all over the island, very often mixed in with bog ferns and trees. The map on the left shows where it is particularly common. The small low-lying plants produce an astonishing number of berries which can be collected and eaten, although they do not taste of much. There is another plant growing here which is very similar in appearance but has paler berries.



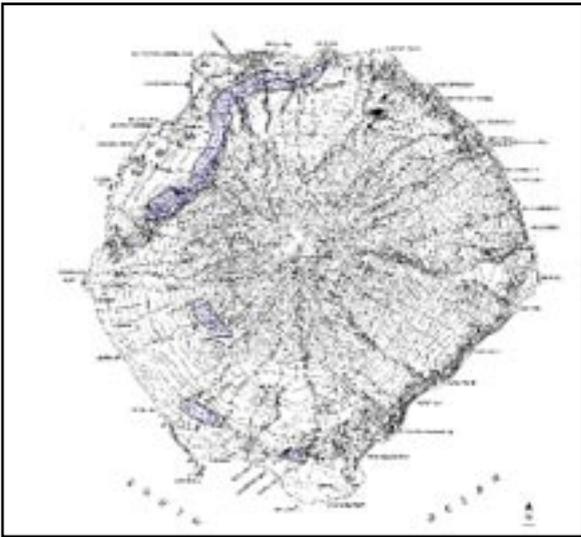
Island berry plants growing at high altitude at the edge of the scree zone.



In the summer time the plants will produce a good crop of berries



Blechnum penna-marina (Short fern)



On the steepest slopes and cliffs you will find a small pale-green fern. This is called *Blechnum penna-marina* and it has the ability to hold on to the rock faces where little else can. You can also find this plant growing anywhere there is bare rock, for instance above the cliffs above Runaway Beach.



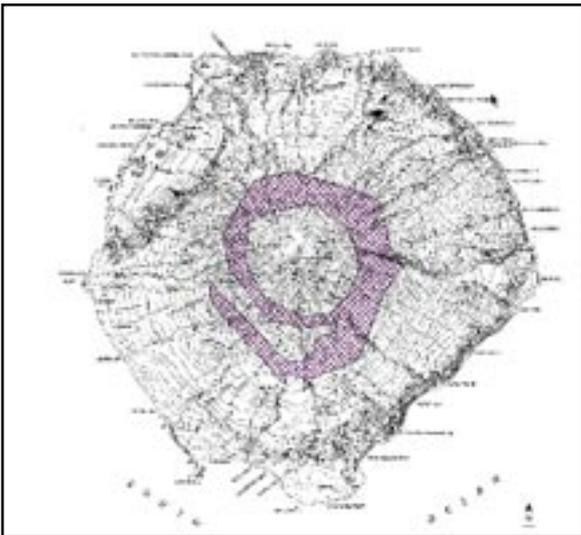
A close-up of the fern, showing the red underside of the fronds.



*The steep sides of Molly Gulch are covered in the grey-green fronds of *Blechnum penna-marina*.*



Moss and Island-berry heath



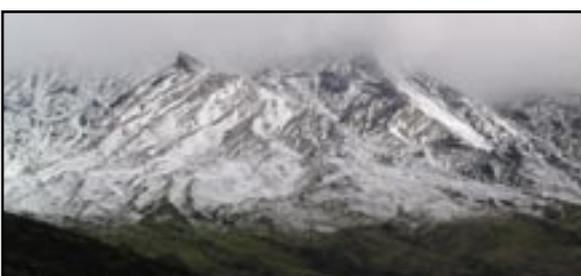
The higher up the mountain you go, the harder it is for anything to survive. Up here it is cold, wet, and very windy, and a lot of the year it is affected by frost and snow. Plants that live here grow close to the ground which helps them survive the harsh conditions. The commonest plants that are able to live here are the island berry plant (*Empetrum rubrum*) and a greyish-green moss called *Racomitrium*. Together these plants colonise the upper slopes of the mountain before the ground becomes too steep, loose and unstable even for them. Where the moss does grow it blankets large areas, but because of the loose ground and the fragility of the moss it is easily damaged by people walking on it.



Near the top of Big Gulch. At this altitude, mosses can survive the harsh weather better than most other plants.



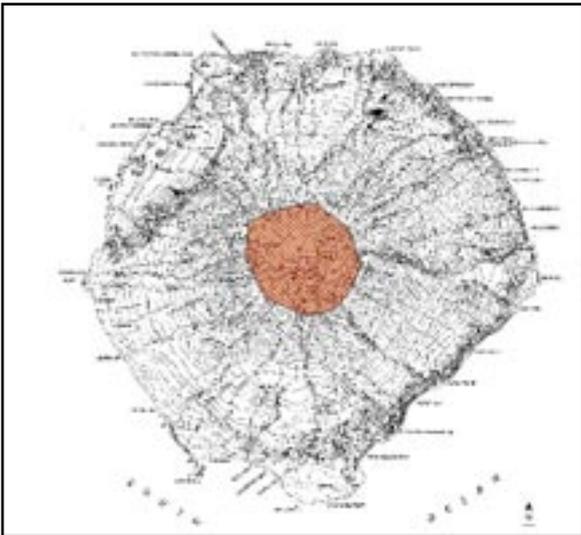
*This close-up shows the ground covered by *Rhacomitrium* moss (pale green) and island berry (dark green)*



The highest part of the mountain is covered in snow and ice for much of the year.



Scree



At the highest part of the island the slope becomes steeper. Here the ground is covered in small loose stones. This is called a scree slope and it is mostly made up of cinders from the top of the volcano. It is the most difficult place for anything to live - there is no soil here, the ground is loose and it is often covered by snow and ice. Some plants however manage to spread themselves across the loose stones and survive, particularly mosses and lichens which are the hardiest plants of all. A few other plants manage to cling to the occasional boulder or piece of firm bedrock that sticks out above the loose scree.



Close to the summit, very few plants can hold on to the loose stones and survive.



*Looking down the scree slope towards Cave Gulch Hill. The whiteish-green vegetation on either side is *Rhacomitrium* moss.*

A few plants can be found growing in the scree zone. In this photo, taken at an altitude of around 6000 feet, you can see an island berry plant, farm grass, mosses (greeny-brown) and lichens (pale grey).





Man-made habitats



Growing crops at the Patches feeds the people on Tristan, but can also introduce unwelcome pests such as slugs.

When people came to live on Tristan, they brought with them plants and animals that helped them to survive. Animals included sheep, dogs and cattle, and plants such as potatoes for food and flax for roofing and hedges. Grasses were also brought in for livestock to eat, and flowers for the garden.

When a new species is introduced into a place it can sometimes have unfortunate side effects on the native species that already live there. Introduced animals such as rats have seriously reduced the numbers of nesting seabirds on Tristan, and plants such as flax have escaped from pastures and gardens and spread to wild areas.

It is very important to prevent other animals and plants coming here which could have bad effects on the native wildlife, particularly on the offshore islands of Nightingale and Inaccessible, where the wildlife is of international importance and could easily be wiped out by alien invaders such as mice and rats.



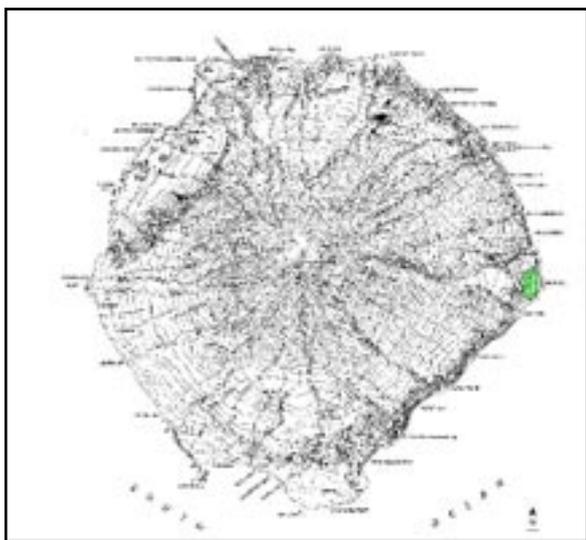
This flax plant has taken root at Pigbite thanks to a stray seed which landed on the hillside.



The dump provides food and shelter for rats and helps garden plants to spread to areas outside the village.



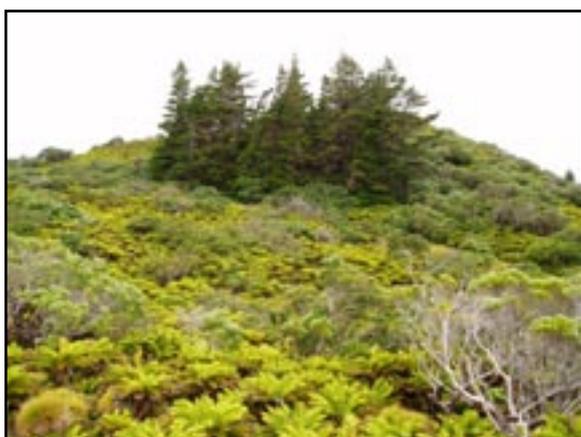
Mixed woodland



The woodland plantation growing at Sandy Point was deliberately planted to provide timber for the islanders. The trees are not native to Tristan but have been brought in from outside. There are many different kinds of trees growing here, including European pine trees and gum trees (also called Eucalyptus) originally from Australia. Brambles or loganberries do particularly well in woodland, and islanders have planted apple and peach trees here as well.



*A view of the plantation at Sandy Point. The bushes in the foreground are native *Phyllica* trees.*



These pine trees have spread to the top of the hill above the plantation. It is important to make sure they don't spread out of control or large areas of native tree habitats will be smothered by them.

Inside the plantation





BIRDS

What's so special about the birds on Tristan da Cunha?

There are very few species of birds at Tristan compared to most other places. So why do people think they are so important?

Tristan is a very long way from anywhere else. This means

- It is difficult for new species to arrive
- Species that did manage to get here have changed to adapt to island conditions
- Until the island was discovered by people the birds had few natural enemies

As the birds evolved to adapt to the island conditions, they eventually became new species. These are obviously not found anywhere else in the world - they are said to be **endemic** to Tristan.



The endemic Tristan bunting used to live on Tristan itself, but was killed off when people arrived by the destruction of its tussock-grass habitat, and predation by introduced mammals



The Starcky is endemic to Tristan - its is found nowhere else in the world. It is descended from thrushes that arrived from the mainland a long time ago

One example is the Tristan moorhen. A long time ago a moorhen must have flown all the way to Tristan - in fact several must have arrived at the same time because you need a few to make a breeding population. It settled here and, because it had few enemies, it did not need to be able to fly any more. Over the centuries, it lost the power of flight. Only when people came did it find itself in danger from animals which they brought with them. It was unable to escape and died out.

The Inaccessible Rail must have arrived here in the same way. Its ancestors almost certainly flew here but since then it has evolved into a flightless bird which won't now be able to migrate to other islands. It has no natural enemies on the ground so survives comfortably on its island. Predators arriving on the island such as rats or cats would find it easy prey and wipe them out in no time. This has already happened to many other creatures in many other parts of the world. Others on the brink of extinction are being saved by eradicating the alien invaders and restoring their natural habitat - New Zealand is a world leader in this field.



What about the seabirds?

Tristan is famous for its seabirds, not only because some are endemic, but also because they are so numerous, in some cases making up a large proportion of the world's population

What most people don't realise is that the birds that wander the oceans - such as the albatrosses, petrels and penguins - are perfectly at home on the sea and only come to land because they have to, in order to breed. Most seabirds are poorly adapted to life on dry land - they can't walk very fast and the smaller ones in particular are easy prey for predators (which is why most come in after dark, to avoid the skuas).

Seabirds put themselves at great risk when they come to breed on land, they are much safer out at sea.



An isolated island free from predators is the perfect place for a seabird city. As an added bonus there is usually much more food for seabirds in shallow seas close to land than there is out in the open ocean



Ring-eyes range far across the ocean but nest on only one island



The Sea hen's isolation from skuas in the rest of the world has allowed it to become slightly different to other skua species

Most seabirds return to their island of birth to breed. Over thousands of years this can result in them becoming different to their close relatives living elsewhere, and eventually they can become new species (or sub-species). This is true of Spectacled Petrels which only breed on Inaccessible - they are very similar to white-chinned petrels and maybe came from the same ancestors, but their isolation over thousands of years has allowed them to evolve into something slightly different.

The Tristan islands are relatively safe places for seabirds to breed because there are no rats or other mammal predators - at least there weren't until people accidentally brought them to Tristan and Gough. Like the flightless birds, a seabird's eggs and chicks are vulnerable to attack because they haven't adapted to sharing their island with mammals. One reason that the Tristan group of islands became one of the most important seabird islands in the world is simply because it was such a safe place to come to rear chicks. Because today's threats to them are caused by man, it is up to us to make sure they can continue to survive. Once a species is extinct, it is gone forever - there is no way of bringing it back.



Yellow-nosed albatross

Tristan name Molly
Scientific name *Thalassarche chlororhynchus carteri*

What does it look like?

Yellow stripe along top of beak
 Grey head
 Wings and back black above, white below



Where is it found?

The Atlantic yellow-nosed albatross is unique to Tristan, and breeds on all the Tristan islands.

What does it eat?

Mainly fish and squid, taken at the surface.

When does it breed?

A single egg is laid in late September/early October. The mollies on Nightingale seem to lay eggs a bit earlier than the birds on Tristan. The chicks hatch in November/December, and leave the nest in March.

What are the threats?

Many yellow-nosed albatrosses are killed when they get caught on fishing lines. This happens mainly off the coast of South America. Mollies used to be eaten by Tristanians but this is now against the law.



The molly builds its nest out of mud and lays a single egg.



A molly chick with downy feathers



The parents take it in turns to look after the egg or chick



Sooty albatross

Tristan name **Pe-oo**
Scientific name **Phoebetria fusca**

What does it look like?

Sooty brown all over
 Yellow stripe along base of beak
 White line above the eye

Where is it found?

The sooty albatross is found on all the Tristan islands and also on Crozet, Amsterdam and St Paul, Kerguelen, Prince Edward and Marion islands. These other islands are all in the South Indian Ocean, on a similar latitude to Tristan.

What does it eat?

Mainly fish and squid, taken at the surface.

What are the threats?

Many sooty albatrosses are killed when they get caught on fishing lines, particularly during tuna fishing in the Australian fishing zone.

When does it breed?

Sooty albatrosses nest every two years. The nests are built on ledges on cliffs - both sea cliffs and inland. The single egg is laid in a small nest mound in September and the chicks hatch in November. The chicks fly from the nest in April.



Adult sooty albatrosses prefer to nest on cliffs and ledges



Two sooty chicks on their nests



Tristan wandering albatross

Tristan name **Gony**
Scientific name **Diomedea (exulans) dabbenena**



What does it look like?

Very large - massive wingspan
 Adult male birds are mainly white, with black wings speckled with white.
 Younger males and the female birds are often brown
 (It looks the same as other wandering albatrosses)

Where is it found?

The Tristan albatross is only found on the Tristan da Cunha islands and is one of the rarest seabirds in the world. Nowadays they almost all breed on Gough, apart from one or two pairs that breed from time to time on Inaccessible.



An adult male tends the nest on Gough island

What does it eat?

Mainly squid and some fish, taken at the surface or by shallow diving.

What are the threats?

Many wandering albatrosses are killed when they get caught on fishing lines. Their chicks are attacked on the nest by mice on Gough. They may become extinct if nothing is done to help them.

When does it breed?

Pairs of Tristan albatross only nest once every two years. They lay one egg in January in a cone-shaped nest made of mud and plants. The eggs hatch in April, and the chicks leave the nest in November/December.

The adult birds spend much of this time at sea getting food for the chick. Once the chick leaves the nest and flies out to sea, it will remain at sea for several years. It will return to breed at the colony aged between 6 and 22 years old.



A male and female which will pair for life



A gony egg



Northern rockhopper penguin

Tristan name: pinnamon

Scientific name: *Eudyptes chrysocome moseleyi*

What does it look like?

Short, stumpy body, with black upper parts and white underparts

Bright yellow plume or tassel growing from eye-brows

Pink feet and red beak

Where is it found?

Different types of rockhopper penguin are found across the South Atlantic and the Southern Ocean, from the Falklands to the islands off New Zealand and Australia. The type found on Tristan is the Northern Rockhopper penguin, which is found only on the Tristan Islands and on Amsterdam and St Paul in the Indian Ocean. Rockhoppers breed on all the islands in the Tristan group. On Tristan itself there are six colonies or rookeries around the east coast and one at Stony Beach.

What does it eat?

Mainly fish which it pursues underwater

What are the threats?

Natural enemies include seals and sharks, as well as bigger birds like skuas and giant petrels.

When does it breed?

They come ashore in August and lay two eggs in early September. The chicks hatch in October, and are fed on the nest for a few days by both parents. One parent will look after the chick whilst the other goes out to sea and brings back food. The chicks then leave the nest and join a creche with other chicks where their parents continue to feed them. By January they are big enough to fend for themselves and head out to sea.



A pair of rockhoppers showing off their tassels



Rockhoppers at Nightingale



The chick on the left has lost its downy feathers but has yet to grow any tassels.



Tristan skua

Tristan name **Sea hen**
Scientific name **Catharacta antarctica hamiltoni**

What does it look like?

Large powerful brown bird
 White spots on the wings
 Hooked beak

Where is it found?

The Tristan skua is found only around the Tristan islands including Gough. It is very similar to the subantarctic skuas found in Falkland and other subantarctic islands in the Southern Ocean.

What does it eat?

Skuas mostly eat small fish and squid, but will also scavenge on dead carcasses and eat other birds' eggs and chicks. They also eat rats and mice on Tristan. Skuas are well known for piracy - they attack other birds and chase them until they regurgitate (sick up) their last meal. The skua will usually catch this food before it hits the sea. This saves it from the bother of catching its own fish.

What are the threats?

Skuas are not currently under threat but are sometimes persecuted by people on Tristan who are concerned that their lambs are being attacked.

When does it breed?

Two eggs are normally laid between October and November. Both parents raise the chicks and will aggressively defend the nest against any intruders. The eggs hatch after about a month and the chick leaves the nest after a couple of days. It takes another 40 to 50 days before they can fly and look after themselves.



An adult skua in a typical display posture

A skua will normally lay two eggs in a simple nest on the ground



This skua chick is only a few days old. It will run and hide if danger approaches.





Antarctic tern

Tristan name **Tern or kingbird**
Scientific name **Sterna vittata**

What does it look like?

Graceful white seabird with long tapering wings
 Black cap
 Red beak and legs
 Forked tail

Where is it found?

Antarctic terns are found throughout the Southern Ocean.

What does it eat?

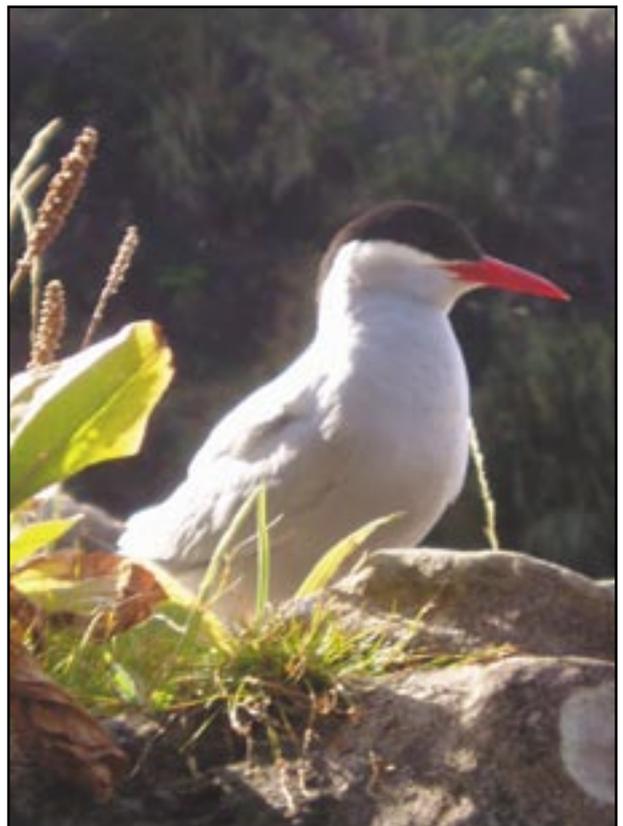
Mainly fish which it catches by plunge-diving. It will also feed on small invertebrates it finds on the shore, and in Tristan terns will often feed on worms and grubs at the Patches.

What are the threats?

Its main enemies are predators such as skuas and rats which take its chicks and eggs. Nesting birds are very vulnerable to disturbance from humans as well.

When does it breed?

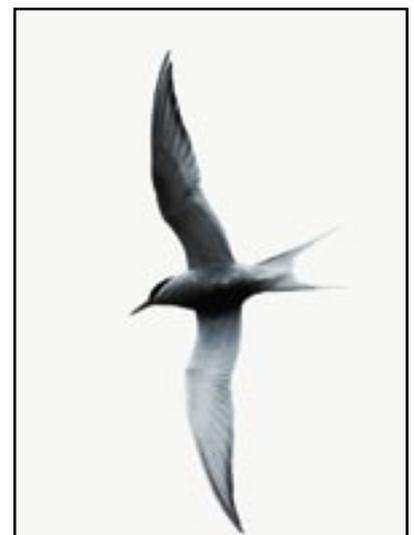
Terns make small nests, often on cliffs and ledges, where they lay 1 or 2 eggs in November. These hatch after about 24 days and after 4 weeks the chicks are able to fly.



An adult tern



Tern chicks are well camouflaged to hide them from predators



The tern's forked tail is very distinctive in flight



Giant petrel

Tristan name **Stinker**
Scientific name **Macronectes giganteus**

What does it look like?

A large dark-coloured petrel
 (occasionally white all over)
 Large pale beak
 Flies with stiff wings

Where is it found?

Giant petrels are found throughout the Southern Ocean. They often gather at food sources such as fishing boats.



Two adults hoping for a meal from a fishing boat

What does it eat?

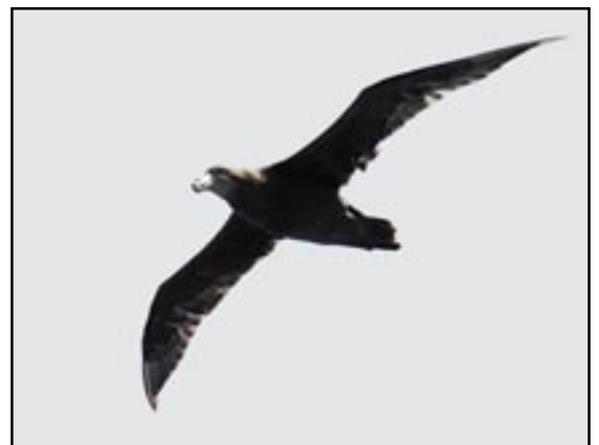
It is a scavenger, feeding on dead carcasses, and also a predator which will attack and kill other birds such as penguins. It will also seize small fish or squid from the surface of the sea.

What are the threats?

Giant petrels are vulnerable and declining. Human persecution and a reduction in their food supply may be responsible, and many are caught by longlining fishing boats.

When does it breed?

Giant petrels form small colonies on exposed ridges on Gough. One white egg is laid between August and October which takes about 2 months to hatch. Both parents look after the young, which fledges after another 4 or 5 months.



A giant petrel in flight



Great shearwater

Tristan name Mutton bird
Scientific name *Puffinus gravis*

What does it look like?

Brown above and white below
 Black cap
 Long delicate beak with hooked tip
 Wingspan of about 1 metre
 Flies with stiff wings alternately flapping and gliding

Where is it found?

The great shearwater breeds on all the Tristan islands and also in the Falkland islands. The total number is estimated to be 5 million pairs, of which around 4 million are on Inaccessible and Nightingale.

What does it eat?

Mainly fish and squid, taken at the surface or caught by shallow plunging.

What are the threats?

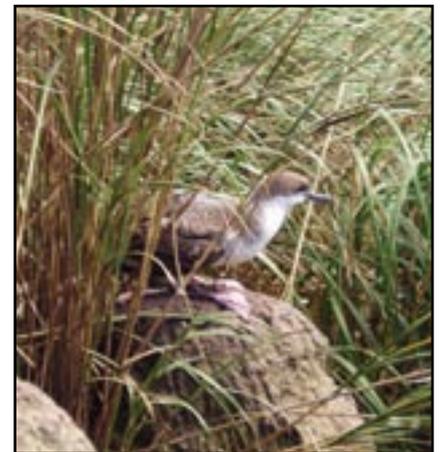
Not globally threatened, but many are collected from Nightingale by Tristanians for food.

When does it breed?

Great shearwaters nest in burrows which they dig out of soft soil beneath tussock grass. Adults arrive at the breeding colonies in September, and spend some time courting and cleaning out burrows. The birds then all leave for a few weeks, returning to lay a single egg in late October to November. The eggs hatch in late December/January and are fed by both adults until they leave the nest in May. The great shearwaters spend the winter at sea, travelling to the north Atlantic, as far as the Arctic circle.



Great shearwaters travel the world's oceans



A great shearwater prepares to take flight on Nightingale



A great shearwater on its nest inside its burrow



Spectacled petrel

Tristan name **Ring-eye**
Scientific name **Procellaria conspicillata**

What does it look like?

Dark brown all over
 Conspicuous white ring on each side of head (some individuals have more white than others)
 Typical stiff-winged petrel flight

Where is it found?

The spectacled petrel ranges far across the South Atlantic but breeds on only one island in the entire world - Inaccessible Island.

What does it eat?

Mainly fish and squid, taken at the surface. They also like to follow fishing boats in the hope of getting discarded fish, which is when they put themselves in danger.

What are the threats?

Many ring-eyes are killed when they get caught on fishing lines, particularly off the coast of South America. These birds are critically endangered. If rats ever reached Inaccessible they would almost certainly be completely wiped out.

When does it breed?

Ringeyes make a burrow in marshy areas on the top of Inaccessible. Each burrow has an unusual water-filled pond at its entrance. Adults call from the burrow with a strange pig-like squealing call. A single egg is laid in late October/early November. Both parents look after the young.



An adult bird at Inaccessible Island



A ring-eye burrow is easily recognised by the water-filled entrance



Broad-billed prion

Tristan name **Nightbird**
Scientific name **Pachyptila vittata**

What does it look like?

Blue-grey above, white below
 Very broad, black beak

Where is it found?

Occurs between Tristan and South Africa, and around New Zealand. Gregarious (likes being in a group). Breeds on all Tristan islands, and on islands off New Zealand.

What does it eat?

Small fish, squid and crustaceans, taken at the surface or just below.

What are the threats?

Not globally threatened, although predation by rats is a big problem where they occur eg on Tristan. Natural enemies include skuas and large gulls.



These legs weren't made for walking! Like most birds of the the ocean prions are much better at swimming than moving about on dry land.

When does it breed?

Nightbirds build their nests between August and September in burrows or in caves, or the spaces beneath boulders. Also underneath huts on Nightingale where their noisy calling and squabbling can go on all night! One egg laid, young looked after by both parents who wait for darkness before coming to the nest, thus avoiding predators such as skuas.



The extraordinary beak is used to scoop food from the surface of the sea.



A prion egg found in a cave on Tristan. It has been eaten by rats.



Tristan thrush

Tristan name **Starchy**
Scientific name **Nesocichla eremita**

What does it look like?

Brown speckled bird
 Black beak

Where is it found?

The starchy is found on Tristan, Nightingale and Inaccessible. It is unique to these islands - it is found nowhere else in the world. For some reason they do not usually frequent the settlement on Tristan, but show no fear of people where they do occur. On Tristan you are most likely to see one up on the Base, but on Nightingale and Inaccessible they are also seen at sea level and around (and sometimes inside!) the huts.

What does it eat?

Starchies eat insects, dead animals and birds, and will eat other birds' eggs if they get a chance.

What are the threats?

Rats pose a problem to the birds on Tristan and have almost certainly caused a reduction in their numbers here. The starchies living on Tristan, Nightingale and Inaccessible are slightly different to each other - if birds were carried between islands they might interbreed and the special character of birds at each island would be lost.

When does it breed?

A nest is built on the ground or in plants just above the ground. Two to four eggs are laid in September to November, and the chicks hatch about two weeks later. The young are fed by both adult birds, and can fly about 20 days after hatching.



A starchy on Inaccessible



A starchy eating a skua egg on Nightingale



Starchies are tame and inquisitive!



Tristan bunting

Tristan name **Canary**
Scientific name **Nesospiza acunhae**

What does it look like?

Small with heavy beak
 Green above, yellow-green below
 Often seen perching on tussock grass or bushes
 Twittering, chirping song

Where is it found?

The bunting used to be found on all Tristan islands, but those on the main island have died out. This bird still occurs on Nightingale and Inaccessible; the one on Gough is a different species. There is another bunting (Grosbeak bunting) with a much bigger beak on Nightingale and Inaccessible which sometimes interbreeds with this bird. Tristan buntings are found nowhere else in the world.

What does it eat?

Buntings eat fruits and seeds of plants including island berry, Phylica trees and tussock grass, as well as insects and other invertebrates.

What are the threats?

Buntings used to be common and widespread on Tristan but have now died out. Buntings would be at serious risk of extinction if rats or mice reached Nightingale or Inaccessible, or if their habitat was destroyed.

When does it breed?

The female builds a nest on the ground or in tussock grass, and lays 1 or 2 pale blue eggs sometime between October and February. The eggs are incubated by the female for 18 days and the chicks leave the nest 3 weeks later.



A bunting perched on tussock grass on Nightingale



A Tristan bunting on Inaccessible looks for food



Moorhen

Tristan name **Island cock**
Scientific name **Gallinula comeri**

What does it look like?

Black plumage, white on tail
 Distinctive red 'shield' on face
 Yellow tip to beak
 Unable to fly

Where is it found?

This bird is found nowhere else in the world apart from Tristan and Gough. There used to be two different species of moorhen here - one on Tristan, one on Gough. The species that lived on Tristan became extinct after human colonisation but birds from Gough were brought to Tristan where they seem to be thriving. Moorhens are very good at hiding themselves as they move about and are more often heard than seen.

What does it eat?

Moorhens will eat a wide variety of foods, including seeds, plants, insects and other invertebrates, as well as carrion.

What are the threats?

Because they cannot fly they are unable to colonise other areas, so are vulnerable to new threats. Although the birds on Tristan seem to survive despite the rats and mice, they could still be badly affected if cats or wild pigs were reintroduced to the island.

When does it breed?

Moorhens breed between November and March, and can raise 2 broods in a summer. Between 2 and 6 eggs are laid in a well-hidden nest and are incubated for 21 days. Young from the first brood sometimes help their parents feed the young from the second brood.



An adult moorhen shows itself for an instant



A moorhen's nest with 3 eggs



This unfortunate moorhen chick was killed by an islander's dog



Inaccessible island rail

Tristan name **Inaccessible rail**
Scientific name **Atlantisia rogersi**

What does it look like?

Small black bird
 Long beak
 Red eye
 Small stiff tail
 Unable to fly

Where is it found?

This bird is found nowhere else in the world apart from Inaccessible Island. It creeps around beneath the ferns and tussock grass and rarely shows itself in the open during the day for fear of being attacked by the many skuas that also live there. The easiest place to see one is beneath one of the large *Phyllica* trees.

It is the smallest flightless bird in the world.

What does it eat?

The Inaccessible rail will eat a wide variety of foods, including seeds, berries, insects and other invertebrates such as earthworms.

What are the threats?

The main threats encountered by these birds are bad weather and attacks by starchies. Because they are found nowhere else they could easily be wiped out if rats or mice were ever to get to Inaccessible island.

When does it breed?

Rails build a nest woven into a dome-shaped structure with an access track or tunnel. Two cream-coloured eggs are laid between October and March. Both parents defend the nest and feed the chick.



photo: mike pienkowski

An Inaccessible rail seen at Salt Beach



Marine Life

Not a great deal is known about the sea life around Tristan. This is mainly because it is so difficult to see. Whereas all you need to see a bird is a pair of binoculars, to see a living sea fan you have to go out in a boat, put on heavy scuba gear and dive down 40m or more. Even then you are limited by the amount of time you can spend down there - at 40m you have only about 10 minutes before its time to come back up. Not only that, the seabed drops away to thousands of metres just a short distance from the shore. Nobody has seen what lives down there, you'd need a special submarine to find out. So it is little wonder it has been studied so little.



photo: sue scott

A diver explores the kelp forest

The sea around Tristan is full of life, and it is easy to catch fish and crayfish here. It used to be like this nearly everywhere, but sadly most places in the world have suffered from over-fishing and bad management. Tristan islanders have thankfully not destroyed their fishery for short-term gain, nor allowed anybody else to do so, and continued careful management will ensure that the sea continues to be as productive tomorrow as it is today.

Sadly the same cannot be said for Tristan's marine mammals. The huge numbers of seals and whales that used to live here were almost exterminated by greedy hunters, and the numbers seen today are a small fraction of what once lived here.

Kinds of marine life

Plants include all the different seaweeds (called algae). The most numerous plants in the sea however are almost invisible to the naked eye - these are tiny plants that float in surface waters called phytoplankton.

Animal life includes fish, sponges, starfish, urchins, anemones and molluscs, all of which can be seen in rockpools. Seals and whales are also found here.

Kinds of fish

There are basically 2 kinds of fish - bony fish and fish with cartilage skeletons. Most fish in the world are bony fish, only sharks and rays have cartilage instead (cartilage is the bendy stuff inside your ears and the end of your nose).



A bony fish (above), and a cartilaginous fish (below)



The next few pages show you what there is to see in the shallower waters around Tristan's coast, including some of the fish in their natural habitat.



Seven-gilled shark

Tristan name **Rock shark**
Scientific name **Notorynchus cepedianus**

What does it look like?

Large fish up to 3m long
 7 gill slits
 Dark grey with small spots above, white below
 Large mouth
 Broad blunt snout

Where is it found?

The sevengill shark is found in all oceans with the exception of the north Atlantic Ocean and the Mediterranean Sea. In the Atlantic Ocean, it is found from southern Brazil to northern Argentina and from Namibia to South Africa. In the Pacific Ocean it occurs from southern Japan south to New Zealand, including Australia, and Canada south to Chile.

What does it eat?

The sevengill shark is an opportunistic predator that feeds on almost anything including sharks, rays, dolphins, and seals as well as bony fish such as salmon, herring, and anchovies. It also feeds on carrion such as dead seals or whales.

Sevengill sharks sometimes hunt in packs, working as a team to capture large prey such as marine mammals and other sharks. Another hunting tactic is to sneak up on prey from behind, quickly dashing at the last moment for the capture.

How does it breed?

The eggs hatch and develop inside the female's body for 12 months before they are born. Each litter may number up to 82 pups, each measuring about 16-18 inches in length.



The 7 gill slits are very distinctive. Most sharks of the world have only 5.



The large mouth is ideal for seizing large prey



The teeth in the right half of the mouth. The top teeth are ideal for gripping prey, while the serrated lower teeth slice through it



Tristan wrasse

Tristan name Concha
Scientific name *Nelabrichthys ornatus*

What does it look like?

Brightly coloured
 Males multi-coloured; females mostly orange
 Long dorsal fin

Where is it found?

The Tristan wrasse has been found only at the islands of Tristan and around Marion Island. It is common around the inshore rocky reefs and kelp forests .



A male wrasse puts on a display for another male and female. As you can see in the photo above it spreads its fins wide to make itself look as big, colourful and impressive as possible. It can also make its back turn white as part of the display - in a few seconds it will return back to normal.

Like many other species of wrasse in the world, the Tristan wrasse starts life as a female and when it grows big enough, it changes into a male!



The male Tristan wrasse is very brightly coloured



This female Tristan wrasse is less gaudy than the male



Five-finger

Tristan name **Five-finger**
Scientific name **Acantholatris monodactylus**

What does it look like?

Silvery fish with small dark spots
5 or 6 dark vertical stripes on back
Deep-bodied, laterally compressed

Where is it found?

The five-finger is found only at Tristan and at similar islands in the South Indian Ocean such as Marion Island, Amsterdam Island.

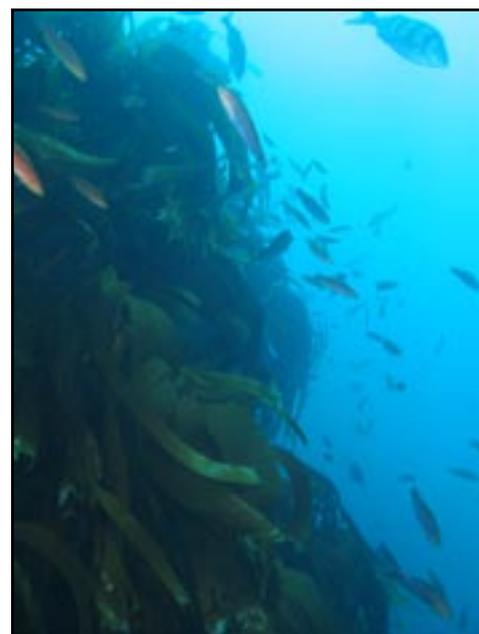
At Tristan it is the most numerous fish, occurring in large shoals throughout the kelp forests and at least as far down as the edge of the drop-off.



Large shoals of Five-finger cruise around the kelp forest, always on the look-out for food



It's not difficult to see how this fish got its name!



A typical reef edge in Tristan. The 5-finger and wrasse seen here can quickly hide in the kelp forest if danger threatens



Other fish



A False jacobever (top, with spots) seen together with a similar species, the Soldier (below)



A yellow variety of the False jacobever



In the summertime large numbers of Horse mackerel arrive to feed on the plankton



*This fish *Medosoma lineatum* is not rare but is seldom seen because it will not take a baited hook*



Tristan's endemic Klipfish is found in shallow water and rockpools. It uses its fins and tail to brace itself against the heavy surf.



The Yellowtail or Cape mackerel is a fast predator built for speed. It has recently become very common in Tristan waters



Tristan crayfish

Tristan name **Crayfish**
Scientific name **Jasus tristani**

What does it look like?

Hard shell with reddish-brown colouration
 Long tail and 10 walking legs
 Long antennae

Where is it found?

The Tristan crayfish is found nowhere else in the world apart from a few seamounts in the open ocean. This species of crayfish is broadly similar to other crayfish found in other parts of the world. Crayfish are normally found on rocky reefs, particularly on exposed oceanic coasts.

What does it eat?

A wide variety of animal and plant foods, including seaweed and carrion.

How does it breed?

The female lays several hundred eggs which are fertilised by the male. The 'berried' female carries them beneath its abdomen until they hatch. The small larvae are free-swimming, feeding on smaller plankton. When they are large enough they settle on the seabed as miniature crayfish. It is a mystery how they do not get swept away from Tristan on the ocean currents.

How does it grow?

Because it has an exoskeleton ('exo' means 'outside') it has to cast off its shell to grow bigger. Its a bit like living inside a suit of armour - the suit cannot grow any bigger, you just need a bigger suit. The crayfish emerging from the old shell is soft. It pumps itself up with water before the new shell hardens, and will slowly grow inside to fill the new shell. This is when it is at its most vulnerable - the soft shell is an easy target for a hungry octopus.



A Tristan crayfish. As well as its 10 walking legs it has several other modified legs which it uses to handle its food, and antennae to taste the water



Tristan crayfish are found in very large numbers thanks to careful management of the fishery



photo: sue scott

Fishing for crayfish. Tristan's economy depends almost entirely on selling these shellfish. The survival of the Tristan islanders' way of life therefore depends on managing the stocks wisely



Seaweeds (Algae)

What do they look like?

Seaweeds, or algae, are mostly soft and slippery. There are 3 kinds of algae growing in the sea - red, green and brown.

Where are they found?

Algae are usually attached to rocks or boulders by means of a holdfast. This looks a bit like plant roots but is only needed for attachment, whereas land plant roots also suck up water and fertiliser. Like other plants, algae need light to live. The deeper you go in the sea, the darker it gets. There comes a point where it is too dark for them to make their food - below this depth you will only find animals, no plants. The clearer the water is, the deeper light penetrates. The water around Tristan is clear enough for algae to live at depths of 40m or more.

Red algae (92 species) can survive with the least amount of light, so these can live deeper than the others.

Brown algae (21 species) includes 2 species of kelp. Giant kelp *Macrocystis pyrifera* is the biggest seaweed in the world, growing to a length of 40m or more. It has gas-filled floats which hold the plant up towards the light. The kelp forests around Tristan damp down the waves and protect the coastline from the worst of the weather.

Green algae (18 species) tend to be fast growing. They are commonly found in shallow areas where the sea regularly rips up the weed in storms.



A leafy red seaweed. Some red algae grow in a thin layer over the rocks that looks like pink paint (see urchin photo)



Green algae growing on top of Hagan's Breaker



The kelp's holdfast provides shelter for these anemones.



The gas-filled floats keep this giant kelp plant close to the light



Inside the giant kelp forest



Sponges

What do they look like?

Sponges are often found as thin layers encrusting rocks and seaweed holdfasts, though some are more lumpy and grow from a stalk.

Sponges can be recognised by the holes through which they feed and breathe.

There are several different coloured sponges in Tristan - some are dull grey while others are very brightly coloured.

Where are they found?

Growing on rocks or boulders, particularly where there is a lot of water movement.

How do they feed?

Sponges inhale (suck in) water through hundreds of tiny holes. Cells inside strain out bits of food such as plankton. The cleaned water is exhaled (squirted out) through the large conspicuous holes.



A white stalked sponge



Different coloured sponges growing on a seaweed's holdfast



The exhalant holes on this grey sponge can be clearly seen



The bright pink stuff and the big yellow blobs are different kinds of sponge



This bright blue sponge shares the rockface with feathery hydroids



Anemones, seafans and soft corals

What do they look like?

These animals all have stinging tentacles which they use to catch their food. Some are solitary, but many species such as soft corals and sea fans live in colonies.

Where are they found?

They live attached to rocks, or sometimes weed. Since they can't move they have to rely on their food to come to them - for this reason they are most numerous where there is a lot of water movement. If it gets really rough they can withdraw the tentacles and shrink to a very small size.

How do they feed?

They don't have to do much except hold out their tentacles and wait for something to bump into them - the prey is stung, seized, then transferred to the mouth which is located in the middle of the tentacles.

Their stinging cells are not powerful enough to affect us, but a close relative the Portuguese man-of-war (bluebottle) has stronger stingers that can penetrate human skin.



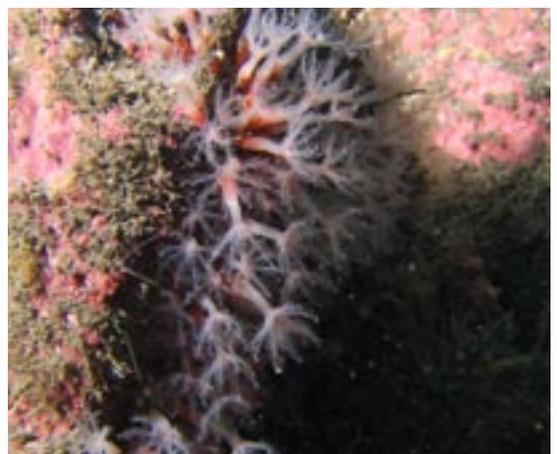
This spectacular seafan is found only in deep water. Each branch supports hundreds of individuals or 'polyps'



These beautiful jewel anemones come in a wide variety of colours and are able to withstand very rough seas.



Another species of sea anemone that is common in Tristan



A colony of soft coral polyps spreads its stinging tentacles to catch food



Molluscs

What do they look like?

Molluscs that live in the sea at Tristan include sea-snails and sea-slugs (also called nudibranchs), and the cleverest mollusc of all, the catfish or octopus, is also common here.

Where are they found?

Molluscs are found living close to their food on rocks and boulders. You can find sea snails, sea slugs and catfish in the rockpools at Runaway Beach.

How do they feed?

Some whelks (sea snails) are grazing animals, while others eat carrion (dead animals) or attack other sea creatures.

Sea slugs eat sponges, anemones or soft corals.

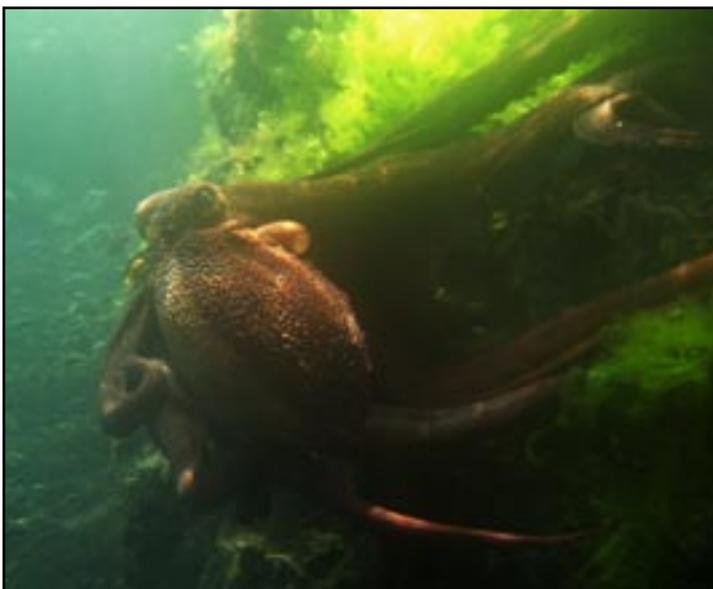
The octopus (or catfish) has powerful arms with suckers that can pin down its prey. It then kills it with a bite from its powerful beak (the only hard part in an octopus' body!) Its favourite food is crayfish.



The whelk's hard shell protects the soft body inside



A beautiful nudibranch seen in a rockpool at Runaway Beach



This massive octopus is safe from its natural enemies living here in the rockpools at Runaway Beach where it feeds on juvenile crayfish. You may get a fright when it grabs you by the leg!



The octopus is a master of disguise. Not only can it change its colour, it can also change the texture of its skin and will put out a smokescreen of black ink if it decides to make a run for it



Echinoderms (starfish and urchins)

What do they look like?

'Echinoderm' means 'spiny skin'. Both starfish and urchins have spiky skin and hundreds of tiny arms with suckers on the end called tube feet, which they use to hold on and move about.

Most echinoderms are 5-sided - there is no front or back!

Where are they found?

Most starfish and urchins live on rocks and boulders, close to where their food is found. You can see them in rockpools too.

How do they feed?

Starfish are predators that feed on smaller animals that are unable to move. They either seize them with their arms and put it on their mouth (its in the middle of the starfish on the underside) or turn their stomach inside-out and squirt digestive juice onto the prey, which is then sucked back the stomach. A starfish has 6 stomachs - one in the middle and one in each arm!

Urchins are grazers that eat anything and everything that grows on the rocks - this includes seaweed and sponges. They have a sort of beak underneath that rasps away at its food.



The commonest starfish in Tristan (Henricia sp)



The sea urchin Arbacia crassispina. The 5-sided body plan is plain to see.



An unusual cushion starfish, found only in deep water



These urchins have grazed the rock bare



Subantarctic Fur Seal

Tristan name Seal
Scientific name *Arctocephalus tropicalis*

What does it look like?

Grey body with paler face and underside
 Pointed snout with long whiskers
 Small ears on the side of the head
 Hind flippers can be used for walking
 Males are larger than females
 Clumsy on land but fast and graceful underwater

Where is it found?

This fur seal is found on all the Tristan islands, the majority on Gough. It also occurs on other oceanic islands at similar latitudes eg Prince Edward, Marion and Amsterdam Island.

What does it eat?

Mainly fish, squid and krill (shrimps). May also occasionally eat penguins.

What are the threats?

Were once hunted for their fur, but currently not threatened - most colonies are increasing in size. Its natural enemies include sharks and killer whales.

When does it breed?

Breeds on rocky coasts in large colonies from November to January. Males fight each other for the right to breed with several females.

Seal or fur seal?

True seals have their hind flippers so far back they can't walk on them - they just flop along on their bellies. Fur seals and sealions are able to use their hind flippers for walking.



The long whiskers and small ears are easy to see



Fur seals can walk (and run!) on their hind flippers



A female elephant seal at Caves Point. This is a true seal - it has no ear flaps and can't walk on its hind flippers. Once common, they were hunted for their oil to such an extent that they are now rarely seen.



Landscape

Building the islands

All the islands of the Tristan group are formed by volcanoes. These erupted from the ocean floor and gradually increased in size until they extended above sea level.

Layer upon layer

The volcanoes were not built up in one go. Every time the volcano erupted, it added another layer to the mountain.

Lava and ash

Some eruptions produced lava - molten rock which flowed down the mountainside- while at other times, it would eject clouds of ash and small stones instead. These different layers are often easy to see - the lava cooled into hard rock whereas the ash layers have turned into loose crumbly rock.



You can clearly see the layers where the mountainside has been cut away, such as the cliffs here at Pigbite.

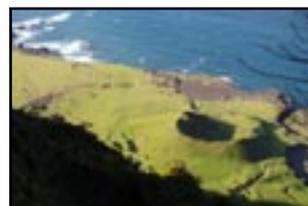
How did the Tristan islands get here? How old are they? Why are they the shape they are? The next two pages will help to explain.

Craters

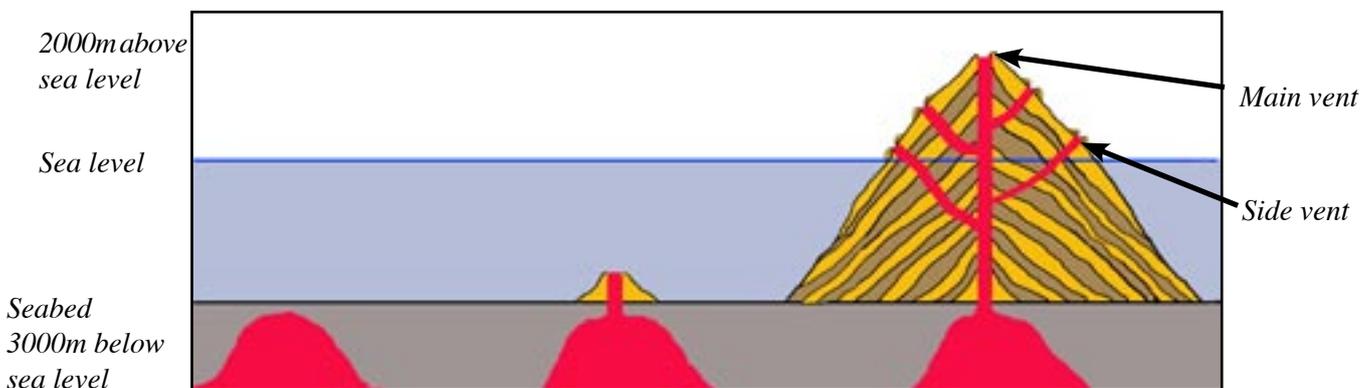
The main point for eruptions was at the centre of the volcano, which formed the crater at the summit. However eruptions also occurred from side vents at many other places around the edges of the mountain. The cratered hills created by these eruptions can be clearly seen at places such as The Ponds, The Hillpiece, Green Hill, Red Hill, and Frank's Hill. The 1961 eruption was the most recent of these; the previous eruption occurred at Stony Hill about 300 years ago.



The biggest crater is found at the summit



Smaller craters are found all over the island in places such as Hackel Hill (left) and the Ponds (right)



1. Hot molten rock rises from beneath the ocean floor
2. The hot rock breaks through to form an underwater seamount
3. Each eruption gradually increases the height of the volcano until it eventually becomes an island rising out of the sea.

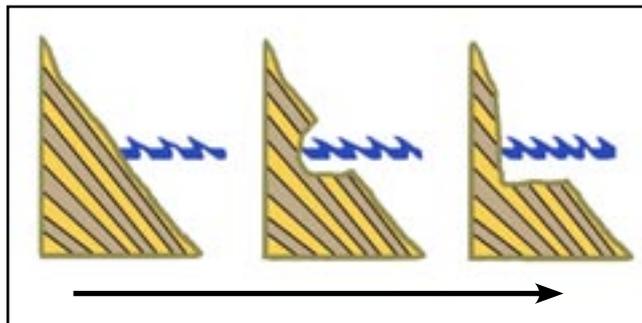


Erosion - knocking the islands down again

No sooner had the islands emerged from the sea, the sea and rain began to wear them down again. As the ocean batters the coast it undermines the relatively soft rock to create the huge cliffs seen around Tristan today. Rain falling on the mountain creates deep erosion gullies (gulches) that carry away the volcanic rock towards the sea.



Rain water flows down Tristan's gulches towards the sea, taking rocks and sand with it



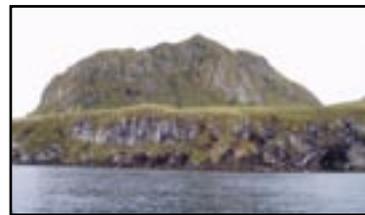
How cliffs form: the sea undermines the land until the rocks above it are no longer supported. They then fall into the sea, and the process starts all over again.



This gulch at Anchorstock once reached down to the sea but the cliffs have been eroded back leaving behind a 'hanging valley'

Rock of ages

The same thing has happened to the other, older islands. Tristan is only 200,000 years old whereas Inaccessible and Nightingale are much older. Inaccessible (2 to 3 million years old) used to be the same size as Tristan, but has worn down to its present size over that time. Nightingale is the oldest at 18 million years old. In this time it has lost all its softer outer layers leaving only the hard core behind.



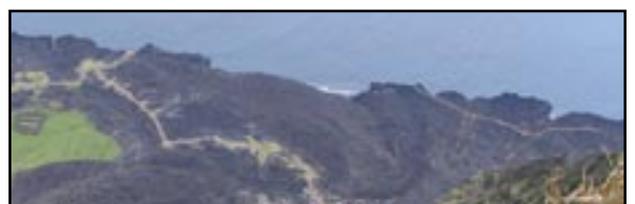
The hard rock of Nightingale is all that remains of a much bigger island that has been worn away over millions of years

Hard and soft rock

The slower the volcanic molten rock cools, the harder it becomes. Molten rock ejected as lava creates soft rock that is easily eroded (rock made from layers of ash is even softer). However, the rock that has cooled and solidified slowly, deep inside the volcano, has become much harder. In some places molten rock was squeezed through cracks inside the mountain and cooled slowly. This harder rock wears away more slowly than the surrounding layers and stands out in some places as rock walls or pinnacles.



Pinnacles made of harder rock are found at the top of Deep Gulch



The 1961 volcano is already being worn away by the sea - the first road built across it has nearly disappeared



Written and produced for St Mary's School by Paul Tyler and Alison Rothwell. All photographs by the authors except where indicated. This project was funded by the UK Overseas Territories Conservation Forum, with the generous support of the Bryan Guinness Charitable Trust. It is based largely on material collected with the assistance of the people of Tristan da Cunha during the course of the Darwin Initiative Project on biodiversity conservation in Tristan 2003 - 2005 .

