Connect Chagos: People and Wildlife
Welcome

The Connect Chagos team are proud to present this booklet to all members of the Chagossian Community. We have had the privilege of getting to know many of you over the past 4 years through the Connect Chagos Project and have shared great memories. We hope you find this booklet full of facts and information about the extraordinary environment of the Chagos Archipelago, as well as the environment around us here in the UK. If you find yourself with a deep interest in birds, the ocean or anything else covered in the following pages please look to the “links to more information” page or email us at chagos.community@zsl.org to get involved!

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The Connect Chagos Team

The Connect Chagos project was designed to engage the Chagossian community with the environment and its conservation. It’s been inspiring to see so many members of the community participate in events, attend training sessions and successfully graduate from an intense course, building on their inherent interest in and passion for nature. Many graduates have gone on to further their skills, run their own events, volunteer with local wildlife projects and become amazing ambassadors for the environment. I hope this booklet helps showcase the extraordinary environment of the Chagos Archipelago and helps support further conservation activities run by the Chagossian community for the community.

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Contents

1 - 2 The Connect Chagos Project

3 - 4 Introduction to Nature Conservation

5 - 10 Marine life & the Chagos Archipelago
  5 The Chagos Archipelago
  6 Coral reefs
  7 Life in the ocean
  8 Life on a coral reef
  9 Sharks
  10 Marine life in the UK

11 - 14 People and the ocean
  11 How do we use the ocean?
  12 Major threats to the ocean
  13 Fishing
  14 Marine Protected Areas

15 - 18 Climate Change
  17 - 18 Climate Change and the ocean

19 - 22 Birds
  19 Birds of the Chagos Archipelago
  20 Seabirds & Shorebirds
  21 UK garden birds
  22 Make your own bird feeder
Contents

23 - 26  Plants
   23  Plants of the Chagos Archipelago
   24  Coconut palms & their many uses
   25  Medicinal plants
   26  UK native trees

27 - 30  Habitat Management
   27 - 28  Managing an island habitat
   29 - 30  UK habitats & wildlife-friendly gardens

31- 32  Chagossian Culture

33 - 34  Quick Quiz Answers

35 - 36  Glossary

37 - 38  Links to more information

39 - 44  Connect Chagos Photo Gallery

45  Trainee experiences

46  Thanks to our funders
What is the Connect Chagos project?

The Connect Chagos project was created in 2012 to engage with Chagossian communities, initially with those based in the UK, in order to increase environmental awareness and to contribute practically to the conservation of the Chagos Archipelago.

Engaging with the community

In the UK...

Staff from the Connect Chagos project, based at the Zoological Society of London (ZSL), work with Chagossian communities in Crawley and Manchester. Events such as Environmental Open Days provided opportunities to talk about the unique environment of the Chagos Archipelago and its conservation. These days also provided the chance to raise awareness of the Environmental Training Course which runs over the summer. Tailored sessions throughout the year delivered nature-focused workshops on a variety of topics to the community. The Connect Chagos project aims to continue building relationships with the community and offers additional opportunities for graduates who have successfully completed the training course.

... and overseas

In April 2014 the Connect Chagos team visited Mauritius to scope out interest for expanding the project to incorporate their Chagossian communities. In the future, the intent is to build an environmental training course and associated opportunities to Chagossian communities outside of the UK.
Connect Chagos
Environmental Training Course

For four summers, an Environmental Training Course has been run by ZSL along with a variety of conservation organisations. Members of the Chagossian communities in Crawley and Manchester have been invited to attend and participate in 10 training sessions run on a range of nature-related topics relevant to Chagos. These include bird monitoring, habitat management, climate change and marine ecology and conservation. The training course finishes with a team building “wild weekend” away and an award ceremony that recognises the hard work and achievements of the graduates.

Tailored Sessions

In 2014 ZSL launched “Tailored Sessions” as a new outreach opportunity. These sessions provided inclusive environmental learning throughout the year within the UK-based Chagossian communities and created new opportunities for those unable to commit to the full summer training course. Workshops alternated between Crawley and Manchester and introduced participants to conservation inspired activities such as pond dipping and habitat management and provided a good opportunity for the community to get together, have fun and gain environmental skills.

Advanced Training

Any trainee, or ambassador, who successfully graduated from the Connect Chagos Environmental Training Course has the opportunity to apply for an advanced training bursary. The bursary provides funds to an individual or small group to help them continue training in a particular area of environmental conservation. Trainees are encouraged to develop and build on their new interests discovered during the training course and be proactive in finding opportunities for continued development. Over the last four years bursaries have been used to provide ambassadors with SCUBA diving and chainsaw qualifications, take swimming lessons and organise conservation focused community events. All ambassadors have the opportunity to apply for a place on scientific expeditions to the Chagos Archipelago where further training opportunities are provided and their skills are applied in the field.
Connect Chagos: An Introduction to Nature Conservation

This booklet summarises information from the topics covered during the Connect Chagos Environmental Training Course, from plants and animals to fishing and culture. For those of you who have taken part in the training course hopefully this will refresh your minds on what you already know! For everyone else, this booklet is a great resource to learn about the incredible environment of the Chagos Islands, as well as touching on the environment surrounding us here in the UK, how we are affecting it and what we can do to help.

But before we begin, lets first get to grips with the basics.

What is a species?

A group of living things which are able to breed and produce offspring which are also able to breed. For example; a spider monkey, a tiger or us—humans!
What is nature?

Nature is a term generally used to refer to all living things, including plants and animals of all shapes, sizes and colours.

What is nature conservation?

“Securing a long-term future for species in their natural habitats”

Conservationists work hard to look after the natural world, restore areas which may have been damaged by human activities and ensure they survive and flourish for many years to come. “Marine conservation” is looking after the natural world found under the waves of the ocean.

What is a habitat?

A natural home of living things like animals and plants. Habitats can be huge or very tiny! From “the ocean” to a forest, to a small pond.

What is biodiversity?

Biodiversity is the variety, or number of different plants and animals in a habitat. For example, coral reefs are some of the most biodiverse habitats on the planet!
The Chagos Archipelago

2,200km north east of Mauritius, the Chagos Archipelago - also known as the British Indian Ocean Territory (BIOT) - consists of 55 small islands in the Indian Ocean surrounded by vibrant coral reefs, incredible marine life and the clearest water in the world!

More than 220 different species of coral make up the reefs of the Chagos Archipelago. Over thousands of years these reefs have played an important part in its formation through the build-up and break down of their fragile limestone skeletons.

The reefs and islands support an abundance of wildlife including breeding colonies of 17 species of sea bird, 280 species of flowering plant and ferns and over 780 species of fish - including the Chagos clownfish (*Amphiprion chagosensis*), a species found nowhere else on Earth!

What are corals?

Believe it or not, corals are *animals* not rocks or plants and are closely related to jellyfish! Picture a jellyfish drifting in the ocean, its simple body with long flowing tentacles surrounding a mouth. Turn it upside down and you have a coral polyp. Corals come in hundreds of different shapes, sizes and colours. The polyps of hard, or reef building corals, sit within a cup that it has made out of calcium carbonate (limestone). This substance is produced very slowly and eventually sticks to that made by neighbouring polyps to create a large coral colony, and eventually a whole reef. Given enough time reefs can get so big they can be seen from space - just like the Great Barrier Reef in Australia.
What do corals eat?

Corals have two different ways of feeding. They can get up to 95% of their food with the help of algae (tiny plants) called *zooxanthellae* which live within each coral polyp. They soak up sunlight shining through the water and use photosynthesis to create energy for the corals.

When the sun isn’t shining, corals can still feed by catching and eating plankton (more tiny plants) floating in the water column by sticking out their stinging tentacles. When a coral colony is feeding this way you can think of it like a tall block of flats with people leaning out of each window, holding their arms out to catch food passing by.

How do coral reefs form?

Coral reefs form when free-swimming coral polyps attach to submerged rocks along the edges of islands or continents. As the corals grow and produce calcium carbonate the reef takes on one of three types of formations - a fringing reef, a barrier reef, or an atoll.

![Reef Diagram]

**Fringing Reefs**
These are the most common and can be found right off the beach along the coast and around the edges of islands.

**Barrier Reefs**
These also border the coast but are much further off shore, creating a lagoon in between the reef and the islands or mainland.

**Atolls**
Atolls are usually circular with a central lagoon, small islands may appear with gaps created by the ocean to allow access into the lagoon.

All three types of reef can be split into several different zones which vary with depth of the water, wave action, current strength, temperature and light which all act to create characteristic zones of corals, algae and other species. As you travel across the reef moving from the shore towards the deep water, zones created include the reef flat, reef crest, and the reef wall.

The **reef flat** is very sheltered and can be a few centimetres to a few metres deep, with large areas being exposed out of the water at low tide. The **reef crest** is the highest point and is exposed to the full force of the ocean’s waves. The **reef wall** can drop off into deep water very quickly losing light even quicker.

Credit: CORIS/NOAA
Where do corals fit in?

Corals play a vital role of bringing energy from the sun into the ocean. Like plants, the zooxanthellae photosynthesize, creating food for the coral. Therefore they sit at the bottom of the food web.

Life in the ocean

Life in the ocean can be a lot more complicated than life on land. For land-based, or terrestrial animals, we refer to the order of who eats who as a “food chain”. For example, a zebra grazes on grass which gets its energy from the sun, and a lion eats the zebra. We refer to the flow of life in the ocean as a “food web” as the largest animals can feed on some of the smallest, skipping several steps. For example, a blue whale (the largest animal on earth!) feeds on tiny shrimp-like creatures known as krill.

Where can coral reefs be found?

Coral needs certain conditions in order to grow, when the conditions are just right, beautiful coral reefs flourish. They are typically found around the tropics - between the Tropic of Cancer in the northern hemisphere and the Tropic of Capricorn in the southern hemisphere.

Warm water

The temperature of the ocean needs to be just right, between 23°C—29°C, although there are exceptions around the world where temperatures can dip as low at 18°C or reach as high as 37°C!

Clear water

The zooxanthellae (algae) within the coral polyps need light from the sun in order to photosynthesise and produce food for the coral. This is why coral reefs are rarely found near estuaries - where rivers meet the ocean - as the water can be very murky. In the clearest of oceans light can shine through the water right down to a depth of 100m!

Nutrients and pH

Corals also require nutrients to be present in the water and for the pH to be just right. If the water is too acidic, too hot or too murky the zooxanthellae can be pushed out of the coral polyps which can lead to coral bleaching (more about this later) and the reef itself dying.

Credit: Worldoceanreview.com
Why are the coral reefs of Chagos famous?

The Chagos Archipelago is full of sea birds and home to the world’s largest crab - the Coconut crab. However it’s incredibly heathy coral reefs and it’s biodiversity - or number of different animals - under the waves are truly impressive. Chagos is also unique in its location, placed in the middle of the Indian Ocean, thousands of miles away from large cities full of people and pollution. Therefore it is one of the most pristine, and healthiest coral reefs in the world!

Life on a coral reef

A coral reef is not just home to corals, the 3D reef structure that corals create provides homes for a huge variety of marine life. Coral reefs only cover 0.1% of the ocean, yet support 25% of all marine life, with thousands of species relying on the reef for all or part of their life. Every animal that calls the reef home has its own niche, or role to play. Tiny fish and shrimp such as wrasse and cleaner shrimp provide a cleaning service for larger animals like turtles and large groupers. Invertebrates (animals without a backbone) like colourful marine worms live amongst the cracks and crevices of the coral colonies. Hundreds of species of colourful fish patrol their patch of the reef and large predators like sharks scour the outer reef for an easy meal.

Life in the ocean... sea cucumbers to sharks!

Sea cucumbers

Many people swimming over a coral reef wouldn’t give a second glance to what looks like a soggy sausage sitting on the sand. But if you were to stop, look and learn a little about sea cucumbers you would find they’re very useful animals! There are over 1,250 different species of sea cucumber, which are also known as the “vacuum cleaners of the ocean”.

Around their mouth is a ring of tentacles which are used to shovel sand into their mouths. They feed on algae growing on the sand particles before they push the cleaned sand back out of their mouths. In the south Pacific sea cucumbers can be found in such numbers they are able to process 19kg of sand per square metre! To breathe sea cucumbers take in seawater and remove the oxygen from it before “breathing” it out.
Sharks

Sharks have been swimming in the world’s oceans for over 400 million years - a long time before the dinosaurs and they have evolved to become incredible predators and sit proudly at the top of the food web. There are over 500 different species of shark, from the biggest fish in the ocean - the harmless whale shark, to the funny looking goblin shark which can be found in the deep sea. Most shark species have roughly the same shaped body, intricately designed to propel them through the water with ease.

Be shark-wise!
You might not think it, but only a few sharks are potentially dangerous to humans. If we look at the facts, we are much more likely to lose our life by being struck by lightning, falling off a chair or whilst taking a selfie! However, over many years the sensationalist media has portrayed sharks as mindless killing machines which should be feared. In reality sharks should be much more scared of humans. Over 100 million sharks are killed every year, the majority have their fins removed which are sent across Asia and made into shark fin soup.

Shark Fact vs Shark Fiction!

All sharks are out to get you.
FALSE
Some species never get bigger than the length of your arm, some don’t even have true teeth. Only 11 species, out of more than 500, have been responsible for injuries to humans.

You’re more likely to be bitten by a shark than injured falling off a chair.
FALSE
You are much more likely to be killed by a long list of household items… chairs and toasters cause 650 deaths a year!

Sharks have a 6th sense.
TRUE
Sharks can detect electrical impulses in the water through tiny pits around their nose called “Ampullae of Lorenzini”. These jelly-filled holes have tiny nerve hairs within them which detect heartbeats and movement of the shark’s prey.
Marine life in the UK – the rocky shore

If you went down to the beach today and rummaged around in the rockpools at low tide, you would be amazed at the incredible creatures you would find! However, a rocky shore is a tough place to live and any animal calling this habitat home has to cope with a long list of challenges. The first is the tide as twice a day, everyday, they will be exposed to the elements as the water retreats. On a hot summer's day any soft-bodied animal could easily dry out or overheat. Below are some of the animals you may be lucky enough to encounter...

**Barnacles**
Cemented to the rocks you may find thousands of tiny barnacles. In relation to body size, these tiny animals have the largest penis of any animal in the world!

**Limpets**
These are very commonly found on the rocky shore. These conical shaped molluscs (animals with a hard shell) move very slowly across the rocks, feeding on algae by scraping it off the rocks with a sharp arm known as a radula.

**Mussels**
Another common find are mussels. These bivalve molluscs (meaning they have two halves to their shell) are filter feeders, opening up at high tide to feed on the nutrients in the sea water.

**Anemones**
If you're willing to get your hands wet in the rock pools then look our for anemones! When the tide is out these jellyfish-like animals will often have their tentacles pulled in, appearing like squishy red blobs stuck to the underside of rocks.

**Starfish**
The most common species is, rather unsurprisingly, known as the common starfish. These amazing animals need to be submerged in water, so if you do find one make sure it is put back into a good sized rock pool.

**Crabs**
The two main species of crab you are likely to encounter are the shore crab and the edible crab (right). To tell them apart have a look around the edges of their shells. The Edible crab as a crimped edge and looks almost like a pasty!

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**Quick Quiz 1!**

1. **Where in the oceans can we find coral reefs?**

2. **Why are the coral reefs of the Chagos Archipelago so special?**

3. **Why do we refer to a “food web” in the ocean and a “food chain” on land?**

4. **What percentage (%) of marine life are coral reefs home to?**

5. **Are you more likely to be bitten by a shark or injured falling off a chair?**

   (Answers on pages 35-36)
People and the ocean

Why is the ocean important?

With the ocean covering 72% of the Earth’s surface we truly are a “blue planet” and even if we don’t live near it, our lives are still dependent on the ocean in many ways. The ocean produces more than half of our oxygen and absorbs over a third of the carbon dioxide we produce. It also plays a key role in the regulation of our climate and can dictate weather patterns that head our way.

How do we use the ocean?

- 2.6 billion people rely on fish from the ocean as their primary source of protein.
- Commercial fisheries and the jobs associated with it employ over 200 million people around the world.
- Coral reefs attract tourists from all around the world and bring in an estimated $9.6 billion US dollars in revenue!
- Millions of people head to the beach every year for their holidays, enjoying water sports and swimming in the ocean.
- The ocean holds cures for many human ailments. The sea hare (pictured) has been used in research on dementia due to its simple brain and ability to learn.
- We rely on coral reefs for protection against large storms. Huge waves crash onto the reef and lose much of their energy before reaching the coast and people’s homes.
- Thousands of huge containerships and tankers are constantly moving billions of tons of goods around the world on key trade routes.
- We don’t just extract fish from the oceans. We also take coral itself to build homes with, and sand to replenish our shrinking beaches.
- 2.6 billion people rely on fish from the ocean as their primary source of protein.
Globally the ocean is in trouble. We are taking out too many fish and throwing in millions of tons of rubbish and pollution. Areas once rich in marine life are being heavily exploited and destroyed. Commercial fishing is reducing fish populations at an alarming rate, shark finning is big business and nowhere, not even Chagos, is safe from the impacts of climate change!

### Major threats to the ocean

#### Coastal Development

60% of the world’s population live within 60km of the sea. Many of the world’s natural coastlines have been developed into major ports for ships, or have been lined with hotels, all competing for an ocean view.

#### Pollution: Micro-plastics

If you use an exfoliating face wash or certain toothpastes, you may be sending thousands of tiny pieces of plastic into the ocean each day without realising! A single bottle can contain over 300,000 microbeads! Far too small to be stopped by the filters at sewage treatment plants, these plastics are eaten by fish and other marine life and make their way up the food chain, eventually killing the animals which have eaten them. However, there are alternatives, some facial scrubs use natural exfoliates like crushed apricot seeds.

#### Pollution: Chemical

Chemical pollution often goes unnoticed and is rarely reported. 44% comes into the ocean from rivers and 33% is absorbed by the ocean from the air. It is a big problem around large coastal cities. Such chemicals can cause health issues to marine animals including tumours on turtles.

#### Pollution: Plastics

We throw 6.4 million tons of plastic rubbish into the ocean every single year. Plastic can now be found in the deep sea, in Arctic Sea ice and even in the tiny polyps of corals.

### What can we do to help?

- **Reduce, Reuse and Recycle!**
  Do you need to buy potatoes in a plastic tray, wrapped in plastic and put into a plastic bag? Why not try to avoid plastic altogether!

- **Spread the word!**
  Tell your friends and family about the things you have learnt.

- **Lead by example!**
  Practise what you preach and others will follow!
Threats to the ocean... fishing.

Fishing is arguably THE most destructive activity we are doing to our oceans (right), with climate change in second place (more about this later!). 70% of all commercial fish species are thought to be exploited or severely depleted - in other words, we have taken too many fish from the sea so quickly that they cannot naturally replace themselves. As well as taking too much, we are also fishing in ways which damage many other forms of marine life that weren’t targeted by the fishermen and are known as bycatch.

Destructive fishing methods:

**Trawling**

Trawling involves a net being dragged behind a fishing boat. It can be dragged along the sea bed (like a farmer ploughing a field) or through the water column. Trawlers can be big, *very big!* Super trawlers can be 144m long and catch 250 tons of fish each day! The nets dragged behind super trawlers can hold 13 Jumbo Jets!

**Longlining**

A very long fishing line (up to a mile long!) with thousands of baited hooks is set from the back of a boat. Fishermen target large pelagic (ocean dwelling) fish such as tuna & marlin. The lines can be left for weeks and unfortunately any animal which bites down on the hook is stuck there. Leatherback turtles are accidentally caught and sharks can even be targeted by fishermen for their fins.

**Illegal Fishing**

It is incredibly difficult to track where the fish on your plate has come from. If a fish has been taken from the ocean by an illegal fishing boat it is common for it to be passed to a legal boat before it is landed and sold on.

The truth about IUU fishing is we just don’t know how much of an issue it is as facts and figures are rare and unreliable. Old, illegal fishing boats are often home to many workers kept in slave-like conditions for months at a time.

**Bycatch**

Bycatch is everything caught in a fishing net which the fishermen wasn’t after. From dolphins, whales, turtles and sea birds, to small fish, crabs and starfish. The tuna fishery often finds dolphins caught in their nets. One way to avoid this is to change their fishing method - using poles and lines rather than large nets stops dolphins being caught.

*When buying tuna at the supermarket, look out for “caught by pole and line# on the can!*

**Buy sustainable seafood!**

When buying sustainable seafood you are making a choice to purchase fish that has been caught or farmed in ways that consider the long term health impacts on marine life. Look for the Marine Stewardship Council logo (left) on packaging or get your hands on a “Good Fish Guide” from the Marine Conservation Society (www.fishonline.com) (right) that tells you which fish are the right fish to eat!
Marine Protected Areas

So how do we make sure we protect the ocean for future generations?

One way is to create Marine Protected Areas (MPAs), a simple, yet effective way of reducing or stopping destructive fishing activities and allowing marine ecosystems to recover. The level of protection can vary, from stopping certain fishing methods, to fully protected “no take” zones where nothing can be taken and only certain recreational activities can happen.

Given enough time, life within the ecosystem will begin to recover and eventually fish and other marine animals will spill out over the boundary of the MPA allowing local fishermen to reap the rewards of a good, yet sustainable catch.

In 2010 the territorial waters around the Chagos Archipelago, totalling 640,000km², were declared an MPA, making it the world’s largest no-take zone! (see map on page 5). An area of ocean more than twice the size of the UK is now protected from all destructive activities and a refuge for all marine life including corals, fish, sharks, turtles, dolphins and seabirds has been created.

The map above shows MPAs around the world (in blue) and terrestrial protected areas (in green). Currently MPAs are lagging behind with only 3.4% of the oceans under some level of protection versus 14% of land! However, things are changing! In 2015 the UK Government announced their intention to make the waters around the Pitcairn Islands (a UK overseas territory in the Pacific) a MPA.

Quick Quiz 2!

1. How is the ocean important to you?
2. What can we do to reduce the amount of rubbish that ends up in the ocean?
3. What is longlining?
4. How can the fish we eat help ensure there is enough fish for the future?
5. What is a Marine Protected Area?

(Answers on pages 35-36)
Climate Change

What is Climate Change and what is Global Warming?
These two terms are often used as if they are same thing, however, they are very different!

**Global Warming:** means the temperature of the earth is increasing.

**Climate Change:** is changes in the earth’s weather patterns.

The Greenhouse Effect

In order to understand Climate Change better, let’s first get to know a bit about the Greenhouse Effect.

Around the Earth we have the atmosphere, which is made up of lots of different gases - known as Greenhouse Gases - including water vapour, carbon dioxide, methane, and nitrous oxide. These are the gases that help keep the Earth warm. As the Sun’s heat reaches the Earth, some heat is absorbed by the oceans and the land and the rest bounces back into the atmosphere trapping some of the heat - this process is known as the Greenhouse Effect. If we didn’t have the atmosphere the Earth would be freezing cold as all of the heat from the Sun would be lost.

Global Warming

If we add more Greenhouse Gases, by burning fossil fuels for example, we make the atmosphere much better at trapping heat, and therefore the temperature begins to rise - resulting in Global Warming!

The Science bit...

Scientists have proven that the average surface air temperature of the Earth is increasing and has risen by 0.8°C since 1900. However, a common question put to scientists is “If the world is warming, why is winter still very cold?” From looking at the graph on the left you may notice the temperature doesn’t increase every year (the red line), and we still have very cold winters. To see a trend in the data we need to look at a much bigger picture—over hundreds to thousands of years, then we see a steady increase (the black line).

What’s the deal with Carbon Dioxide?

Carbon Dioxide (or CO₂) is a Greenhouse Gas naturally present in the atmosphere and comes from both natural and human sources. Humans create CO₂ by burning fossil fuels, driving cars and flying in planes. Levels have increased 40% since the industrial revolution (1780—1850) and we now emit 24 million tones per day! Increases in CO₂ are the single largest contributor to Global Warming. Scientists have proven the link between CO₂ and the Earth’s temperature (graph on the right) by looking back 800,000 years!
The effects on our climate

So we now know the Earth is getting hotter... does that mean the UK will soon turn into a tropical paradise?!

Unfortunately not! We are predicted a temperature rise between 2.4°C to 4.8°C by the end of the century but the atmosphere is also becoming full of moisture. This gives more energy to storms and increases the likelihood of us experiencing many more extreme weather events. Conditions won’t change at the same rate all over the world. Some areas will become much wetter and stormier while others will experience severe heat waves and droughts. Researchers have already found extreme heatwaves previously recorded once every three years are now happening every 200 days!

Rising sea levels

As the Earth warms up the glaciers and thick ice covering Greenland and Antarctica is melting. When water warms, it expands causing sea levels to rise. We are already seeing a rise of 3.2mm each year and scientists believe there is potential for the average sea level to rise by up to 1 metre by 2100! This would have disastrous effects on low-lying countries like Bangladesh (and also including parts of the UK) as well as causing flooding in many of the major cities of the world. The map to the left shows the areas of land which would be flooded if sea levels rose by 170m!

Climate change facts!

- The hottest ever July day in the UK was recorded at Heathrow Airport on 1st July 2015 at a scorching 37.4°C.
- In 2012 the Arctic sea ice shrunk to its lowest ever levels.
- Any given place on Earth will experience 60% more extreme rain events and 27 more extremely hot days.
- 2014 was the world’s hottest year since records began and the 38th year in a row with above average global temperatures!

Source: Science
Climate Change & the ocean

Climate Change is affecting the ocean in three major ways:
1. Ocean Acidification (OA)
2. Hotter oceans
3. Sea level rise

1. Ocean Acidification

The ocean naturally absorbs about a third of all CO$_2$ in the atmosphere, however, with increasing amounts being pumped out, more is being absorbed into the ocean. So much in fact, that it is causing the pH (the alkaline/acidity scale, left) of the ocean to drop. The ocean’s pH is naturally 8.2 (slightly alkaline), however, it has already dropped to 8.1 in the past few decades and scientists believe it could drop even further - as low as 7.8 by 2100.

**Effects on marine life**

OA is already starting to affect those marine animals who produce their own shell or hard skeleton like crabs, snails and even corals. These animals undergo a complex process in order to create the calcium carbonate needed to make their shells. OA slows down, and can even stop this process. Their shells become much thinner and weaker, putting them at greater risk of predation.

2. Hotter Oceans

There is huge variation in the temperature of the world’s oceans, for example the average temperature of the Indian Ocean is 28°C, compared to 2°C in the Arctic Ocean. However, those temperatures stay relatively stable. Therefore marine animals, especially corals, aren’t used to dramatic changes in temperature.

**Effects on corals**

Remember zooxanthellae? The algae that lives within coral polyps? They don’t like change! Certain species can just about cope with short periods of higher water temperatures, but if this persists they will leave. Zooxanthellae also provide colour to the coral, so once they have gone the coral appears white - this is also know as **coral bleaching** (left). This can result in the death of the coral if temperatures don’t return to normal quickly. We can expect to see many more disastrous bleaching events as the oceans get warmer.
3. Rising sea levels: effects on marine life

Corals like to live at a certain depth where light from the sun can shine down into the clear water. The deeper they are, the less light can reach them. Most coral reefs adapt to natural fluctuations, but if sea levels rise too quickly the reef can’t grow quick enough to keep up!

Marine animals at risk

Polar bears are the symbol for Climate Change as they are likely to be one of the worst affected animals. They depend on the Arctic sea ice, which forms each year, using it as a floating platform to catch their prey. Experts believe the ice is melting at 9% per decade, endangering the polar bear’s habitat.

Female turtles come onto land to dig nests and lay their eggs. With sea levels rising beaches will start to shrink and turtles will have less space to nest. Turtles are classed as reptiles, a characteristic of which is that temperature decides which sex the babies (hatchlings) will be. A higher temperature results in females, while a slightly lower temperature results in males. With the Earth slowly heating up we are likely to see many more female turtles than males in the future.

*Chagos update*

Chagos’ reefs are some of the most remote on earth, therefore the effects of Climate Change are as low as they can be in the absence of other pressures. However, even Chagos is not immune.

Set up around the 55 islands are temperature loggers which have been recording water temperature every 2 hours since 2006. Data have already shown an increase in water temperature of 0.3°C. The average surface temperature of the waters around Chagos is 29.5°C, this year (2015) temperature has hit 31°C! As with many coral reefs around the world 2015 is set to be a year of catastrophic coral bleaching due to the unusually warm waters caused by a strong El Nino event.

Quick Quiz 3!

1. What is the difference between climate change and global warming?

2. By what percentage have carbon dioxide levels increased since the Industrial Revolution?

3. If the Earth is getting hotter, why isn’t the UK going to turn into a tropical paradise?

4. What affect is ocean acidification going to have on crabs?

(Answers on pages 35-36)
Birds of the Chagos Archipelago

An estimated 50 different species of birds have been recorded throughout the Chagos archipelago including land-based birds as well as many species of seabird. Here we will learn about some key species as well as what birds we can see in our UK gardens and how we can help keep them well fed and healthy!

**Introduce birds**

Due to its remote location, it is unlikely that Chagos was ever home to a native land-bird community. When the islands were first colonised by people, a number of birds were introduced as a food source such as the Madagascan Turtle-dove and the Red Jungle Fowl (a feral chicken, left). Those species that flourished now form the bulk of the recorded land–birds throughout the islands and are especially prominent on Diego Garcia due to the human presence.

**Top 3 Chagos Birds**

**Red-footed Booby**

*Latin name: Sula sula*

*Colouration:* Adults are mainly white with iconic bright red feet.

*Breeding:* Adults have no breeding season and can be seen with young throughout the year.

*Numbers & Distribution:* Can be found across the Archipelago. In May 2005 4,370 breeding pairs were counted.

*Diet:* Feeds on small fish caught by diving into the ocean from a great height.

**Greater Frigatebird**

*Latin name: Fregata minor*

*Colouration:* Adult males are all black with grey/white colouration on their chin and breast.

*Breeding:* This species breed continuously throughout the year.

*Numbers & Distribution:* Over 300+ breeding pairs, the number varies on different islands.

*Diet:* Mainly fish stolen from other seabirds, chasing them until they regurgitate their stomach contents.

**Common White Tern**

*Latin name: Gygis alba*

*Colouration:* All white, with large dark eyes and a dark grey beak.

*Breeding:* The breeding population in Chagos is estimated at 610 pairs.

*Numbers & Distribution:* Majority nest on Diego Garcia, favouring ironwood trees.

*Diet:* Adults fly offshore to feed on schools of small fish.
Seabirds & Shorebirds

Seabirds
The Chagos archipelago supports around 180,000 pairs of at least 17 different species of seabird, with another 16 species having been sighted. As the islands are so remote, they are a globally important site for seabirds crossing the Indian Ocean, providing them with somewhere to rest and breed. The iconic bird of the islands is the red-footed booby (left), with its large bright red webbed feet.

Shorebirds
Due to its remote location there are very few land-based birds such as ducks, geese or waders on the islands.

Seabirds vs Shorebirds

- Countershading: light on their bellies, dark on the top.
- More feathers than other birds for insulation & water proofing.
- Specialised gland to excrete excess salt from drinking salt water.
- Flexible webbed feet for swimming.
- Long beak for poking their beaks in the sand for food.
- Usually have good camouflage.
- Long legs and thin toes.
- Found around freshwater and salt water, on every continent except for Antarctica.
### How well do you know your UK garden birds?

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Match the description to the bird!</strong></td>
</tr>
<tr>
<td>2.</td>
<td><strong>B. House Sparrow</strong>&lt;br&gt;House sparrows are noisy and often fly around together in small flocks. Males have a grey crown, black bib, reddish-brown back streaked with black, and grey breast and belly, while females have brown, streaky backs and are buff below.</td>
</tr>
<tr>
<td>3.</td>
<td><strong>D. Magpie</strong>&lt;br&gt;With its noisy chattering, black-and-white plumage and long tail, there is nothing else quite like the magpie in the UK. When seen close-up its black plumage takes on an altogether more colourful hue with a purplish-blue iridescent sheen to the wing feathers, and a green gloss to the tail.</td>
</tr>
<tr>
<td>4.</td>
<td><strong>F. Wood Pigeon</strong>&lt;br&gt;Woodpigeons are our largest pigeon. They have small, round, grey heads, white neck patches, a pink breast, and greyish bodies. You've probably heard its cooing call, and the loud clatter of its wings when it flies away.</td>
</tr>
<tr>
<td>5.</td>
<td><strong>G. Bullfinch</strong>&lt;br&gt;The male is unmistakable with his bright pinkish-red breast and cheeks, grey back, black cap and tail, and bright white rump.</td>
</tr>
<tr>
<td>6.</td>
<td><strong>E. Greenfinch</strong>&lt;br&gt;With its twittering and wheezing song, and flash of yellow and green as it flies, greenfinches are truly colourful characters. Females might be brown, but don't confuse them with female house sparrows - when she flies off, you'll see the yellow in her tail and wings.</td>
</tr>
<tr>
<td>7.</td>
<td><strong>A. Collared Dove</strong>&lt;br&gt;Collared doves are distinctive looking birds with buffy-pink plumage, a black neck collar and long, white tail with a black base. Their monotonous cooing will be a familiar sound to many of you. Although you'll often see them on their own or in pairs, flocks may form where there is a lot of food available.</td>
</tr>
<tr>
<td>8.</td>
<td><strong>C. Starling</strong>&lt;br&gt;Starlings are noisy characters that from a distance look black, but close up you can see they have green and purple glossy feathers, covered in white and buff spots. In winter, starlings from northern Europe join our own birds, and together form huge flocks.</td>
</tr>
<tr>
<td>9.</td>
<td><strong>H. Blue tit</strong>&lt;br&gt;A colourful mix of blue, yellow, white and green make the agile blue tit one of our most attractive garden visitors.</td>
</tr>
</tbody>
</table>

**Your answers:**

1.  
2.  
3.  
4.  
5.  
6.  
7.  
8.  
9.  

**Answers on page 36.**
Make your own bird feeder….

What will I need?

- 2 large plastic bottles
- 2 sticks, 25cm long
- String
- Scissors
- Bird seed

What do I do?

1. Cut off the bottom of 1 bottle - we will use it as a lid.
2. Punch a hole straight through the bottle—to attach the string handle.
3. Cut off the top of bottle 2
4. Cut out a door for the birds to reach the food.
5. Punch 4 holes through the bottom.
6. Remove the cap from bottle 1 and insert it into bottle 2, tip first. Make sure the tip of bottle 1 is below the bottom of the door.
7. Attach your string handle.
8. Push the sticks through the holes—for the birds to perch on.
9. Fill with bird seed!

Quick Quiz 4!

1. How many species of bird have been recorded in the Chagos islands?
2. Why are the islands so important for birds?
3. Name three differences between seabirds and shorebirds.
4. I’m a bird with a bright red chest, what am I?
5. Why should we provide food for our garden birds?

(Answers on pages 35-36)
Plants of the Chagos Islands

When we think of tropical islands we imagine white sand beaches boarded with tall palm trees. However, the native trees of the Chagos archipelago are large hardwood trees whose roots hold the ground together and whose branches provide ideal habitat for nesting birds.

Coconut plantations

It is not known whether humans first brought coconuts to the islands or whether they were carried by ocean currents and washed up on the beaches. We do know that in the 1800s many islands were cleared of their natural hard wood trees and vegetation to make way for orderly rows of coconut trees, grown mainly for their oil.

Almost all of the islands are covered with coconuts, and left to grow wild, these dense areas of vegetation have caused “coconut chaos” and real problems for the natural environment. Coconut palms drink a lot of water, their large palm leaves, or fronds, stop sunlight reaching smaller plants below and they have no suitable branches for birds to nest in – leading to a severe drop in seabird numbers on some islands.

In order to enable the ecosystem to return to its natural state, and to encourage growth of native vegetation the dominating coconut palm will need to be addressed.
Coconut Palms — so much more than just a tree!

**Coconut palm fronds:** leaves were woven together by the women to make hats, decorations, baskets and to cover the roofs of their houses.

**Coconut shell:** used in a fire as charcoal, to make bowls, cups and decorations.

**Coconut oil:** oil from the coconut flesh was used to treat many aches and illnesses. For example, to treat toothache oil would be boiled within the shell cup and applied to the mouth.

**Coconut tree trunk:** an alcoholic drink called Kalou was made from the sap collected by tapping into the palm trunk. The fresh palm juice is sweet, clear and colourless.

**Coconut husk:** used as a fire starters, also weaved together to make ropes and makeshift washing lines.

**Coconut flesh:** once grated, the flesh was squeezed to release its moisture. It was used as a key ingredient in meals including curries and cakes.

**Coconut milk:** this was drunk directly as well as used within cooking. More milk could be created by adding water to grated coconut flesh and squeezing out the excess moisture.
Living on such a remote group of islands where medical care was thousands of miles away, Chagossians historically used plants to treat medical conditions when people fell ill. Certain plant species are still used today by many cultures instead of standard medicines. Below are a few examples of those used in Mauritius and the Seychelles by Chagossian communities.

Known as “Saponer” in Mauritius or “Roz amer” in the Seychelles *Catharanthus roseus* (its scientific name) is widely used to treat a variety of ailments including dengue fever, diarrhoea and diabetes. This “bitter rose” is also known as the Madagascan periwinkle and comes in both white and pink coloured flowers.

The Indian nettle, also known as Lerb chat, has been used to help with a cough, upset stomach, itchy skin and spots. It was added to boiled water to drink, or crushed and brushed over spots.

Lemon grass (*Cymbopogon citratus*) has been used to treat a fever, with people known to have bathed in water infused with it, or add it with ginger, lemon and honey as a hot drink.

Other top plants...

Catnip, known for making cats deliriously crazy, has health properties which are great for humans too! It is known to relieve symptoms of a cold and is useful in breaking a fever as it promotes sweating.

Sage is an incredibly useful herb, known for its anti-inflammatory and anti-oxidant properties. Its great reputation is even represented in its scientific name, *Salvia officinalis*, derived from the Latin word, *salvere*, which means ‘to be saved’.

Around the world roughly 50,000 (1 in 6) species of plants have been used to treat medical conditions. Many are only used in folk medicine but around 100 species have contributed significantly to modern drugs.
Top UK native trees

Common Beech tree
Latin name: *Fagus sylvatica*
Mature trees grow to over 40m high and can live for over 100 years! Their bark is smooth, thin and grey in colour. Young leaves are bright green, turning reddish brown in the autumn, with distinct lines etched into the leaf. The beech tree is known as the Queen of British trees.

Elder tree
Latin name: *Sambucus nigra*
Elders can live for 60 years and reach a height of 15 m. It is characterised by a short trunk and grey-brown bark. Its individual cream flowers are tiny, with bunches 10-30cm across. Homemade elderflower wine of cordial is becoming very popular, made by soaking the flowers in boiling sugary water.

Oak tree
Latin name: *Quercus robur*
The Oak is a large deciduous (its leaves fall in the Autumn) tree which produces acorns popular with squirrels. However an oak tree won’t produce acorns until it is at least 40 years old, but can keep producing them until it’s over 120 years old!

Quick Quiz 5!

1. Are coconut palms native to Chagos?

2. What can coconut palm fronds be used for?

3. How many uses can you think of for a coconut?

4. What was Saponer used for?

5. Which tree is known as the Queen of British trees?

(Answers on pages 35-36)
Habitat Management in Chagos

Rats: a little rodent causing a big problem!

Black rats were introduced to the Chagos islands many years ago by passing ships and have had disastrous impacts on the islands. They breed like rabbits and will eat anything they can find - including bird eggs. On islands where rats are bountiful, the number of ground nesting birds have dropped dramatically. Birds are unlikely to return to these islands and the native hardwood trees struggle to grow as the rats also eat their seeds.

Rats as an invasive species

An invasive species is a plant or animal that isn’t native to a location and has spread, causing damage to the environment. After habitat destruction, invasive species are recognised as the second most severe threat to biodiversity. In Chagos, rats have been the biggest invaders.

35 of the Archipelago’s 55 islands are infested with rats, removing them from the islands should allow the ecosystem to begin to recover, increasing biodiversity and the number of naturally occurring species like seabirds, turtles and hardwood trees.

Rat eradication in Chagos

Removing rats from the islands is a tough job, as they are everywhere! However, that is just what scientists are trying to do, but where do you start?!

First the island is mapped out and lines are laid out 25m apart, dividing the island into sections. Rat poison is placed along these lines to ensure the whole island is covered and no rats are missed! This task can be harder than it sounds as the centre of the island is covered in dense coconut palms, fallen trees and over-grown Scaevola bushes. There is no guarantee all the rats will take the poison, so this process must be repeated several times.
Managing coconut plantations

Many years ago when Chagossians inhabited the islands, fields of coconut palms were planted, known as plantations, to produce food and resources for the islanders.

Since the islands have become uninhabited the coconut plantations have grown so much they are pushing out the native hardwood species of trees many sea birds like to nest in.

Talks to begin dealing with this problem across the Chagos islands began back in 2009. Reducing the number of coconut palms would increase the biodiversity across the islands and ensure there is plenty of breeding habitat for the internationally important colonies of breeding seabirds.

There are about 880 hectares (about 1,320 football pitches) of coconut plantations on Diego Garcia alone that have been left to grow out of control.

Coconut palms have little conservation value and outcompete many native hardwood trees, reducing the biodiversity found on the islands. Visiting scientists have begun to clear many of the coconut palms to re-establish native trees.

In the future expeditions may focus on the management of the vegetation on key islands along with expanding the rat eradication project to help restore the natural balance of nature.

Menazman labitat dan Chagos

Lera avek pye koko pe koz plis problem pou plizyèr lespes lo sa bann zil. Lera i manz tou espesyalman bann dizef zwazo! Plantasyon koko pe pous an deor kontrol e a prezan an konpetisyon e pe anvair bann lepes plant ou pye dibwa natif ki mazorite bann zwazo l servi pou fer zot nik. Bann siantis pe komans esey rezourd sa problèm pou kapab restor sa balans natirel lo sa bann zil.
UK Natural Habitats

The UK is home to a wide range of terrestrial (land), freshwater and marine habitats. They can range in size from a large woodland to a salt water rockpool, or even as small as a single leaf. Habitats can be home to one or two, or many thousands of species.

Woodland

A woodland is an area where many trees grow close together. As the tree’s leaves block out most of the sunlight, the plants here are adapted to living in shady areas, such as bluebells and brambles. Animals, such as owls, foxes and rabbits found in a woodland make homes on the forest floor, in the undergrowth or in the trees themselves.

The UK is now a lightly wooded country, having cleared the majority of our woods to build ships and fires. Just 11.5% of it is covered with trees. Only 1.2% is classed as ancient (very old) woodland, a valuable and irreplaceable natural resource and a priority area for conservation. Many of the UK’s woodlands are not looked after, or managed. Habitat management is critical where species of tree in open woodland are in serious decline or where the spread of non-native species (or invasive species) threaten long-established vegetation communities.

Freshwater habitats

Freshwater habitats include both flowing and standing areas of water - from fast-moving rivers and small trickling streams to large lakes and small garden ponds. A pond can be home to various plants and animals adapted to life either submerged in the pond water or on the wet banks surrounding it, such as frogs, newts, dragon flies and lily plants.
Wildlife friendly garden

The wildlife we see in our gardens is in trouble! Many of us have paved over our gardens or have neatly manicured lawns which aren’t great for wildlife to call home. As a result UK garden species have dropped in number, but we can do our bit to make our own little patch as welcoming as possible!

**Compost!** Throw garden and food waste onto a compost pile. They are great homes for worms and create somewhere warm for hedgehogs to hibernate and result in nutritious soil for your garden plants!

**Feed the birds!** Especially in the winter when there isn’t much food around. You can buy bags of cheap bird food from the supermarket.

**Build a pond!** Even a small bird bath or pond will bring in wildlife, from dragonflies to frogs, birds & bats! Just make sure anything that falls in can climb out!

**Give a bird a home!** There are boxes to attract all species of birds, from owls to robins—it may just take a little while for someone to move in!

**Don’t be a neat freak!** Dead leaves & old logs provide homes for insects and nest building material for birds & hedgehogs.

**Quick Quiz 6!**

1. What is an invasive species?

2. What effect are rats having on the number of breeding birds in Chagos?

3. Name three ways you could make your garden wildlife friendly?

(Answers on pages 35-36)
Chagossian Culture: daily life

There was a strong sense of community for those living on the Islands, everything was shared between neighbours, friends and family. They had little use for money as fruits and vegetables were grown and livestock raised. The sea was a great resource and was used for leisure and a source of food. Fishing was a daily activity that all members of the family were involved with and any extra fish were shared with others. It was the men’s role to go fishing, in boats constructed themselves. Their catch would range from large rays and turtles to a variety of reef fish.

Each morning children would wake early to help their parents with chores at home before heading to school. The majority of the islanders worked in different areas of copra production. Men would take on the physical work like gathering coconuts and removing their tough husks. Women would break open the coconuts, remove and dry out the flesh. Once the children were home from school they would help feed the animals, tend to the garden and assist with dinner preparations.

Chagossians lived on the islands in harmony with their environment, taking only what was needed and never damaging or depleting the natural resources. Their ability to read the land and the ocean was invaluable to their success. Knowledge of how to read the skies for incoming bad weather, how to predict the tides and knowing which animals to catch when was passed down through the generations.

Connect Chagos: getting in touch with your heritage

During the 2015 Connect Chagos Environmental Training Course a new session was added to the program, developed by Jenny Bertrand as part of her Internship at ZSL. The Cultural day provided a chance for trainees to delve into their heritage. Elders from the community taught us how to cook a traditional meal, dance to traditional music and shared their unique stories and memories of life on Chagos.

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Witney Naraina and Latoya Alexis preparing lunch.
Dance & music

Dance was integral to life on the islands. Women would wear elaborate head scarves and beautiful skirts when dancing around a beach bonfire. No dance would be complete without the ravan (a traditional circular drum) crafted out of local wood and goats skin. The skin would have been heated over the fire to harden it and make the drum echo to the tone they wanted. The songs were full of personal messages, making each one unique, they would sing about their life and the beautiful environment around them.

Chagossian cuisine

Fish were in abundance, from colourful reef fish to large open-ocean (pelagic) fish such as sharks and tuna. They would be grilled, fried, salted, or added to curries. The culture was rich with the knowledge of how to best make use of the environmental resources around them, even birds and crabs would occasionally be eaten.

Turtles were often caught and eaten, however the islanders respected the animal, they knew to allow females a chance to reproduce and never took more than was necessary.

Coconuts were not just used as copra or to make oil for exporting. Coconut palms were plentiful and used in a variety of different ways (see page 24). The flesh of the coconuts themselves were used as food for families and their animals, the shells made ideal bowls, the tree trunks made boats and houses and the palm fronds were weaved together to make baskets or soaked in water to create alcoholic drinks!

Quick Quiz 7!

1. What was the women’s role when preparing the coconuts?

2. Name the drum used when dancing on the beach.

3. How many different ways did they prepare and cook fish?

(Answers on pages 35-36)
Quick Quiz Answers!

1. Coral reefs
1. We find coral reefs in warm, shallow, tropical water. Typically between the Tropic of Cancer in the northern hemisphere and the Tropic of Capricorn in the southern hemisphere.
2. Coral reefs of the Chagos archipelago are special because of their incredible diversity of species and their remote location.
3. Things are more complicated in the ocean than on land, so we refer to a food web - sometimes the largest animals eat some of the smallest.
4. Coral reefs are home to 25% of all life in the ocean.
5. You are much more likely to be injured falling off a chair than being bitten by a shark!

2. Life in the ocean
1. We use the ocean in many ways, including for food, tourism and transport.
2. Reduce, reuse and recycle! Lead by example and purchase items with little or no packaging.
3. Longlining is a method of fishing where a very long line with thousands of hooks is set from a boat targeting large, predatory fish like tuna and marlin.
4. We can eat less fish and make sure the fish we do eat are from sustainable sources by using the Good Fish Guide written by the Marine Conservation Society.
5. A Marine Protected Area is an area of the ocean which is closed to fishing or has restrictions on what you can do there, enabling marine life to recover and flourish!

3. Climate Change
1. Global warming is a result of increased carbon dioxide being released and trapped in the atmosphere, resulting in an increase in temperature. Climate change refers to the changes in our climate and weather—more droughts, floods and storms etc.
2. Carbon dioxide levels have increased by 40% since the industrial revolution.
3. An increase in temperature is also linked to an increase in moisture (or rain) meaning some areas will see many more serious flooding events.
4. Ocean acidification will reduce a crab’s ability to make its calcium carbonate shell, making it much more vulnerable to predation.
4. Birds
1. 50 different species of birds have been recorded across the Chagos archipelago.
2. The islands are important for seabirds as they provide somewhere for them to rest and breed as they fly thousands of miles over the Indian Ocean.
3. Seabirds have webbed feet, a gland to help them get rid of excess salt and more feathers than shorebirds to keep them warm and waterproof.
4. I’m a Robin!
5. Some of our UK garden birds aren’t doing very well, especially in the winter when food is harder to find. We can help them by providing bird food in our gardens.

5. Plants
1. Coconut palms are not native to the Chagos islands, they likely washed up on the islands may years ago after floating on the ocean’s currents or were brought over by humans.
2. The fronds, or branches, of a coconut palm can be weaved together to make roofs, baskets, hats and decorations.
3. The flesh, water and husk of coconuts can be used in many ways including; as food, to drink, to extract the oil for burning and cooking, and the husks can be used as cups, bowls and decorations.
4. Known as “Saponer” in Mauritius or “Roz amer” in the Seychelles is widely used to treat dengue fever, diarrhoea and diabetes.
5. The beech tree is known as the Queen of British trees.

6. Habitat Management
1. An invasive species is a plant or animal which isn’t native to a location.
2. Rats will eat the eggs of birds which nest on the ground.
3. Build a pond, have a bird box & compost.

7. Chagossian Culture
1. Women would break open the coconuts, remove and dry out the flesh.
2. The *ravan* is a traditional circular drum crafted out of local wood and goats skin.
3. Fish was prepared in many different ways including being grilled, fried, salted, or added to curries.
**Glossary**
*What do those words mean?!*

**Algae:** a group of plants that typically live in water, like seaweed.

**Apex Predator:** a top predator with few, or no predators that eat it.

**Archipelago:** a large group of islands, often spread across a large area.

**Biodiversity:** the variety of life / the number of different plants and animals.

**Bycatch:** animals accidentally caught by fishermen.

**Colony:** a bird colony for example, is a large group of birds that nest close together.

**Conservation:** the act of looking after or protecting something, wild animals for example.

**Ecosystem:** all plants and animals present in a particular area & their physical environment.

**Endemic:** plants or animals who are found only in one area of the world.

**Environment:** the natural world as a whole, or a particular area.

**Evolution:** the slow development of plants and animals.

**Food chain:** a sequence of plants and animals which shows who eats whom.

**Food web:** a complex network of connected food chains.

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Terrestrial food chain example:
Grass grows and gets energy from the sun. The Zebra eats the grass. The Lion eats the zebra. The Lion sits at the top of the food chain so is the Apex Predator of that ecosystem.
Glossary

*What do those words mean?*

**Habitat:** a physical area where a plant or animal lives.

**Invertebrates:** animals which have no backbone.

**Native:** native plants and animals have been born, or grown in that location for many years.

**Niche:** the role of a plant or animal within its environment.

**Plankton:** very tiny plants (phytoplankton) and animals (zooplankton) that drift in the ocean.

**Prey:** an animal that is hunted and killed by another for food.

**Predator:** an animal that kills other animals for food.

**Sustainable:** something which is able to be maintained at a certain rate or level.

**Terrestrial:** a terrestrial animal lives on dry land.

**Vertebrates:** animals with a backbone.

**Wildlife:** animals that have not been domesticated and live in a natural environment.

**Zooxanthellae:** marine algae which lives inside coral polyps.

**Larsipel:** En gran group zil ki propaganyen dan en gran lespas.

**Biodiversite:** Sa varyete lavi/ la kantite diferan plant e zannimo.

**Konservasyon:** I sa aksyon pou regard ou protez en keksoz parey bann zannimo.

**Lanvironnman:** I lanatir global an gro ou en landwa an partikilye.

**Labita:** Sa i en landwa spesifik kot plant ou zannimo i reste.
Find out more & get involved!

UK Wildlife

- **RSPB (Royal Society for the Protection of Birds)**
The RSPB is the UK’s largest nature conservation charity, which protects threatened birds and wildlife. They run volunteer schemes, and with centres all over the country there is likely to be one near you!

  **Crawley:** RSPB Pulborough Brooks  
  **Manchester:** RSPB Dove Stone

  [www.RSPB.org.uk](http://www.RSPB.org.uk)

- **National Trust**
The National Trust offer lots of opportunities for volunteering – everything from inexpensive working holidays at over 100 locations throughout the country to full-time volunteering placements.

  [www.nationaltrust.org.uk](http://www.nationaltrust.org.uk)

  **Manchester:** Information for the National Trust’s group of Manchester volunteers can be found here: [www.mntv.org.uk](http://www.mntv.org.uk)

- **KEW Royal Botanical Gardens**
KEW has two locations, one in London (KEW Gardens) and one near Crawley (KEW Wakehurst) that we visited during the 2015 training course.

  [www.KEW.org](http://www.KEW.org)

- **The Wildlife Trusts**
The Wildlife Trust run short courses on a variety of topics, from wildlife-surveying weekends, forest sessions and bird identification.

  **Crawley:** Sussex Wildlife Trust—why not join their “Gatwick Greenspace” project to help conserve the countryside around Crawley!

  **Manchester:** Lancashire Wildlife Trust  
  [www.wildlifetrusts.org](http://www.wildlifetrusts.org)

- **The Conservation Volunteers**
The Conservation Volunteers bring communities together through conservation inspired projects from transforming neglected areas to setting up community gardens.  
  [www.tcv.org.uk](http://www.tcv.org.uk)

- **Chagos conservation Trust**
Keep in touch with the research happening across the Chagos archipelago by visiting their website:  
  [www.chagos-trust.org](http://www.chagos-trust.org)

- **Zoological Society of London**
ZSL is involved in many conservation projects, including “Garden Wildlife Health” which helps to identify and investigate the health of UK gardens:

  [www.zsl.org/science/research/gwh](http://www.zsl.org/science/research/gwh)

ZSL and United for Wildlife have been busy creating a free online course all about conservation. Head to [https://learn.unitedforwildlife.org](https://learn.unitedforwildlife.org) to sign up!
Find out more & get involved!

Marine Conservation
- **Marine Conservation Society**
The Marine Conservation Society do a lot of work for marine conservation within the UK. Throughout the year they organise beach clean up days. To get involved, pay their website a visit.
www.mcsuk.org

- **Which fish is the right fish to eat?!**
www.fishonline.org is run by the Marine Conservation Society and is a great place to figure out which fish are good to eat and which we should be avoiding.

Climate Change
- **Calculate your carbon footprint**
How big is your environmental footprint?
Our lifestyle choices make up our environmental footprint, answer a few questions to see how many Earths we would need if we all lived the way you do!
http://footprint.wwf.org.uk/

Many of the national organisations have locations in and around Crawley and Manchester. Below are a few other local places of interest.

Manchester
- **Risley Moss Nature Reserve**
Discover and explore your local nature reserve and put some of your environmental skills into action by helping out. Run by Warrington Borough Council.

Crawley
- **Tilgate Nature Centre, Crawley**
Run by Crawley Borough Council, Tilgate has over 100 species of animals, goose to mice, why not visit Tilgate and learn more about them.

Nature Apps for your smartphone!
There are some great apps for your smartphone to ensure we stay connected to nature wherever we go, check out these few examples to get you started...

- **“Nature Finder”** from The Wildlife Trusts allows you to search over 2000 nature reserves to find one near you.
- **“Plantifier”** will help you identify any plant you may find by matching it with an image.
- **“UK bird sound”** Hear a bird signing but don’t know what it is? This app has over 250 recorded bird songs for us to match with.
Connect Chagos Environmental Training Course
2012
Connect Chagos Environmental Training Course
2013
Connect Chagos Environmental Training Course
2014
Connect Chagos Environmental Training Course
2015
Connect Chagos Ambassadors on scientific expeditions in Chagos
Tailored Sessions & Open Days
2012—2015
Connect Chagos ambassador experiences:

“We had a really good time with all the lecturers. We always tried to learn something and we understood it as a group. The course was brilliant…I loved it, that’s why I got inspired to carry on (with the project)…”

“….because it’s connected to Chagos, it’s an important part. The culture is as important (as the environment) for me.” Ambassador commenting on the value of the social/cultural day

“I really love when we spent (wild) weekend doing teambuilding. We had BBQ under the stars. Everyone was helping each other.”

“I have gained knowledge and a better understanding of the Chagos environment and the importance in protecting it”

“I think it came at the right time. None of us did anything like this. I think it help us all build confidence really. It wasn’t expected, it just came into our lives and it was something brilliant.”

“I was expecting just to come out of the course with environment and learning a lot of science. But we actually learned a load more things. Team building, confidence, communication.”

“It change you into different person, I am very proud, changed me to be confident in myself, I can do anything no matter how I look like.”

“I got a good understanding of what is conservation and how it works. Before I wasn’t paying attention to conservation, (but now) I put my plastic bottle in recycle bin, I start taking initiative, turn the light off, rather cycle than car….it did change me”
The Connect Chagos project is funded by:

In partnership with...

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Website: www.zsl.org/chagoscommunity
Connect Chagos 2014 Film: http://vimeo.com/jonslayer/connectchagos2014