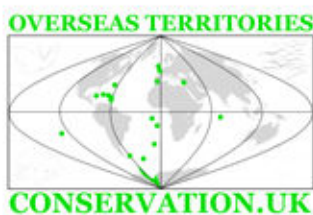


Wonderful Water

A Watery World

Wetland Ecosystems in the Turks and Caicos Islands - Part 1

Pupils' Text



TCI
Education Department



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The project was developed from an original idea by Mr Edgar Howell, Director of Education, Turks and Caicos Islands, and these materials developed by a team co-ordinated by Ann Pienkowski, Environmental Education Co-ordinator, UKOTCF. It is hoped that through the teaching materials developed for this project, students in TCI will gain a greater understanding of the importance of the water ecosystems in TCI, and the need to conserve these.

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Grand Turk, showing a variety of wetland ecosystems.

Introduction

The Turks and Caicos Islands land area is small, about 500 km². However, there are enormous areas of shallow banks (the Caicos Bank and the Turks Bank), coral reefs, extensive tidal flats and marshes, and numerous lagoons, creeks, swamps and freshwater ponds. So TCI is truly a watery environment.

These wet areas are incredibly important for wildlife, for the people of the Turks and Caicos Islands, and the future wealth and health of TCI.

We hope that you enjoy learning about the wetland treasures of TCI.

Objectives

These lessons and activities will help you to understand what is meant by ecosystem and learn about different wetland ecosystems and why they are important.

You will

- find out about some of the different wetland ecosystems in TCI
- be introduced to some of the wide variety of plants and animals which are found in wetland ecosystems
- find out about some of the ways in which an ecosystem is balanced
- discover some of the ways in which wetland ecosystems are important.



This donkey is feeding on plants which can grow in salty conditions, on an old Salt Pan

Ecosystems

What is an ecosystem?

All living things that interact within an area (or environment), make up an ecosystem. A system is something that is made from lots of different parts that do different things, but all work together. Eco comes from a Greek word (oikos) meaning house or surroundings. It has come to mean "living things", so an ecosystem is a system made from the community of living things and non-living things sharing a common space. They depend on and interact with each other.

In a pond, the plants are kept alive by the sunlight, water, air and minerals in the pond system. Some of the animals eat the plants, and some of the animals eat other animals. When a living thing dies, its body decays and the materials are recycled by micro-organisms (microbes), so they can be used again by the plants. And so it goes on. A healthy ecosystem is balanced, it keeps going by itself. We say that it sustains itself. In this unit you will learn more about ecosystems.

Ecosystems can be very small, such as a tiny pool, or a much larger lake.



This freshwater well, at North Wells, Grand Turk, is a small ecosystem.

The fish ponds on Middle Caicos form a large ecosystem



Types of Wetland Ecosystems in TCI

There are many wetland ecosystems in TCI: the submerged areas, shores, creeks, tidal flats, lagoons, marshes, salinas, mangroves, brackish and freshwater ponds.

1. The Sea: (beaches, sand banks, rocky shores and cliffs, seagrass beds, coral reefs)

Most of the Turks and Caicos Islands are actually sea. Well, the sea is wet, isn't it? So the sea is a wetland ecosystem. There are several different types of ecosystems across the shallow banks sea areas, like sand banks, seagrass beds and coral reefs.

The coral reefs are well known. Lots of tourists visit TCI to dive and snorkel over the coral reefs. You might know that the seagrass beds are important as natural nurseries for young fish and conch. But all the other wetland ecosystems have their own special importance, for wildlife and people. These lessons and activities will help you to learn more about some of TCI's special wetland ecosystems.



The sea is one of the wetland ecosystems in TCI.

2. Flats and marshes

Intertidal sand and mud flats, which are regularly flooded by high tides, or covered by heavy rain or wind-blown seas, cover a large area of TCI. Special plants, like glasswort, salicornia, the Turks and Caicos Heather grow here. They can survive harsh conditions, which can vary from dry, being covered by salt water, or flooded by brackish water. (Brackish water is saltier than fresh water but not as salty as the sea.) Large numbers of small animals, like small shellfish and worms and other invertebrates, live in the ground. They provide food for birds and fish. This ecosystem is kept healthy because the sea regularly brings more nutrients into the area.



These flats and marshes are on Middle Caicos.

3. Salinas

Salinas, salt pans and salt ponds, are very common in TCI. The water in them is usually saltier than the sea, because as the water evaporates under the hot sun, the salt from the seawater is left behind. There are some small animals, like shrimps and fish, that live in this very salty water, and these provide food for many different kinds of birds, like pelicans, herons and flamingos. Water from heavy rain can drain into the salinas, so the salinas give flood protection as well. Clearly the salinas are another very important ecosystem. In the warm water, the small animals grow quickly. Dead animals decay quickly, to return their nutrients to the ecosystem. Bird droppings also return nutrients to the ecosystem.



At first glance, salinas might not look as if they are important for wildlife, but many animals and plants depend on them

4. Lagoons and Mangroves

Lagoons are protected inlets which are usually tidal and open to the sea, at least during very high tides. Mangroves are found around the edges of the lagoon and in other marsh / sea edges. Mangroves are very special plants because they are the only trees that can live in salt water. The leaves of the mangroves drop into the water and provide a surface for algae to live on. This is a key factor in sustaining this ecosystem. Young fish eat the algae. There is not a lot of food in the ocean for young fish, so the mangroves provide a place where young fish are safe and can grow. Without the mangroves there would not be so many fish in the sea. The thick mud at the bottom of the lagoon is the home for many small invertebrate animals, like worms and shellfish. Birds and fish eat these. Sometimes people do not like these places, because there can be lots of mosquitoes there.

In some places people have cut down the mangroves, to get rid of the mosquitoes or for built development. Then fishermen realised that there were not so many fish in the sea. When hurricanes came, people also realised that the mangroves protected the land from hurricane damage.



The mangrove roots in the water provide a safe place for young fish to live and grow.

5. Brackish ponds

Many inland water areas in TCI are brackish. Brackish water is more salty than fresh water, and less salty than the sea. The sea water can enter these inland areas over low land, or from underground passages connected to the sea. The hot sun also evaporates the water, making what is left more salty. Like the lagoons, the mud at the bottom of brackish ponds is the home for small shellfish and worms, which fish and birds feed on. Like the salinas, the warm water means that dead animals decay quickly, recycling nutrients and keeping the ecosystem healthy.



This small brackish pool might not look very interesting, but the mud contains lots of small animals which birds can feed on.

6. Swamps



This swamp has many different kinds of plants growing in it.

Swamps are wet areas of land with plants growing in them. Lots of plants means lots of animals can live here too. We say that areas like this are very productive. The invertebrates in the mud are food for many birds. People do not like swamps because mosquitoes breed in them, although the birds like to eat the mosquitoes! But swamps trap rainwater which eventually runs underground.

This is where the well water comes from. Without the swamps, the rainwater would run off into the sea, or evaporate in the hot sun. Then eventually there would be no freshwater left in the wells. This ecosystem is quite fragile. During a drought, some swamps can dry out. The plants can survive as seeds, and will grow again when the rain comes. The birds can fly away, but they have to be able to find another place with freshwater. Some of the small animals can stay alive, but dormant, in the mud until it rains again.

7. Freshwater ponds and sinkholes

Freshwater is a precious resource, so the places where freshwater is found are incredibly important for different kinds of plants and animals which cannot survive without freshwater, and this includes people!

Freshwater can be found in certain sinkholes throughout the Turks and Caicos Islands all of the time. It is permanent. Sinkholes are natural, usually circular, holes in the limestone rock. They are often quite deep. Different kinds of plants grow here, some underneath the water. Ducks like to eat these underwater plants. Some of these ducks, like the West Indian Whistling Duck, are endangered, so it is very important that these freshwater ponds are protected. This is one place that birds can go to if the swamps dry out.



This sinkhole is on Middle Caicos.

Village Pond on Middle Caicos is an important freshwater ecosystem. This pair of endangered West Indian Whistling Ducks raised their ducklings here.



Summary

Wetlands are amongst the most varied ecosystems in the world. They provide food for all sorts of animals. Many different plants grow there. They provide safe places for young fish to grow. They protect the land from storms and hurricanes. They provide the freshwater which many plants and animals, including people, need. There are many connections between the different wetland ecosystems, such as young fish in the mangrove areas becoming adult fish in the sea. So the wonderful variety of wetlands in TCI means that TCI has a wonderful variety of wildlife. Many tourists come to TCI to enjoy this wonderful wildlife, so the wetlands (even if they have mosquitoes at some times of the year), are a very important part of the TCI tourism industry. This kind of tourism is sometimes called Ecotourism. Some tour operators in TCI advertise Ecotours for visitors.



Ecotourists really like seeing flamingos. These flamingos are on Big Pond, Middle Caicos. Big Pond is a salt pond ecosystem, and is more salty than the sea.