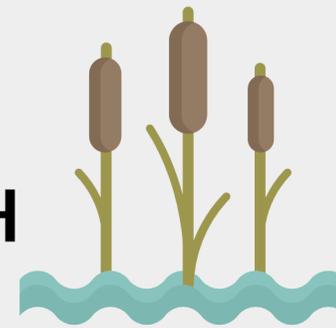


HABITATS OF THE FIRTH



INTRODUCTION

As the Tay nears the North Sea, it broadens out into the Firth of Tay or Tay estuary and forms a range of distinctive habitats for wildlife: reedbeds, mudflats, sandbanks and salt marshes. We suggest some approaches for investigating some of these unique habitats: finding out what makes them special, what wildlife they support and how they are threatened.

Following this, we provide brief background information and an link to the content for pupils which appears on the website.

SUGGESTIONS FOR TEACHING AND LEARNING ACTIVITIES

INTRODUCTORY ACTIVITIES



Use Google maps or similar to follow the course of the Tay from Loch Tay to the sea.

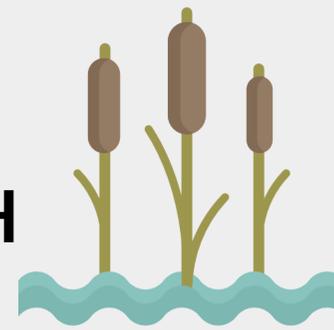
- What can pupils see?
- How does the river change in appearance?
 - Can pupils describe what they see as it broadens out?
 - What/how many different habitats can they see?
 - What does this mean for wildlife?

This article provides a good introduction to estuaries:

<http://www.rspb.org.uk/discoverandenjoynature/families/children/discover/habitats/estuaries.aspx>

Look at the website resources to explore the range of habitats of the Firth of Tay.

HABITATS OF THE FIRTH



SUGGESTIONS FOR TEACHING AND LEARNING ACTIVITIES

CURRICULAR AREA

Social Studies: People, Place and Environment

EXPERIENCES & OUTCOMES

Through activities in my local area, I have developed my mental map and sense of place. I can create and use maps of the area.
SOC 1-14a

To extend my mental map and sense of place, I can interpret information from different types of maps and am beginning to locate key features within Scotland, UK, Europe or the wider world.
SOC 2-14a

I can describe and recreate the characteristics of my local environment by exploring the features of the landscape.
SOC 1-07a

KEY LEARNING ACTIVITIES

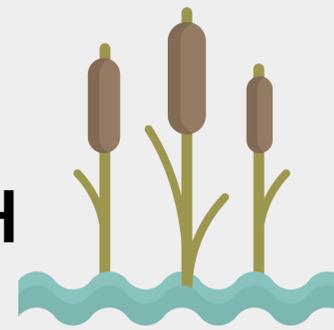
Pupils use maps and aerial photography to create and annotate their own maps, labelling habitats of the estuary. The leaflet provided on the website includes a map showing the location of the various habitats:
Inner Tay Estuary: a special site for wildlife
<http://www.pkc.gov.uk/CHttpHandler.ashx?id=11020&p=0>

Pupils could create a classroom model or display of the Tay estuary. Here are some examples of models and displays:

<http://www.3dgeography.co.uk/#!river-models/ctqu>

<http://3dgeography.wix.com/geography-pictures#!rivers-class-displays/y559r>

HABITATS OF THE FIRTH



SUGGESTIONS FOR TEACHING AND LEARNING ACTIVITIES

CURRICULAR AREA

Literacy
English Writing: Creating
Texts

EXPERIENCES & OUTCOMES

Having explored the elements which writers use in different genres, I can use what I learn to create my own stories, poems and plays with interesting structures, characters and/or settings.
ENG 1-31a

Having explored the elements which writers use in different genres, I can use what I learn to create stories, poems and plays with an interesting and appropriate structure, interesting characters and/or settings which come to life.
ENG 2-31a

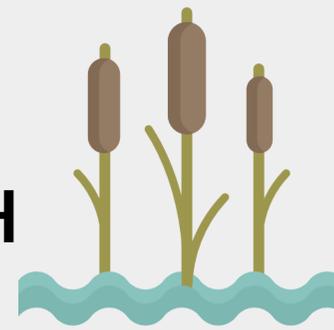
KEY LEARNING ACTIVITIES

Pupils create poems describing the journey and features of the River Tay.

See these examples of poems about poems written in Scots for inspiration:

<http://www.educationscotland.gov.uk/knowledgeoflanguage/sharedpracticeknowledgeoflanguage/theriverssang.asp>

HABITATS OF THE FIRTH



SUGGESTIONS FOR TEACHING AND LEARNING ACTIVITIES

CURRICULAR AREA

Social Studies:
People, Place
and Environment

EXPERIENCES & OUTCOMES

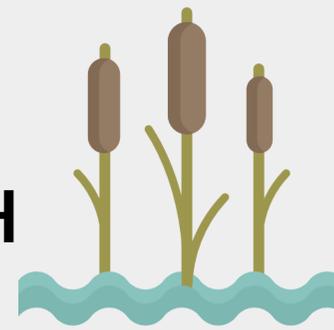
I can describe the major characteristic features of Scotland's landscape and explain how these were formed.
SOC 2-07a

KEY LEARNING ACTIVITIES

Pupils investigate how the various features of the firth were formed (e.g. sandbanks, flood plains to either side, reed beds).

See this document for further information:
Firths: Scotland's living landscapes
<http://www.snh.org.uk/pdfs/publications/livinglandscapes/firths.pdf>

HABITATS OF THE FIRTH



SUGGESTIONS FOR TEACHING AND LEARNING ACTIVITIES

CURRICULAR AREA

Social Studies:
People, Place
and Environment

EXPERIENCES & OUTCOMES

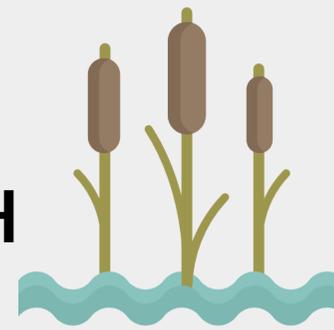
Having explored the landscape of my local area, I can describe the various ways in which land has been used.
SOC 1-13a

KEY LEARNING ACTIVITIES

Using some of the material online, pupils investigate how reeds from the Tay reedbeds were used in the past until very recently.

- See: Aerial Image of reedbeds <https://canmore.org.uk/file/image/1107306>
- Image of reedbeds <http://www.geograph.org.uk/reuse.php?id=329509>
- Image of bundle of reeds for thatching <http://www.geograph.org.uk/reuse.php?id=477457>
- Image of horse laden with reeds for thatching, 1940 [http://www.scran.ac.uk/database/image.php?usi=000-000-129-890-R&cuci=000-000-129-890-C&scache=40ttv3hmkm&searchdb=scan](http://www.scran.ac.uk/database/image.php?usi=000-000-129-890-R&куси=000-000-129-890-C&scache=40ttv3hmkm&searchdb=scan)
- Article about how thatching has come to an end <http://www.telegraph.co.uk/news/uknews/1486639/Reed-beds-reach-end-of-an-era.html>

HABITATS OF THE FIRTH



SUGGESTIONS FOR TEACHING AND LEARNING ACTIVITIES

CURRICULAR AREA

Science
Planet Earth:
Biodiversity
and Interdependence

EXPERIENCES & OUTCOMES

I can identify and classify examples of living things, past and present, to help me appreciate their diversity.

I can relate physical and behavioural characteristics to their survival or extinction.

SCN 2-01a

I can explore examples of food chains and show an appreciation of how animals and plants depend on each other for food.

SCN 1-02a

I can use my knowledge of the interactions and energy flow between plants and animals in ecosystems, food chains and webs. I have contributed to the design or conservation of a wildlife area.

SCN 2-02a

KEY LEARNING ACTIVITIES

Pupils investigate the wildlife supported by the habitats of the Firth of Tay. If possible, contact local rangers to see if they can support a field trip.

<http://www.taysidebiodiversity.co.uk/tayside-biodiversity-partners/tayside-recorders-introduction/tayside-recorders-list-of-contacts/tayside-recorders-list-of-contacts-ranger-services/>

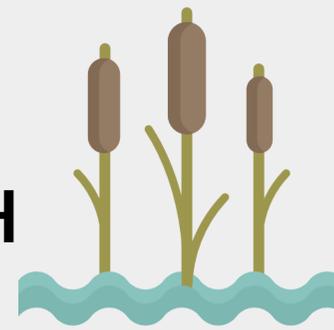
This (quite technical) document is specifically about the wildlife of Tayside:

<http://www.taysidebiodiversity.co.uk/wp-content/uploads/2015/01/Section2Coast2.pdf>

This (fairly technical) document has some good diagrams showing the range of species a section of reedbed can support

https://www.rspb.org.uk/Images/bringing_reedbeds_to_life_tcm9-385799.pdf

HABITATS OF THE FIRTH



SUGGESTIONS FOR TEACHING AND LEARNING ACTIVITIES

CURRICULAR AREA

Science
Planet Earth:
Biodiversity
and Interdependence

EXPERIENCES & OUTCOMES

I can identify and classify examples of living things, past and present, to help me appreciate their diversity.

I can relate physical and behavioural characteristics to their survival or extinction.

SCN 2-01a

I can explore examples of food chains and show an appreciation of how animals and plants depend on each other for food.

SCN 1-02a

I can use my knowledge of the interactions and energy flow between plants and animals in ecosystems, food chains and webs. I have contributed to the design or conservation of a wildlife area.

SCN 2-02a

KEY LEARNING ACTIVITIES

Pupils can investigate two of the rare species currently thriving in the Firth of Tay – the water vole and the bearded tit. These resources give more information and activities:

- <http://www.snh.org.uk/pdfs/education/watervolefactsheet.pdf>

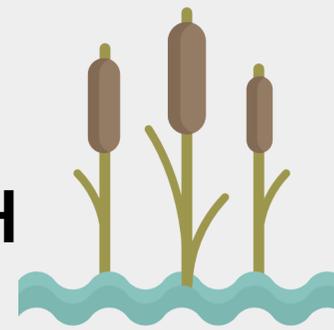
- http://www.rspb.org.uk/news/409396-bearded-tits-thriving-in-the-tay-reedbeds?utm_source=rss&utm_medium=feed&utm_campaign=News

- <http://www.snh.org.uk/pdfs/education/poster/p-watervoles.pdf>

This online game conveys some of the threats to water voles:

<http://www.rspb.org.uk/discoverandenjoynature/families/children/play/savethevole.aspx>

HABITATS OF THE FIRTH



SUGGESTIONS FOR TEACHING AND LEARNING ACTIVITIES

CURRICULAR AREA

Science
Planet Earth:
Biodiversity
and Interdependence

Literacy
English Writing:
Creating Texts

EXPERIENCES & OUTCOMES

I can consider ways of looking after my school or community and can encourage others to care for their environment.
SOC 1-08a

I can discuss the environmental impact of human activity and suggest ways in which we can live in a more environmentally-responsible way.
SOC 2-08a

I can convey information, describe events or processes, share my opinions or persuade my reader in different ways.
LIT 1-28a / LIT 1-29a

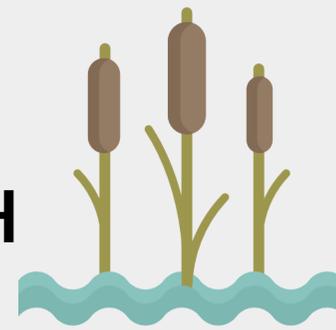
I can persuade, argue, explore issues or express an opinion using relevant supporting detail and/or evidence.
LIT 2-29a

KEY LEARNING ACTIVITIES

Certain species of the Firth of Tay are under threat (e.g. water voles). Pupils could find out about the threats to these species, and what they can do to help.

Pupils could create a poster, leaflet or devise an information campaign to encourage people to take steps to protect these habitats and species.

HABITATS OF THE FIRTH

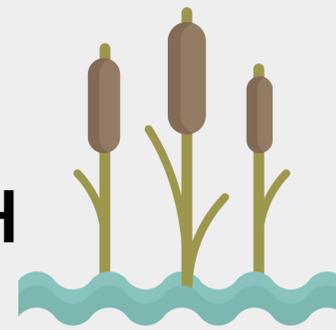


BACKGROUND INFORMATION

GENERAL

- The Firth of Tay is one of the largest estuaries in Scotland, and carries the most fresh water to the sea of any estuary in Britain.
- The firth features a range of habitats, including mudflats, reedbeds, saltmarshes, underwater habitats or 'sub-tidal' zones, sandbanks, shingle and coastal grazing marsh.
- Key wildlife of these habitats include: common seal, otter, shelduck, pink-footed goose, eider duck, bearded tit, reed bunting, salmon and water vole.
- This leaflet produced in 1999 by SNH gives a good overview of the habitats of the estuary:
<http://www.pkc.gov.uk/CHttpHandler.ashx?id=11020&p=0>

HABITATS OF THE FIRTH

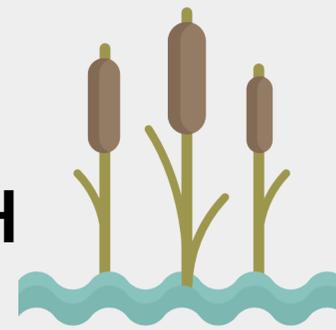


BACKGROUND INFORMATION

REEDBEDS

- Reedbeds can be found on both north and south shores of the estuary, downstream from Perth. They were originally planted in the 19th century to protect farmland but have since expanded naturally.
- The beds on the north shore, south of Errol are the longest in Britain.
- The reeds were used for thatching roofs, right up to 2005.
- Today they provide an important habitat for rare bearded tits. In 2014, 723 of these charismatic birds were ringed at the Tay reedbeds – more than double the number in 2013.

HABITATS OF THE FIRTH



BACKGROUND INFORMATION

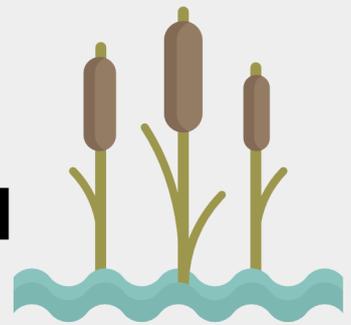
MUDFLATS AND SALTMARSHES

- Mudflats support large numbers of birds and fish. They provide feeding, resting and wintering areas for migrating birds.
- Saltmarshes form the shore areas of mudflats. They are built up by plants which thrive on immersion in salty water. They provide breeding sites for waders and gulls.

THREATS TO THESE HABITATS INCLUDE:

- Land claim – developing these areas for housing, farming, forestry or industry
- Climate change and consequent sea level rise
- Pollution from farming and industry
- Human disturbance, including bait digging
- Waste dumping

HABITATS OF THE FIRTH



The river Tay **CARRIES MORE** fresh water to the sea than any other river in **BRITAIN**.

These places are homes for all kinds of wildlife: **COMMON SEALS, OTTERS, PINK-FOOTED GOOSE, EIDER DUCK, BEARDED TIT,** and **WATER VOLE**.

The reeds were used for **THATCHING ROOFS**, right up to 2005.

Between the mud and the shore you can find **SALTMARSHES**. They are built up by plants which like salty water. **SEA BIRDS** and **WATER VOLES** live here.

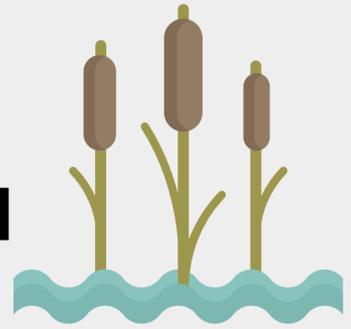
In the Firth of Tay you can find a range of habitats such as **MUDFLATS, REEDBEDS,** and **SALTMARSHES**.

There are reedbeds on the **NORTH** and **SOUTH** shores of the estuary. The reed beds near **ERROL** are the **LONGEST** in Britain.

Today they provide an important habitat for rare birds called **BEARDED TITS**. Mudflats are large areas of mud by the shore. They provide **FEEDING, RESTING** and **WINTERING AREAS** for migrating birds.

All of these habitats are **THREATENED** by humans – **POLLUTION, CLIMATE CHANGE, BUILDING** and **FISHING**.

HABITATS OF THE FIRTH



REEDBEDS

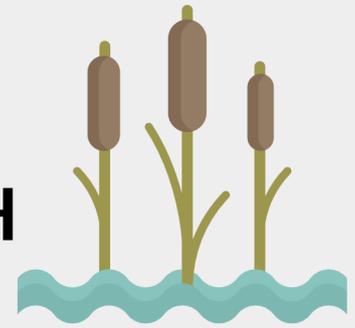
There are reedbeds like this on the **NORTH** and **SOUTH** shores of the Tay estuary. The beds on the north shore near **ERROL** are the **LONGEST** reedbeds in Britain!

The reeds were used for **THATCHING ROOFS**, right up to 2005.

They were planted in the **1800'S** to protect farmland, but now they just **GROW NATURALLY**.

Today they are an important **HABITATS** for birds and other wildlife.

HABITATS OF THE FIRTH



SALTMARSHES & MUDFLATS

Mudflats are **MUDDY** areas which are covered with **SEAWATER** at **HIGH TIDE**.

Saltmarshes lie between **MUDFLATS** and **DRY LAND**. They are built up by **PLANTS** which thrive on **IMMERSION** in salty water. They provide **BREEDING SITES** for **WADING BIRDS** and **GULLS** and are home to the rare **WATER VOLE**.

They provide homes for large numbers of **BIRDS** and **FISH**, and **FEEDING, RESTING** and **WINTERING** areas for migrating birds.





A special place for birds

On a good winter's day, you'll see great skeins of pink-footed and greylag geese as they make their way to and from the farmland along the Firth of Tay. From time to time, a cloud of bar-tailed godwit will take off from the mudflats. Redshank, lapwing, grey plover, sanderling, other waders and shelduck will be searching for food in the mud while merganser, eider and other ducks ride out on the water, sometimes diving for fish and molluscs.



Laurie Campbell

Bar-tailed Godwits probe continuously for crabs, shrimps and worms.

Large numbers of cormorants roost on the sandbanks and fish for eels, smelt and other fish in the surrounding water. Smelt are now rare fish, living in only two or three estuaries in Britain. In the reedbeds, water rail make use of muddy patches for finding worms and other invertebrates; flitting among the reeds (called *Phragmites*), sedge and grasshopper warblers chase insects for food.

Sedge Warblers hide among the reedbeds waiting to dart out and catch insects.



SNH

Working waters

Nearly 2000 years ago, the Romans crossed the River Tay from their fort at Carpow. The monks of Balmerino almost certainly crossed the river by boat. Ferries plied their way until the late 1900s when, like most fishing boats and salmon-netters, they became a memory.

But the Tay is still a working waterway. Cargo vessels sail to and from Perth, passing agricultural land and small settlements scattered along the estuary. There's now little commercial fishing – most salmon have a free run up to the spawning waters but a few men still net them.

The reedbeds are harvested from December to March and the reeds are then dried, trimmed and dispatched to thatchers throughout Britain. Farmers graze cattle on the saltmarsh and this is good for wild flowers.

Wildfowling still enjoy dawn expeditions along the estuary to shoot geese and ducks for their own tables.



Harvested reeds near Errol are prepared for sale to thatchers all over the country.

A river for all reasons

Most people know something about the River Tay, one of Scotland's longest rivers. It gathers Highland waters in Loch Tay and offers anglers and canoeists considerable challenges in its upper reaches. It appeals to artists and photographers as it meanders towards Perth from where it provides a route for seaborne cargo in its Firth.

In the inner estuary – the *Site of Special Scientific Interest* – the river broadens, creating great sandbanks with names like Carthage Bank and Sure as Death Bank on which ships came to grief until high tide. Mugdrum Island, which is fringed by reeds and has a sea wall to stop the grazing land from being flooded by the tide, separates the North and South Deeps, the channels safe for ships. All the channels along the Firth are excluded from the SSSI but are home to shoals of smelt, a small, salmon-like fish that tastes of cucumber.

Reeds used for thatching houses grow along both river banks – the beds on the north bank are the largest in Britain. Beyond them lie saltmarshes and intertidal mudflats, rich in food for wading birds. The Local Nature Reserve at Invergowrie is a good place to see them.

The rich farmland along both shores of the Tay results from glacial action which left fertile deposits at the same time as it carved out the bed of the river. To the north lies the Carse of Gowrie which is famed for its raspberries and to the south you can still see ancient woodland at Flisk Wood and Ballinbreich.



Fertile, mixed farmland borders both banks of the inner Tay estuary.

Do you know about who eats what?

The Tay, like any habitat, contains a web of life. Invertebrates in the mudflats and sandbanks eat tiny organisms (and sewage), birds and fish feed on invertebrates, cormorants, seals and people eat the estuary's fish. Many species of insect live in the reedbeds and saltmarshes, providing food for birds. The reeds give protection to nesting birds, including water rail and the grasslands along the river are feeding grounds for geese.

This diversity is one of the reasons why the SSSI is so important – and it's equally important that the balance of species is not disturbed by human activity.



Redshanks, with their distinctive piping call, eat salt-marsh invertebrates.

Laurie Campbell



Oystercatchers eat worms and shellfish, stabbing open mussels with their beaks.

It's strange but true ...

Sewage and other nutrients flow into the estuary and improved treatment of this effluent will make the estuary cleaner. But, because worms and molluscs feed on the sewage and lots of birds eat these invertebrates, cleaner water could mean less food and fewer birds. On the other hand, too much sewage and other nutrients increases the amount of algae, smothering the invertebrates. This could also affect the numbers of birds feeding in the estuary.

The challenge for the environment here is to maintain a balance where birds and people can live together.



The big picture

Viewpoints along the estuary provide spectacular panoramas of the Tay – one of the best is on the south bank at the layby on the coast road west of Ballinbreich. At low tide, you see the whole spread of sandbanks, saltmarshes and distant mudflats which make the estuary such an important habitat.

Private land restricts access to many stretches of the foreshore and it's best to ask locally for advice where there are no rights of way.



The Tay's patterns of land, water and sandbank are seen best from the air.

P & A Macdonald

The future of the SSSI for wildlife – and for people's enjoyment of the estuary – depends on different interests working together – farmers, reed cutters, local people and businesses, wildflowerers, fishermen, government agencies and voluntary bodies. So far, cooperation has worked well. It has to continue if people and wildlife are to live in harmony.

What about the future?

SNH plays an important advisory role on the needs of wildlife when new developments are being considered. It is always consulted on planning issues affecting the Inner Tay Estuary SSSI. However, along the inner Tay estuary, sensible use of the area has meant that the SSSI has maintained its importance for birds and other wildlife. With care and sensitive management this should continue into the future. SNH plays an important advisory role on the needs of wildlife when new developments are being considered. It is always consulted on planning issues affecting the Inner Tay Estuary SSSI.

Do you know about ... potential threats to the birds?

New homes and industrial development near the shores of the Tay could lead to more people, cats and dogs disturbing wildlife; increased noise and pollution could damage habitats. Oil spills are a risk in coastal areas and can lead to oiling of birds and contamination of their food.

The inner estuary of the River Tay, from its confluence with the River Earn to the Tay Rail Bridge, is a haven for geese and other waterfowl. Some spend the whole winter here, others use the Tay for 'refuelling' on migratory journeys. The attraction is the mudflats that are exposed at low tides, the sandbanks, saltmarshes and reedbeds where they can feed and roost.

The populations of goldeneye, cormorant, pink-footed and greylag geese and other birds are both nationally and internationally important. For this reason, the inner estuary of the Tay has been notified as a *Site of Special Scientific Interest*. This site is one of four SSSIs in the Firth of Tay which, with the Eden Estuary in Fife, is being proposed as a *Special Protection Area* under the provisions of the European Union's *Wild Birds Directive*. The directive is part of *Natura 2000*. SNH is consulting widely on the proposal and also considers that the area meets the criteria for designation as a *Ramsar* site under the Convention (held at Ramsar, Iran) on Wetlands of International Importance.

Conserving the estuary and its shores means working with the local community to agree how best to manage the habitats in the interests of the birds and plants – and of the people who live and work in the area.



Cormorants hang out their wings to dry after diving for fish.



Scottish Natural Heritage is the government agency that works to conserve and enhance Scotland's natural heritage of wildlife, habitats and landscapes. It aims to help people enjoy this natural heritage responsibly, understand it more fully and use it wisely so that it can be sustained for the future.

For more information, please contact:
 Scottish Natural Heritage
 Battleby, Redgorton
 Perth
 PH1 3EW
 Tel: 01738 444177



The Tay Rail Bridge forms the eastern boundary of the Inner Tay Estuary.

Text by Michael H Glen, Touchstone Heritage Management Consultants
 Printed in Scotland on environmentally-friendly paper, 1999

Within the Firth, the Inner Tay Estuary Local Nature Reserve lies on the outskirts of Dundee and is used by a variety of birds all year round. You can see and hear curlew, redshank, oystercatcher, lapwing, bar-tailed godwit and dunlin, each with their distinctive calls. Shelduck and other birds nest in and near the reeds. In winter, huge numbers of pink-footed and greylag geese wheel overhead before flying north in spring to breed in Greenland and other Arctic countries.

Waders and other waterfowl

The Tay reedbeds are commercially important and 40% is harvested each year. This reduces habitat temporarily but prevents scrub invasion and helps regrowth. The cutting machine wheels leave muddy areas where water birds can feed. It's a good example of commercial activity and conservation working in partnership. The local wildflowerers' association manages Muddrum Island as a bird refuge where grazing of cattle and sheep improves the wet grassland habitat. This encourages geese to feed and wading birds to breed there. The association has a voluntary agreement not to shoot birds on the island. SNH works in partnership with many organisations to resolve potential conflicts between the interests of the community and those of the natural world.

Conservation at work

One of the best routes into the reserve is the path from Invergowrie Station.

If the Firth of Tay is to continue to support these birds, then conserving and managing their habitats is essential. Scottish Natural Heritage advises and helps public, private, voluntary and local organisations, and individual landowners, to achieve good management for effective conservation.

The wintering and migrant waterfowl that assemble along the inner Tay estuary are so numerous and diverse that the area is recognised as being of international importance for its bird populations. Goldeneye and cormorant, redshank and bar-tailed godwit, eider and shelduck, pink-footed and greylag geese congregate to feed and roost on the mudflats and saltmarshes at low tide.



Pink-footed geese flying to their roost is a regular winter spectacle.

Birds, birds and more birds – or fewer?

Inner Tay Estuary

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Bearded tits thriving in the Tay reedbeds

Last modified: 07 November 2015



Image: **Andy Hay**

Long-term monitoring of one of the country's most charismatic little birds has revealed that the River Tay is possibly their largest stronghold in the UK.

Bearded tits are found only in reedbeds and the historic loss of habitat across Britain has resulted in the population being fragmented and dissipated across isolated areas.

But records from ringing work – where ornithologists fit minute identification bands on the birds' legs to gather monitoring data on their movements and lifespan – has shown that 2014 was a record-breaking year.

In 2014 723 of these charismatic birds were ringed at the Tay reedbeds – more than double the number in 2013.

Data from the BTO also showed that the Tay reedbeds were home to 45 per cent of the bearded tits ringed in Britain last year, highlighting the importance of this site to the country's population.

The ringing work was undertaken by the Tay Ringing Group along with Iain Malzer, whose PhD research is revealing more about the movements of these birds. One day alone 76 bearded tits were ringed, and of the 55 ringing days seven of those included catches of over 60 birds.

Surprisingly, the birds only colonised the reedbeds along the Tay, the largest continuous area of reedbed in Britain, in the early 1990s.

RSPB Scotland manages more than half of the reed bed area, working with local landowners to protect and conserve this important habitat which is also home to species such as sedge warblers, water rails, marsh harriers, and reed buntings. Reedbeds are very fast growing and the cutting and management of them is crucial to creating the best possible habitat for bearded tits and other wildlife.

Heather McCallum, RSPB Scotland reserves ecologist: "The Tay reedbeds are a stronghold for bearded tits in Britain and the work done by the Tay Ringing Group and Iain during the course of his PhD means that we're able to keep track of how the birds are faring here. This data not only underlines the importance of the Tay reedbeds to the population but also demonstrates how the careful management of this environment has enabled these birds to thrive here.

"Bearded tits are an amber list species and although 2014 was a good year for them at the Tay they are vulnerable to severe winters. Numbers can fluctuate year on year so it's vital that we continue to manage the reedbeds to maximise the quality of their habitat"

Iain Malzer said: ""The bearded tits on the Tay are reacting positively to RSPB Scotland's reed management and over the course of the study we've learned lots about how these birds interact with their specialist habitat.

"We placed radio-trackers on close to 40 bearded tits over two breeding seasons, allowing us real insight into the habitat selection of these normally elusive birds. We noticed that, while old, dry, patches of reed are critical for nesting, almost all foraging trips occurred in more open, previously managed reed where invertebrates were easier to catch. The key looks to be in creating patches of reed at different ages, offering a variety of resources for the bearded tits to exploit.

"The staggering numbers recorded on the Tay in 2014, which were almost certainly due to a combination of management and favourable breeding conditions, led to the dispersal of many individuals throughout Scotland. Thus, appropriate management at this site could even help encourage these birds to spread and occupy new reedbeds."

Steve Moyes from the Tay Ringing Group: "It is encouraging that at long last the bearded tits have expanded from the Tay and moved out to other parts of Scotland. I am confident that in the future we will see bearded tits successfully breeding in a number of Scottish reedbeds."

Bird guide

Bearded tit

Blogs

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The RSPB is a member of **BirdLife International**, a partnership of conservation organisations working to give nature a home around the world. **[Find out more about the partnership](#)**

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Biodiversity Links

The water vole is part of Scotland's biodiversity, (which means the variety of life, and includes plants and animals, and the places in which they live). To help children understand how everything links and review their understanding of biodiversity, photocopy the cards on the reverse of the water vole poster. Cut them out and group into the following categories:

1. **Mammals** (warm blooded, give birth to live young and feed them on milk)
2. **Birds** (warm blooded, have feathers, lay eggs, most can fly)
3. **Reptiles** (cold blooded, lay eggs on land, often have scaly skin)
4. **Amphibians** (cold blooded, lay eggs in water, but the adults can live on the land, soft skin)
5. **Fish** (cold blooded, have scales, breathe in water using gills)
6. **Invertebrates** (small creatures without a backbone)
7. **Plants** (have green leaves and use energy from sunlight to make food)

Can you add another one of your choice to each category?

Can you catch a water vole game

Water voles eyesight is not very good but it does have very good hearing. How good is your hearing – would you make a good water vole?

Game

- The one chosen to be the “water vole” sits blindfolded on the ground, other children are “predators” and sit scattered around.
- The leader picks a child to try and reach the “water vole” without being heard. If the “water vole” thinks he hears someone he points in that direction and shouts “predator!”. If correct – that child is “out”.
- If the “predator” manages to touch the “water vole” on the knee before being pointed at then the “water vole” is caught!



All about Water Voles



Water voles are the largest voles in Britain, and are often mistaken for rats. Sometimes they are called water rats and ‘Ratty’, in the story ‘Wind in the Willows’, by Kenneth Grahame, was actually a water vole, not a rat.

In and out the water

Water voles live close to water and spend a lot of time swimming and eating plants on the bankside. They dive into the water with a ‘plop’ when they are frightened.

Water voles have:

Very thick, special hair which traps air when they dive under the water. The trapped air keeps the cold water away from their body and so keeps them warm.

Small ears and inside the ears is a special flap of skin which closes when the water vole dives under the water.

Surprisingly, however, water voles are rather basic swimmers.

Otters live in water and have webbed toes - check the photo to see if water voles do too?

A vegetarian ‘rat’

The character ‘Ratty’ in the story ‘Wind in the Willows’, ate chicken sandwiches and went fishing, however water voles do not really eat fish (or chickens).

They eat stems, leaves, roots, bulbs, flowers and bark of lots of different waterside plants including grass. Water voles store food inside their burrows and are very fond of apples.

A water vole can find wind-fall apples in gardens or crab apples growing wild and float them across a river to its burrow!

Water Vole Facts

Water voles are rodents like mice, rats, gerbils and hamsters. This means that they have long front teeth which never stop growing yet are always being worn away by nibbling.

They are about the size of a large hamster (12-20cm long). Their fur is glossy brown or black (particularly in Scotland) and some water voles have small white patches of fur too. Unlike rats they have hairy tails.

Water voles live for about 2 years.

Females can have up to 5 litters a year between April and September with up to 6 babies in each litter. In Scotland, however, they usually have fewer babies.

(Can you work out how many baby water voles one water vole could have in a year?) This might sound like a lot but water voles also have a lot of predators such as owls, rats, stoats, herons, eagles, mink, cats and even large fish.



Biodiversity

What can we do to help? Looking after Scotland's wildlife and countryside is important if we want to keep water voles and the places where they live.

- Enjoy watching Scotland's wildlife and remember to be as quiet as you can – so that you do not disturb the animals
- Take your rubbish home – and recycle it
- Join or start a group that looks after your local area for wildlife

For further information and images

http://news.bbc.co.uk/cbbcnews/hi/newsid_6080000/newsid_6082800/6082848.stm

www.waterscape.com/features/wildlife/water_vole.html

www.abdn.ac.uk/mammal

www.arkive.org/species/ARK/mammals/Arvicola_terrestis

www.snh.org.uk/speciesactionframework

Glossary

Adapted – to change something to fit new circumstances

Burrow – a hole in the ground dug by an animal for shelter

Habitat – the natural home of an animal or plant

Predator – an animal that kills and eats other animals

Prey – an animal hunted as food for another animal

Rodent – belonging to the group of animals which includes rats, mice and squirrels

Vegetarian – a person or animal that doesn't eat meat

Acknowledgements

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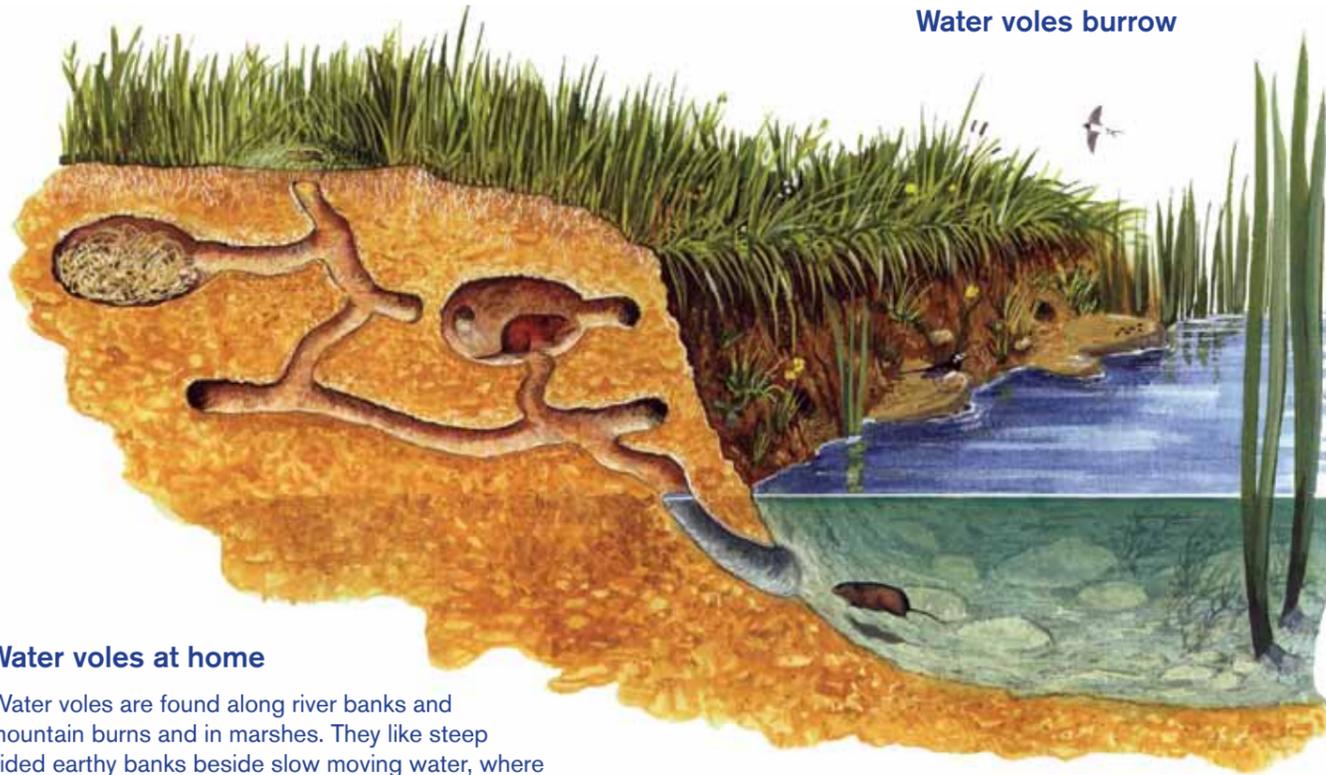
Photography: Laurie Campbell and Alan Ross

Also many thanks to all those who helped in the development of this fact sheet, in particular the teachers involved in this project, Highland Council Ranger Service, and SNH specialists.

There is a poster to go with this factsheet and other posters and factsheets in the ‘All About’ series. Download the poster from www.snh.org.uk/pdfs/education/poster/p-watervoles.pdf or contact SNH, Battleby, Redgorton, Perth, PH1 3EW



Water voles burrow



Water voles at home

Water voles are found along river banks and mountain burns and in marshes. They like steep sided earthy banks beside slow moving water, where they make lots of tunnels. These tunnels come out above and below the waterline. Their long strong front teeth can be used to take bites out of the earth as they dig out these burrows. They use their legs and feet to then push the earth out of the burrow. They also need to have lots of tall, thick, leafy and juicy plants growing along the edge of the water and in the water. The plants supply the water voles with food to eat and places to hide from predators.

Going Down!

Water voles used to be very common in lots of places in Scotland. They are now quite rare and numbers are still going down.

Why?

Any one or more of the following could have been the reason why water voles disappeared from YOUR neighbourhood.

1. Mink are really good at hunting water voles and female mink are small enough to get into water vole burrows
2. Water pollution
3. River bank plants were lost when banks were planted with commercial conifer trees
4. River bank plants are too short as they are grazed and trampled by farm animals
5. Earthy riverbanks were built over with stones and concrete.

How would you protect water vole habitats if you were a farmer or a forester?



Mink

American mink are a big problem for water voles.

Mink were brought to Britain and reared on fur farms particularly to make fur collars on coats.

Many mink escaped and they found the British countryside very much to their liking.

There were many, many water voles at that time, and they lived along rivers where mink like to live too. Unfortunately, water voles are the perfect size for mink to hunt and eat!



Describing a water vole

Read the description of the water vole on the first page and fill in the labels with a describing word or words for each one (for example 'small' ears)

Add in information about adaptations to life in the water if you can!



Words to help you: fur; whiskers; teeth; tail; ears; fingers/feet

The Watervole and me

Water vole, water vole come out to play
Here with me on the River Tay
Here I am on my little canoe
Won't you come out to play too?

Ssh! What was that I heard?
Ssh! Don't say a word!
A splash and a ripple just up ahead
A nose and a whisker, is that his head?

My, my Mr. Water vole how small you are!
Swimming along on the river so far
Oh no, you've heard me and I see you sink
Goodness me, there goes a mink!

Poor little water vole frightened so much
What a pity I couldn't just touch
As he looked so smooth with his lovely fur coat
I'd love him to come for a ride on my boat



Poem, Stories, Artwork and Drama

Read the poem opposite and the factsheet – make a list of words that could describe a water vole and where it lives

Use these words to write a simple story or poem about a water vole

Find out about the story 'Wind in the willows'

Discuss the information in the factsheet, make a list of the things which are important to water voles

Design a frieze showing a section view of a river, the riverbank and landscape

There is an activity for drama on the reverse of the Water vole poster

Can you draw and complete a food chain which includes a water vole?

Read the information in the factsheet to help you.

