



Watchtree Nature Reserve



The Birth of Watchtree Nature Reserve


defra
Department for Environment
Food and Rural Affairs

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ACKNOWLEDGMENTS

General Background and Site Description

An outbreak of Foot and Mouth disease occurred in the UK during early 2001. The outbreak included a concentration of confirmed cases of the virus at farms in northern Cumbria. In order to contain the spread of the virus, a programme of emergency culling of sheep and cattle was carried out in Cumbria, commencing in March 2001.

Initially carcasses were disposed of on the farm, either by burial or pyre, but due to public concern and environmental issues regarding the volume and time animals remained on farms after culling, alternative disposal options were sought. The alternatives were mass pyres, mass burials, existing landfills and off site rendering. Public opinion from communities adjacent to the mass pyres was such that they were discontinued. However, the remaining options were fully utilised throughout the crisis.

The rapid rate of culling that was required to contain the virus dictated that this activity plus disposal of the carcasses was not logistically achievable on an individual farm scale. It was therefore decided to centralise disposal operations to a number of strategic sites in Cumbria. These included the Distington, Flusco and Hespian Wood landfills and a dedicated culling and burial site at the former Great Orton airfield (Watchtree).

Watchtree was selected as a mass culling and disposal site, through consultations between MAFF (now part of the Department for Environment, Food and Rural Affairs (Defra)), the Environment Agency (EA) and the Army. The airfield is located close to the hamlet of Wiggonby, approximately 15 km to the west of Carlisle. The area of land within the site boundary is approximately 83 hectares (ha) of which some 50 ha have been used for burials.

Why a Nature Reserve?

As a result of an intensive round of meetings and discussions with local interested parties and Liaison Groups, a joint decision has been made to take the opportunity to restore and integrate the site with the surrounding countryside, in a manner that is more sympathetic than the situation that existed prior to the development commencing. Consequently the aim is to ensure that Watchtree is restored to a condition whereby it provides significant positive residual long-term impacts to the surrounding environment and landscape.

Objectives and Purpose

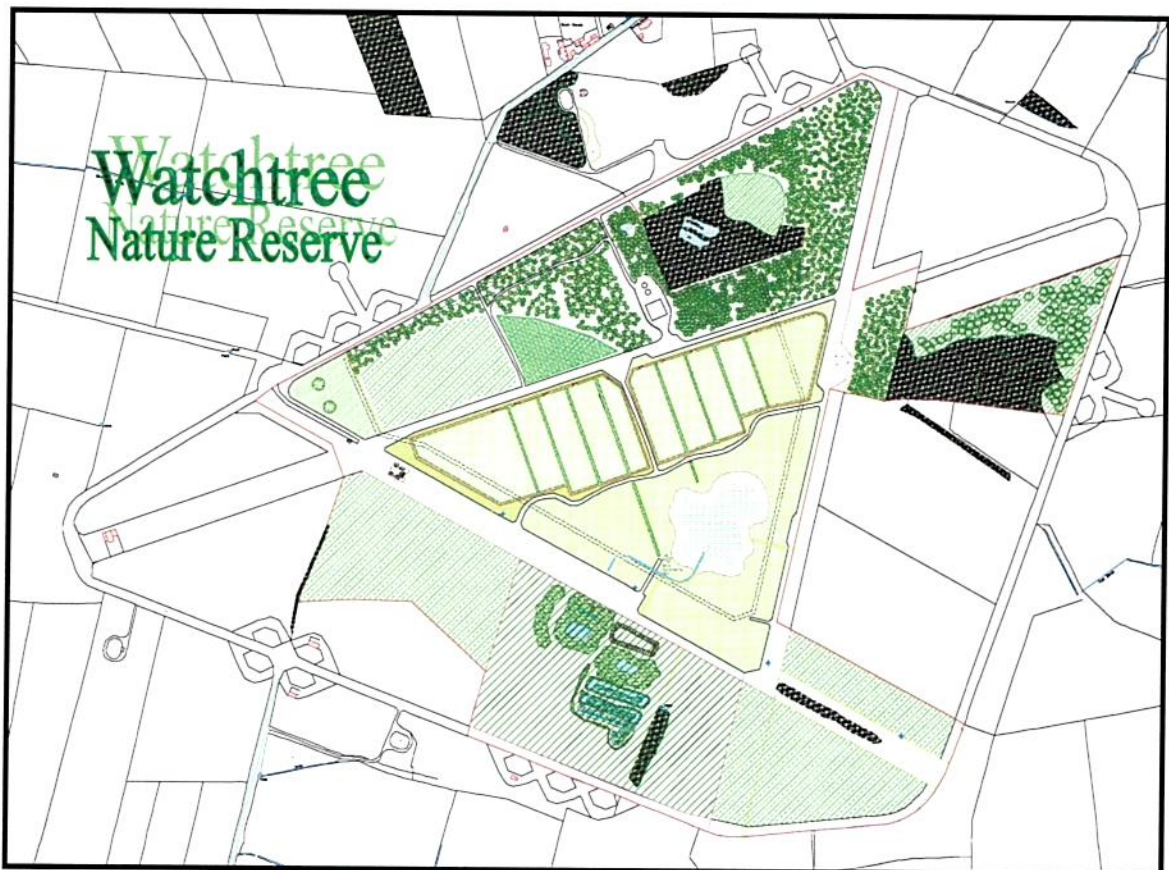
To create a haven for endangered wildlife, including red squirrels, birds, butterflies, wildflowers and newts, at Watchtree.

To develop a landscape and re-create habitats to enhance the richness and diversity of species by providing three distinct natural environments within the site boundaries by re-planting and appropriate management. The developed areas will be:-

Trees and scrubland
Meadows and hedges
Ponds and wetland

To encourage the establishment, (and in many cases re-establishment) within the site, of a wide variety of wildlife in accordance with the Cumbria Biodiversity Action Plan objectives.

To provide the local communities, educational bodies and the wider public with an important ongoing natural resource and amenity.



A map of Watchtree Nature Reserve

HISTORY OF THE WATCHTREE SITE

Geology and geomorphology of the area around Watchtree

The rocks immediately underlying Great Orton were formed in the Carlisle Basin. The basin occupies an area of approximately 40 km x 20 km. It is infilled by sedimentary strata of the Lias Group which were laid down during a period of geological time spanning the boundary between the Late Triassic and Early Jurassic, about 205 million years ago.

The Jurassic dinosaurs, made famous in recent times in Universal Studios films, appeared on the scene a little later, and the fossils found in the sedimentary strata at Great Orton are mainly of shells and various types of microfauna. The Lias Group comprises mainly fine-grained, calcareous mudstones and siltstones laid down in a shallow sea which occupied the area at this time. The uppermost strata contain richly fossiliferous beds with *Gryphaea* (oyster), bivalves and ammonites. Of these, species of ammonite provide especially good zonal fossils which allow detailed correlation. Examples of ammonites from the *Psiloceras Planorbis* subzone enable these strata to be assigned to the Jurassic. They may be compared with fauna from famous localities such as those on the Somerset and Dorset coasts.



An Ammonite from the Lower Lias found at Watchtree
Vermiceras cf. solaroides

The strata at Great Orton are poorly exposed owing to the widespread cover of till (also known as boulder clay), a superficial deposit laid down by the last glaciers of the Ice Age during the Quaternary Period (the last 2.4 million years). Successive glaciations over the land west of Carlisle left an undulating landscape with locally prominent elongate mounds known as drumlins trending west to east. During the last glaciation of the Devensian Stage the Carlisle Plain was inundated by a 2km thick ice sheet sourced from the Western Highlands of Scotland which, at its maximum some 18000 years ago extended southwards to an irregular limit between the Wash and Bristol.

From deep boreholes and seismic surveys carried out for oil exploration in the 1970s and 1980s, an interpretation can be made of the concealed deep geology of the Carlisle Basin. At Great Orton approximately 70m of Lias Group strata overlie older rocks of Permo-Triassic and Carboniferous age (dating back to 350 million years). These strata, up to 6000m thick, were laid down on Lower Palaeozoic rocks similar to those found in the Southern Uplands of Scotland in the ENE-trending Solway Basin.

Role of the British Geological Survey at Watchtree

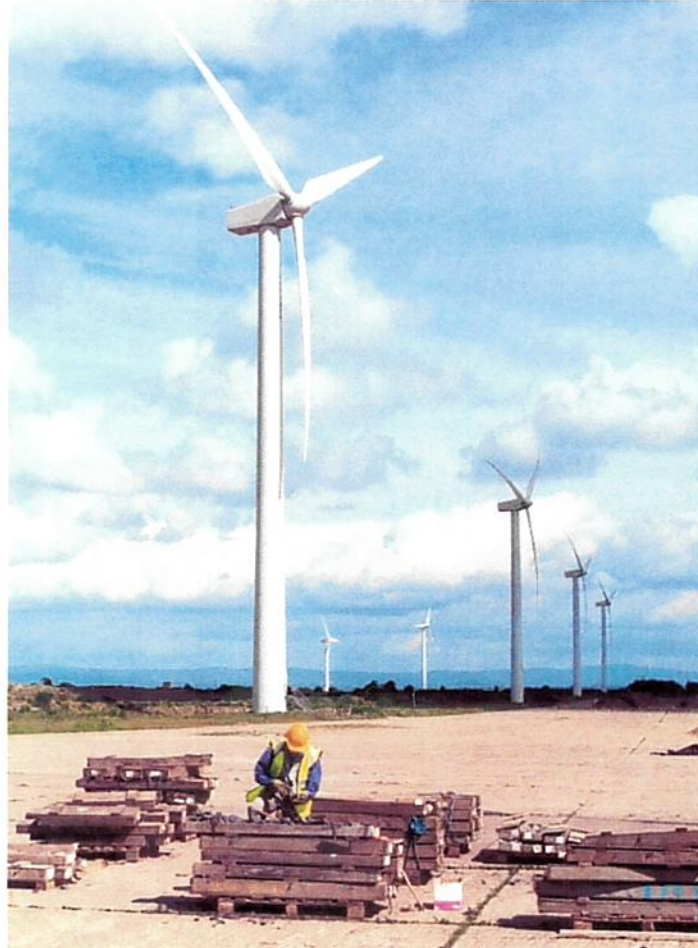
The British Geological Survey (BGS) is the United Kingdom's national geological survey responsible for providing geoscientific data and interpretation of the UK landmass and offshore continental shelf. It is a component of the Natural Environment Research Council (NERC) and receives its funding through the NERC from central government and from co-funded and commissioned sources. The BGS publishes geological maps, memoirs and reports and provides impartial advice on geology, minerals, geophysical, geochemical and engineering properties of materials to a wide range of sectors including academic, local authority, central government departments and industry.

As part of its resurveying programme the BGS is currently remapping the Quaternary and Solid geology of eastern Dumfries & Galloway and northern Cumbria. The previous surveys date from the late 19th century to the 1920s. From the latest work new maps and reports will be published over the next few years.

During the Foot and Mouth Outbreak, between March and July 2001 the BGS provided data and advice on aspects of the geology and hydrogeology of the United Kingdom to various organisations (mainly the Environment Agency and Scottish Environment Protection Agency).

In northern Britain, especially for enquires in Dumfries & Galloway and in Cumbria, a team from the BGS Integrated Geoscience Surveys (Northern Britain), based in Edinburgh, provided responses about sites that had been identified as possible burial sites for culled livestock. Geological information is essential to understand the near surface groundwater regime and assess the risk for groundwater contamination. The information was gathered from a variety of sources including BGS maps, reports and memoirs together with site investigation data such as borehole records. Information reported included the lithology, sequence and thickness of the Quaternary deposits and the nature of the Solid geology such as lithology, bedding, joints and faulting.

Recently BGS was provided with a selection of cores from the 71 boreholes put down in 2001 at Great Orton Airfield (Watchtree) as part of a detailed site assessment. BGS intends to log these cores and examine the preserved fossils as part of a study of the Lias Group strata. In turn this study will provide a better understanding of the regional geology of northern Cumbria to be published in a new edition of the BGS 1:50000 scale geological sheet 6E (Annan) and accompanying reports.



A member of the British Geological Survey team examining borehole core samples at Watchtree.

© British Geological Survey

Why “Watchtree”?

Prior to 1942, the land now occupied by Watchtree Nature Reserve, used to be Watchtree Farm, farmed by Robert and Irene Timperon.

Five kilometres to the north of the farm (near Burgh-by-Sands), is a field called “Watch Hill”, which at a height of 21 metres above sea level, overlooks the Solway Firth. In this field there used to be a large tree, the “Watch Tree”, that was used during the 15th and 16th centuries as a tower to give warning of raids from across the Solway by the Scots. These frequent raids by the Scots, which devastated the parishes adjoining the Solway, gave rise to the fortified style of parish churches in the area.

Watchtree Farm, at 71 metres above sea level, overlooks Watch Hill, and also affords views of the Solway Firth. It is reputed that at Watchtree Farm, two tall trees were also used as watch towers to give local parishes notice of Scottish raiders. These trees were felled during the construction of Great Orton Airfield in 1942.

In the creation of Watchtree Nature Reserve, we are replacing these two large trees (Scots Pine and Ash) at the entrance. These 6 metre high trees are due to be planted during December 2002.



An artist's impression of Watchtree Nature Reserve by George Kennedy

Great Orton Airfield

During the 1930's, Sir Alan Cobham was tasked by the Air Ministry to do an aerial survey of England and Wales, with the aim of identifying possible sites for development as airfields. The onset of World War II saw the huge expansion of military aviation and RAF Wiggonby was planned for the site.

Possible confusion with airfields of a similar name resulted in the name change to RAF Great Orton, which was built as a satellite to RAF Silloth, and opened in June 1943.

The first unit to move to the airfield was 55 OTU from RAF Longtown, with Hurricanes, on the 20th of October 1943. They stayed until May 1944. Wellington aircraft of 6 OTU from Silloth were also occasionally detached here during this period. On the 7th of April 1944, a Typhoon Conversion Squadron, parented by the Tactical Exercise Unit at RAF Annan, formed up at RAF Great Orton.



Hurricane P3039 of 55 OTU, the first unit to use Great Orton Airfield
© J. Huggon

Towards the end of 1944 a number of bombers (mainly Lancaster's) were diverted to Great Orton after carrying out raids on Germany. On 27th of August twelve Lancaster's landed after carrying out the first raids on Königsberg, capital of East Prussia, less than 100 miles from the Russian front line, involving a round trip of around 2000 miles.



A Lancaster Bomber similar to those that landed at
Great Orton Air Field in 1944
© RAF

The airfield was also host to many detachments from Coastal Command units such as 281 and 282 Squadrons (Air Sea Rescue), flying search missions with Warwicks over the Irish Sea.

RAF Great Orton was put under 'Care and Maintenance' on the 16th of April 1945 and used for bomb storage by 249 MU until 1952, when the RAF withdrew completely.



The remains of the Control Tower built during WWII

More recently, one of the runways was used by the North West Gyroplane Club, who now use Kirkbride Airfield as a base.



A gyrocopter landing at Great Orton Airfield - © R Savage

Great Orton Windfarm

From 1992 Watchtree has also been used as a wind farm by Cumbria Wind Farms Ltd., initially with ten 300kW wind turbines. These were replaced in 1999 with the six larger, and more technologically advanced, 660kW turbines that now occupy the site.

The turbines are situated alongside the southern runway, and provide sufficient power to supply nearly 2000 homes with electricity. Each turbine is 45 metres high and fitted with three blades, with a diameter of 47 metres.



The wind turbines at Watchtree protect our environment by saving emissions of 8400 tonnes of Carbon Dioxide and 130 tonnes of Sulphur Dioxide every year.

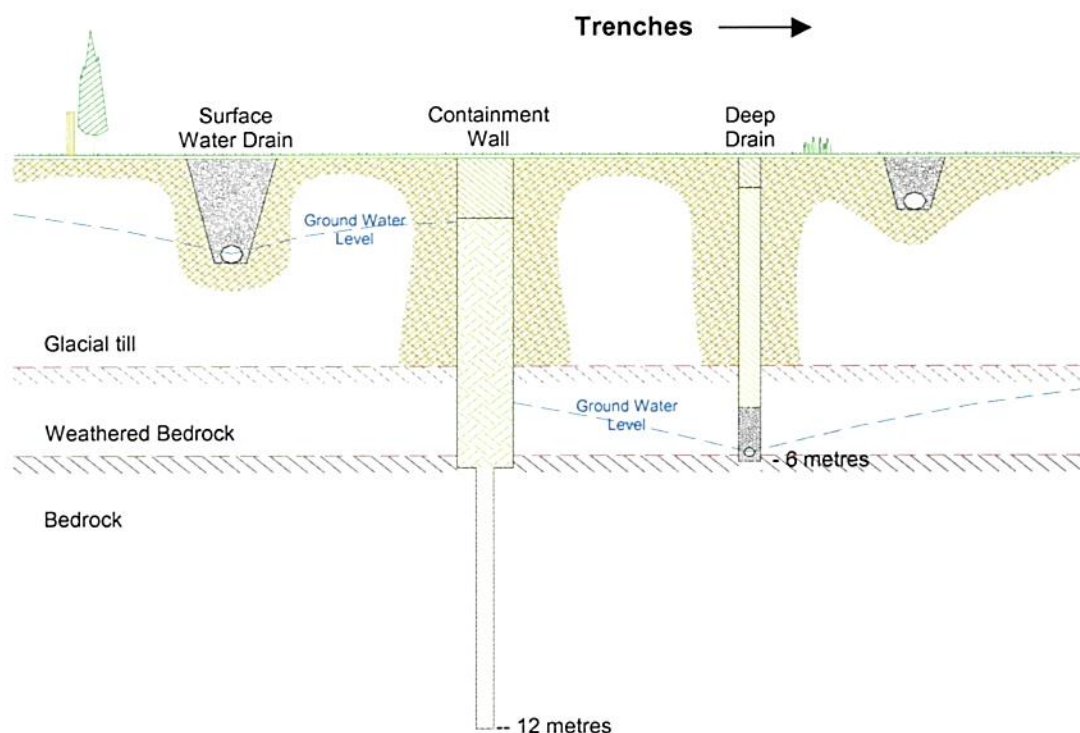
Foot and Mouth Burial Site

In total 466,312 carcasses, comprising 448,508 sheep, 12,085 cattle and 5,719 pigs were buried between late March and mid May 2001 in 26 trenches.

The potential for fluids escaping from the burial trenches to contaminate groundwater and surface water bodies was recognised early in the burial process. Although the host rock underlying the glacial till is considered by the Environment Agency not to be a significant water bearing medium, it does contain isolated fractures that could potentially allow a mixture of fluids to migrate off site. As a result, a scheme of works to protect these resources was agreed with the Environment Agency, and implemented.

Containment Wall and Deep Drain

A containment wall, consisting of a low permeability naturally occurring clay (bentonite) and cement barrier, has been designed and constructed to cut off these fractures and to impede groundwater migration from the burial area. The wall has been excavated through the glacial till, around the area in which the trenches lie, and into the weathered/fractured bedrock and subsequently backfilled with bentonite-cement slurry.



Containment Wall and Deep Drain

The wall has been constructed as a closed loop around the entire 2500 m perimeter of the burial area to a depth of approximately 12m. This has involved the drilling of 300mm diameter boreholes at 600mm centres to full depth, which have been grouted to infill any water bearing fractures within the rock. Subsequent to this a 600mm wide trench has been excavated to a depth of approximately 6m along the line of the boreholes and filled with bentonite-cement slurry.

In association with the containment wall, a deep drain system has been engineered to allow for the collection and subsequent treatment of groundwater within the confines of the containment wall. The deep drain is located at a depth of approximately 6m and lies 6m inside the line of the bentonite-cement wall. It is designed to prevent the build-up of groundwater on the inside of the wall, and thus assist in preventing the migration of fluids out of the site.

The combination of the containment wall and the deep drain provides a high degree of control on the migration of fluids from the site, thus significantly minimising the long-term environmental risks from the burials.

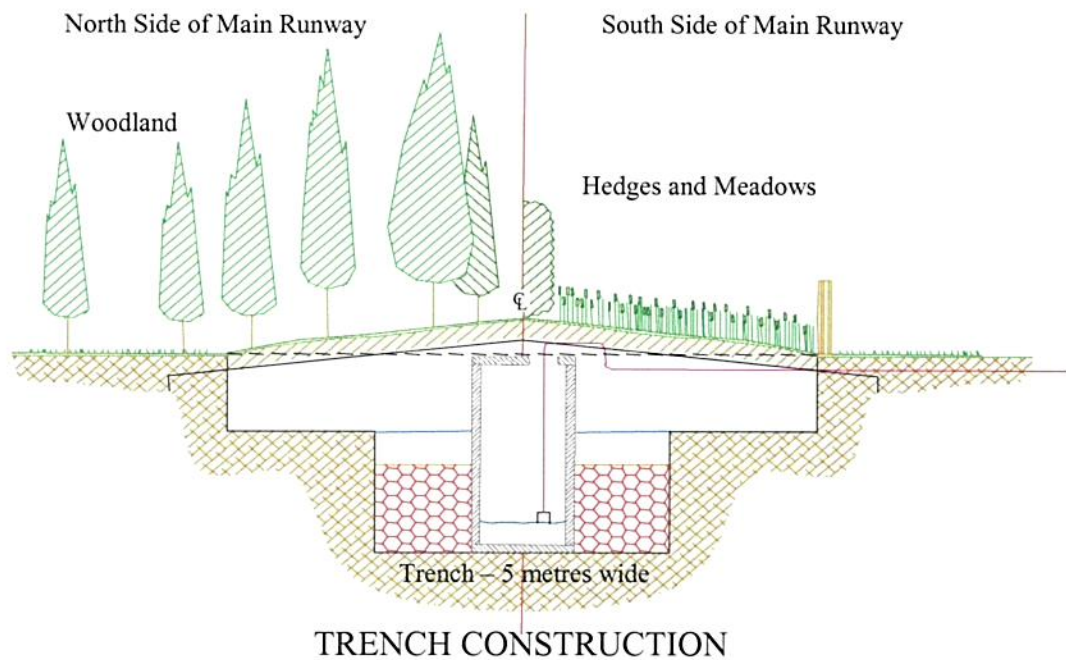
Fluid Removal from the Trenches

Rapid removal of the liquids from the burial trenches has been the key requirement of the fluid management strategy employed at Watchtree. From an engineering viewpoint this ensures a more rapid settlement of the trench surfaces allowing for quicker remediation, and reduces the volume and pressure of fluids in the trenches, so the potential for penetration of the fluids into the surrounding groundwater regime is significantly reduced.

A collection system has been fitted to each of the trenches with a drainage and pumping system that takes the fluid directly to storage tanks for removal and subsequent off site treatment. The amount of fluid to be removed from the site was initially estimated with the assistance of veterinary and forensic pathologists and actual quantities removed have been in line with these predictions.

Odour arising from gases from the burial pits is buffered by a 200mm layer of burnt lime, sandwiched in between the low permeability clay cap that covers the pits. In addition the lime acts as a capillary break to prevent fluids rising to the surface.

The burial trenches were capped with a geotextile membrane during the summer of 2002. This has effectively sealed the trenches, and hence reduces the infiltration of rainwater into them.



Surface Water

A significant part of the engineering works has been the control of surface water (rainfall) runoff. Rain that falls on the site is currently collected in several purpose made lagoons and any suspended material (silt) is allowed to settle prior to discharge into nearby watercourses. Minimising the infiltration rates into the burial trenches is an important factor in reducing the quantities of fluids produced.

To monitor the environmental impact, a significant programme of drilling and installation of monitoring wells was undertaken across the site. In addition all surface water features considered to be at risk both in and around the site have been monitored. A regular sampling regime of these waters has been undertaken to test for contaminant indicators. This is an on-going process that will continue for the foreseeable future. Additional monitoring includes climate, odour, the presence of gas, and the volumes of fluids removed from the site.

To date, whilst there has been a very minor degree of migration of fluid from the burial trenches within the site, groundwater and surface water bodies outside the site have not been affected.

Reed Beds

The development of a long-term, sustainable fluid management strategy for the site has been a priority from the outset. Detailed discussions between defra, site management, engineers and the Environment Agency were held to determine the most appropriate solution for Watchtree.

The use of reed beds to treat the groundwater and polish the surface water was chosen as a preferred option as this is a relatively low maintenance, low resource input treatment method. Additionally the treatment method fits in well with the objective of 'greening' the site.

The reed beds are designed to reduce the higher nutrient levels in the groundwater by promoting normal biological processes. These rely on close contact between the water and the plant roots, and contact with oxygen and bacteria that rests on the gravel beds.

The use of a reed bed treatment system to allow groundwater to be treated on site has never before been used in a similar situation. Not only is the design unparalleled, but it is extremely robust and variable in operation and very user friendly, with the entire system fed by a gravity feed from the storage tank.



An aerial view of the reed beds under construction

The final polishing stage of the process is a very large constructed wetland with four ponds of varying depth. This has been designed to create ideal habitats for birds and amphibians, and in particular the Great Crested Newt. A platform built over the shallowest part of this wetland will also be used to assist with environmental education classes for local school and youth groups.

The Watchtree Centre

The Watchtree Centre was completed on the 4th of July 2003. It is a multipurpose building, constructed in a style that is sympathetic to rural Cumbrian architecture. The building, designed by local architects and built by a local firm, consists of a structural timber frame, obtained from sustainable sources, with a sandstone and Tyrolean finish to the external walls.

The building houses two main functional areas: the management offices and a large multipurpose area. The latter is equipped with conference facilities, and a range of multimedia and visual displays.



An environmental education programme is being developed for local schools, and this multipurpose space will provide a valuable educational and research centre for them. A number of tertiary education facilities are also interested in using the site for practical ecological work.

The displays in this area cover the geology, natural history and the usage of the site following the devastating Foot and Mouth disease outbreak of 2001. Other displays detail the restoration of the site and the creation and development of the nature reserve, with a large collection of photographs depicting the return of wildlife.

The management team has been responsible for the restoration of the site into a nature reserve, and is currently responsible for both the daily running of the site and the ecological management of the developing nature reserve.

The Involvement of the Environment Agency

The site was authorised for the disposal of carcasses under the Groundwater Regulations of 1998. A prior risk assessment of the site was undertaken by the Environment Agency in order to determine that the risk to surface and groundwater was minimal.

The groundwater authorisation issued by the Environment Agency set conditions which:

- Permitted the disposal of animal carcasses (500,000 in total)
- Required the holder to take all practicable measures to minimise adverse environmental impact of the disposal
- Defined the area where disposal could take place
- Required the holder to install site containment measures
- Required the holder to undertake monitoring of ground and surface waters, keep records and submit them to the Environment Agency
- Prohibited the burial of any cattle born before 1st August 1996
- Required the holder to keep records of the animals disposed of at the site

Under the groundwater regulations the Environment Agency is required to inspect facilities which are authorised. The Environment Agency has maintained a high regulatory presence at the site throughout, and, for the first six months, was in permanent attendance. In regulating the site the Environment Agency fulfilled the following roles:

On site supervision of activities and operators

The Environment Agency carried out inspection of the activities taking place at the site, such as site construction, disposal operations, decomposition fluids, surface and ground water management and site monitoring, to ensure that the activities complied with the conditions of the groundwater authorisation.

Pollution Prevention and Control

In addition to supervising activities and ensuring the compliance with the authorisation conditions, the officers of the Environment Agency were also on site to provide pro-active guidance and support on general site pollution prevention and control measures. These included the bunding and installation of impermeable surfaces for disinfectant areas, the installation of surface water management systems, containment of chemicals and fuels and other measures associated with large engineering projects.

Design and Construction Methods

As required by the groundwater authorisation, the design and construction of on site facilities, such as the site containment measures, had to be agreed with the Environment Agency before being constructed. Therefore, the Agency was involved in negotiations with the operator and their agents over the standards and methods of construction used at the facility.

The Environment Agency still regularly inspects and monitors surface waters at and around Watchtree.

The Involvement of the Local Community

From the outset many local people had concerns about these operations and about the long-term effects of living close to such a large carcass burial site. Following a public meeting, a Liaison Committee was formed, consisting of residents and Parish Councillors from Aikton, Great Orton, Kirkbampton and Thursby, representatives from Defra, the Environment Agency, Cumbria County Council, Allerdale District Council and Carlisle City Council.

The Liaison Committee has successfully operated now for more than two years, dealing with site, community and planning issues and long-term site restoration. They have been instrumental in having the site renamed 'Watchtree', as well as being involved in operational issues and in the long-term planning of the site. They also compile and distribute a monthly newsletter to every home in the four parishes to keep the local population updated on site activities and development.

Open day

An open day was held on 13th November 2002 at Great Orton Village Hall, to inform the community about the aims of the Nature Reserve. Engineering, geology and ecological experts were on hand to explain aspects of the site to the public, and to answer any questions that were asked. This was attended by approximately 450 people, including 220 children from six local schools. At this event, brochures and an informative booklet were distributed, and a competition launched for local school children to design a logo for the reserve.



Photographs from the Open Day held in Great Orton Village Hall

Logo Competition

This competition launched at the open day in November 2002, attracted 230 entries, and was won by a school girl who had lost her pet lambs to the Foot and Mouth outbreak. The winners of the competition and their schools were presented with certificates and prizes by the Liaison Committee.



The winner with her certificate at a special assembly at school.

A local school girl designed the winning entry of the logo competition.

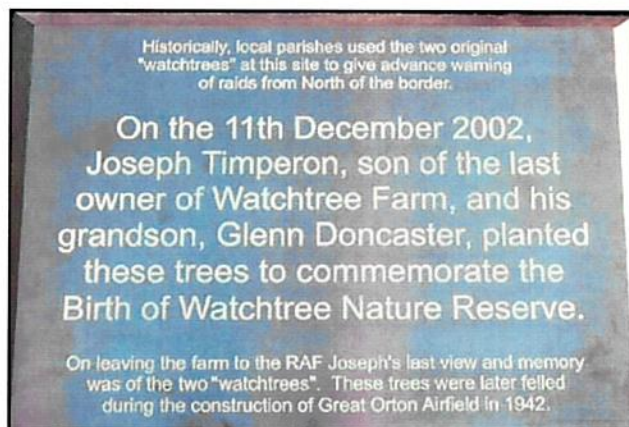
She called her logo "The Tree of Everlasting Life" and explained it's design as follows:

"The tree of everlasting life symbolises all the animals that were killed and buried at Watchtree. The roots take the goodness from the soil and when the tree flowers, the animals are reborn and their memory will live on forever"



The Tree Planting Ceremony

Two mature "Watchtrees", one Ash and one Scots Pine, were planted at the site entrance in December 2002.



This not only reflects the history of the site (two large trees were reputedly used as watch towers to give early warning of approaching Border Reivers), but also the memory of Mr J Timperon, the son of the last owner of the farm in 1942. The original trees were felled during the construction of Great Orton Airfield.

The Cumberland News Countryside awards

The Liaison Committee entered Watchtree into the Cumberland News Countryside Awards of 2002. These awards were divided into 6 categories, each with five sections and open to entrants from most of Cumbria as well as South West Scotland. Watchtree was entered into the awards under the Environment Project of the Year section of the Environment Category. The strongest competition in this section was from Greenside Mines in the Lake District National Park. This project, funded by the Northwest Development Agency and the Environment Agency, secured the tailings dams of the former lead and silver mine, and prevented a possible, catastrophic pollution of Ullswater lake. Watchtree Nature Reserve was nominated as a finalist in this section along with Greenside Mines and the Northern Viaduct Trust in Appleby.

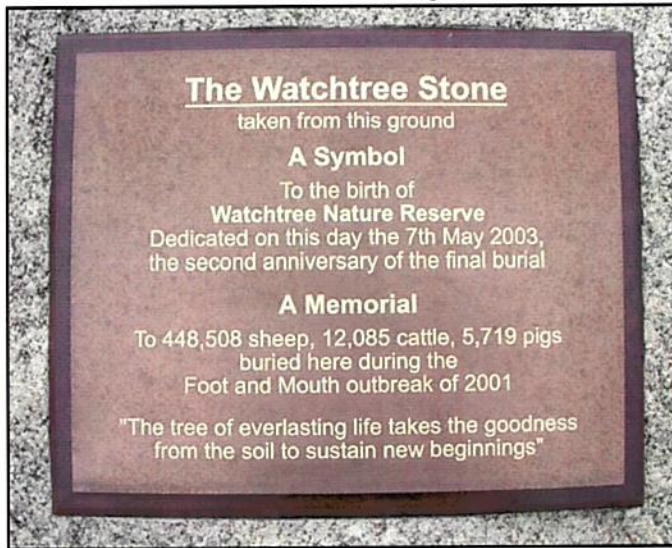
At an awards ceremony in Carlisle on Friday 24 January 2003, Watchtree Nature Reserve was named as the winner of the Environment Project of the Year Award and also announced as the winner of the Environment Category of the Awards.



A member of the Liaison committee with the trophy received for the Cumberland News Countryside Award's Environment Project of 2002. The trophy was presented to the site by John Craven from the BBC's Countryfile programme.

The Memorial Service

The Liaison Committee organised and held a Memorial Service at the site entrance on the 7th of May 2003.



This date coincided with the last day of burials at Watchtree during the Foot and Mouth crisis of 2001. The service was attended by more than 400 persons, including some farmers who, not only lost all their stock, but in some instances lost bloodlines that had been in their family for generations. The multi-denominational service not only provided farmers with the opportunity to grieve and remember their lost animals, but

also commemorated the Birth of Watchtree Nature Reserve.



Local people bow heads in reverence during the Memorial and dedication Service.

The Liaison committee are also developing a website covering the entire history, restoration and ecological development of the Nature Reserve. The website address www.watchtree.com , and is currently added to on a daily basis.

CREATION OF A NATURE RESERVE

Introduction

Since the Second World War, increasing demands have been made on our land both for increased housing and for increased food production. These factors have resulted in the widespread loss of natural areas able to support a wide range of wildlife. Consequently, many species associated with farmland, such as the Grey Partridge, have decreased, or even, in the case of the Corncrake, become locally extinct.

Watchtree Nature Reserve has been designed to create a range of habitats, with the aim of supporting the widest range of wildlife possible.

In designing the reserve, the concerns of the local communities and wider farming community have been fully incorporated. The strongest of these concerns was, that access by people and grazing by animals, over the graves of the buried animals must be minimised or prohibited. To achieve this, the northern trenches have been planted with trees and will be allowed to develop into woodland, while the southern trenches have been planted as meadows with fenced hedgerows preventing access over the trenches themselves.

During the restoration of the site, and the creation of the Nature Reserve, the following have also been achieved:-

- The creation of a large pond and wetland to attract breeding populations of endangered birds and amphibians.
- The re-profiling of the entire site to reflect the original profile as closely as possible.
- The reduction of width of the main runway to increase the conservation area and limit the visual impact of the runway.
- The erection of rabbit and fox-proof fencing to afford the maximum protection to nesting birds and the wildflowers.



One of the many species that will benefit from the creation of
**Watchtree
Nature Reserve**

A Tree Sparrow - © Liz Still

The Different Habitats

Meadows and Hedges

The meadows at Watchtree Nature Reserve have been seeded with a carefully selected mixture of grasses and wildflowers to create species-rich grasslands. In the United Kingdom, areas of this nature have declined by up to 97% over the last 50 years.

These meadows are of importance for breeding birds such as Redshank, Curlew and Yellow Wagtail. They are also important as feeding areas for insects, insect-feeding bats and Brown Hares.

More than 3.5km of hedges were planted at Watchtree during 2002. These hedgerows will provide protection and nesting sites for birds such as the song thrush and the grey partridge.

Woodland and Scrubland

At Watchtree Nature Reserve the woodland habitats will be managed as prime habitat for the Red Squirrel, providing the diverse food sources required by the species, while being less than ideal for the Grey Squirrel. Several tree species that are favoured by the Red Squirrel, such as Scots Pine and Silver Birch, will be planted on the reserve.

More than 58,000 trees were planted at Watchtree Nature Reserve during November and December 2002.

Ponds and Wetlands

Ponds and wetlands support a wide variety of wildlife, but are under severe pressure due to increased demands for urban and industrial development, farming demands, and the introduction of fish to the ponds.

A large clay-lined pond and extensive surrounding wetland has been created at Watchtree Nature reserve. This pond has been designed to maximize the shore area by creating shallow muddy areas, and will be managed alongside the existing pond at Watchtree, to exclude fish and to create a series of ponds and wetlands to attract amphibians, insects and wading birds.

Some of the Targeted Animals

The site has detailed management plans which should be beneficial to over 30 species. Below are some examples of species which are expected to colonise and thrive at Watchtree Nature Reserve.

The Great Crested Newt

The Great Crested Newt is one of the six amphibian species native to the United Kingdom, and reaching up to 16cm in length, is the largest of the three species of newt found here.

It has declined over much of its western European range, such that it is now recognised as threatened in eleven countries. The relatively large population in the UK is of great conservation significance, but their population is declining rapidly as a result of the draining of breeding ponds (often indirectly through the lowering of water tables), introduction of fish to breeding ponds and fragmentation of their feeding areas on land.



Young Great Crested Newts - © Liz Still

Great Crested Newts require ponds for breeding, but outside the breeding season they need terrestrial habitats associated with ponds, for foraging and hibernation.

During the winter, Great Crested Newts hibernate in frost free holes in the ground, before returning to their breeding pond to court, mate and lay eggs. The eggs are laid singly in the folded leaves of water plants and hatch into legless larvae. It takes about three months for the larvae to develop into young newts, which then leave the water. For up to three years the newly emerged animals generally stay away from their birth pond, whilst becoming sexually mature. Great Crested Newts can live up to 18 years in the wild.

The pondscape created for the newts will also provide ideal habitat for a range of other species including damselflies, dragonflies, frogs and toads. It will also produce large numbers of flying insects suitable for feeding swallows and bats.

The Red Squirrel

The globally threatened Red Squirrel has declined over the past 50 years in Britain due to loss and fragmentation of woodland habitat but more importantly due to competitive exclusion by the introduced (American) Grey Squirrel.

The Red Squirrel is now restricted to Scotland, Cumbria, Northumberland, County Durham, West Lancashire and Merseyside and small populations in Norfolk, Isle of White, North Wales and three small islands in Poole harbour. The Grey Squirrel has now replaced the Red Squirrel through most of its British range. The two squirrel species compete for the same food source. The Grey Squirrel is better adapted to take advantage of broad leaf and mixed woodland unlike the Red Squirrel, which is well adapted for coniferous woodland.

The population of Red Squirrels on the Solway Plain lives in small areas of fragmented woodland. The provision of new suitable woodland at Watchtree will help link existing populations at Orton Moss and Finglandrigg. Both of these sites are existing reserves and are managed in order to secure the long-term presence of the Red Squirrel on the Solway Plain.



A young Red Squirrel - © Mark Witheral

Red Squirrels need a consistent and diverse food supply consisting of tree seeds, nuts, berries, buds, shoots, flowers, lichen, fungi and, occasionally insects. The autumn and winter seed harvest is extremely important both for over winter survival and for breeding success the following year. Red Squirrels need to increase their body weight by 10% in order to survive the winter and maintain good condition for breeding.

Mortality in red squirrels is high, with five out of six young dying in their first year. They can, however, live for 4-7 years in the wild. Causes of mortality include lack of food, disease, predation and road deaths.

The Marsh Fritillary

The Marsh Fritillary is a very attractive medium sized single-brooded butterfly. The UK is a major stronghold for this species, which is declining across Europe. However, even in Britain, its range has declined by more than 60% over the last 150 years.

Colonies are estimated to be disappearing at a rate of over 10% per decade and it has been lost from the entire eastern half of Britain. In the last 15 years there has been a 50% loss of marsh fritillary colonies in Cumbria.

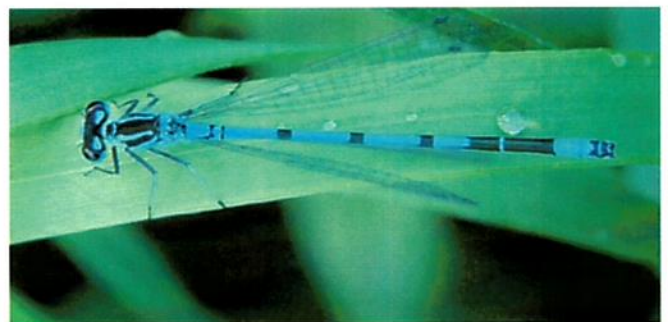


A Marsh Fritillary Butterfly - © Frank Mawby

At Watchtree Nature Reserve we are creating over 11 hectares of species-rich grasslands to attract numerous insect and butterfly species and, hopefully, this beautiful and vulnerable species.



A Small Copper Butterfly
© Liz Still



An Azure Damselfly - © Liz Still

The Song Thrush

The Song Thrush is brown above and buffish-white beneath, with very dark brown spots on the breast. They forage under trees or close to field edges, with their main food item being earthworms and, at certain times of the year, snails. They nest in bushes or hedges.

This species has shown a decline of nearly 70% over the last 25 years, largely due to changes in agricultural practices away from spring-sown to autumn-sown crops, which has resulted in the reduction of open areas needed by the birds to forage. This has been compounded by the conversion of invertebrate-rich permanent pasture to intensive arable cultivation and the loss of field margins. In autumn, song thrushes eat large quantities of hedgerow fruits, but this resource has also declined severely through the loss of hedges.

The invertebrates that Song Thrushes feed on are mostly taken from close to the surface of damp, nutrient rich soils. During periods of dry weather the surface layers of soil become desiccated and most invertebrates withdraw below the reach of song thrushes.

The habitats being created at Watchtree Nature Reserve are ideal for the Song Thrush as they provide large areas suitable for their feeding habits, and protected hedgerows and woodland edge for them to nest in.

The Grey Partridge

The Grey Partridge is a ground bird that prefers relatively short grass or crops with some open patches and some taller, denser cover such as grassy hedge bottoms for nesting.

The population of Grey Partridge in the United Kingdom has declined by over 50% in the last 25 years, largely due to the loss of nest sites and reduced food supplies.

The combination of hedgerows, fields with broad margins and areas of denser cover around the wetlands at Watchtree Nature Reserve will provide ideal nesting and feeding habitat for this threatened species.



A Grey Partridge

The Lapwing

The Lapwing is a graceful bird with its fine long crest and glossy iridescent plumage. It lives on fields, pastures and marshes, and at a distance the appearance is more black and white.

Lapwings nest in a slight depression on bare ground, in a field, pasture or any open place where the vegetation is short. They also require a rich source of invertebrate food for the chicks from nearby wetlands.



A Lapwing - © Richard Cope

This species has seriously declined over recent years with a spectacular decline of 49% in the period of a decade. This is largely due to intensive farming methods and farming operations such as rolling and chain-harrowing, which destroy their nests. On pasture, trampling of eggs by stock is always a threat and this is exacerbated by high stocking densities.

At Watchtree Nature Reserve, the large areas of grassland, with the nearby wetlands, will be an ideal nesting site for the lapwing.

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