

# **Baseline Ecological Survey & Historic Land Management Report of Steep Fields, Christow**

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Commissioned by  
Christow Community Land Trust

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## **1. Introduction**

Following the successful grant application to Dartmoor National Park Authority, the Christow Community Land Trust (CCLT) commissioned a baseline ecological survey to be completed of a site comprising a meadow, scrub and a series of woodlands on the edge of Christow, called 'Steep Fields'.

Whilst this report was in the process of being completed, access to the site for the general public was been granted by the landowners, along with the creation of a footpath called 'Archers Walk'. This path follows the boundary of the site and links up to the adjoining public footpath on the west of the site.

This report will establish a series of maps of the habitats on site and start to build up a species list. Both can be used to help inform and educate people on the biodiversity and conservation of the site.

In addition to this, it will identify and evidence the changes to the land management and resulting habitat on site, over the past 100 years. By being able to see and understand what has happened over this time, readers and site visitors will be able to visualise what may occur on the site over the next 100 years.

It is hoped that this will provide people with an example of how land, which has seemingly always been grassy meadows can, under natural processes and given sufficient time, revert to a different habitat.

Much attention has been given recently to climate change and the predictions of resulting climate and ecological breakdown. One of the tools for mitigating against this is renaturalisation of farmland to natural habitats, sometimes referred to as 'rewilding' or 'wilding'. This site is perhaps ahead of the trend and has been undergoing its own return to nature and may offer an excellent local example of where land can be of valuable resource to both wildlife and local people after a history of farming and production through abandonment of farming/land practices allowing space for nature to move in.

## **2. Objectives of 2020 survey**

The main aim of the survey is to map the habitats on site and record any specific species of interest. This will establish a baseline of what species are present on site which can be used to inform and educate those people who visit the site in the future.

The survey also aims to identify, and evidence, historic changes to the land management and habitat on site, over the past c.100 years. This will enable readers and visitors to picture how habitats change over time and to give an idea as to what may occur on the site over the next 100 years.

This information is intended to build a greater sense of understanding of the natural world with site visitors, therefore increasing people's sense of ownership and connection with it. In turn, hopefully, this will foster a greater care and action on the individual's behalf to look after the natural world and so address the challenges being caused by the climate and ecological breakdown.

### **3. Methodology**

The report is split into two separate areas. The ecological baseline survey, showing habitats and species present today, and the presentation of evidence documenting the historic land management changes and the effects this has had on the habitats and species present. Below is the methodology outlined for each of these separate parts of this report.

#### **Baseline Ecological Survey**

Firstly, a desktop mapping exercise was carried out to gather the most up to date aerial photographs and satellite images of the site, and its surrounding areas. These maps were then taken out on site and ground-truthed whilst being mapped with GPS. Alongside this a data search online for ecological records for the site was carried out to identify what species were already known to be present. This formed the building blocks of the species list for the site.

A walk through of all the main habitats was completed enabling a species list to be drawn up for each habitat. Any interesting species discovered were recorded and mapped using GPS and records sent to the Devon Biodiversity Records Centre using the iRecord mobile phone app.

10 Quadrats were placed in a 'W' pattern across the meadow and all species of grasses and wildflowers which fall within the quadrat were recorded. The frequency of the different species was then interpreted using the DAFOR scale. The locations of the quadrats were mapped as approximates.

A number of felt mats were distributed at various points around the site in early spring to encourage any reptiles on site to take refuge underneath them. These felts were checked on a monthly basis to help to establish knowledge of the reptile and amphibian species present on site.

To help capture the condition of the habitats on site at the time of the ecological survey, a series of fixed point photography locations was established and the first series of photographs taken. These were taken using an iPhone camera and will be taken in such a way as to enable the same photo to be replicated in the future to monitor slow and gradual change in the site and its habitats.

All of the data and images gathered from the above survey methods were then pulled together and written up as a single report, so providing the first baseline survey for the site.

#### **Historic Land Management Report**

Via a series of online archive websites, a catalogue of historic maps, aerial photographs and satellite imagery were collated and pulled together to show pictorially the changes that have happened to the habitats on Steep Fields over time, as its land management has changed.

Using local historic photo websites and talking to people in local history societies, old photographs of Steep Fields have been included to further provide evidence and a timeline of the changes that have taken place.

Lastly, by speaking to the landowner and discussing in detail with them the land management practices which took place on site, a chronological report of what has happened and when changes took place has been documented. This will then enable predictions of what may happen to the habitat if unmanaged for the next 100 years.

## 4. Results

### Ecological Results

#### Desktop records search

A full species record search for the site was carried out via the National Biodiversity Network website. Searches for the site itself, as well as the surrounding area with radius' stretching from 0.5km to 10km. The results can be seen in Table 1.

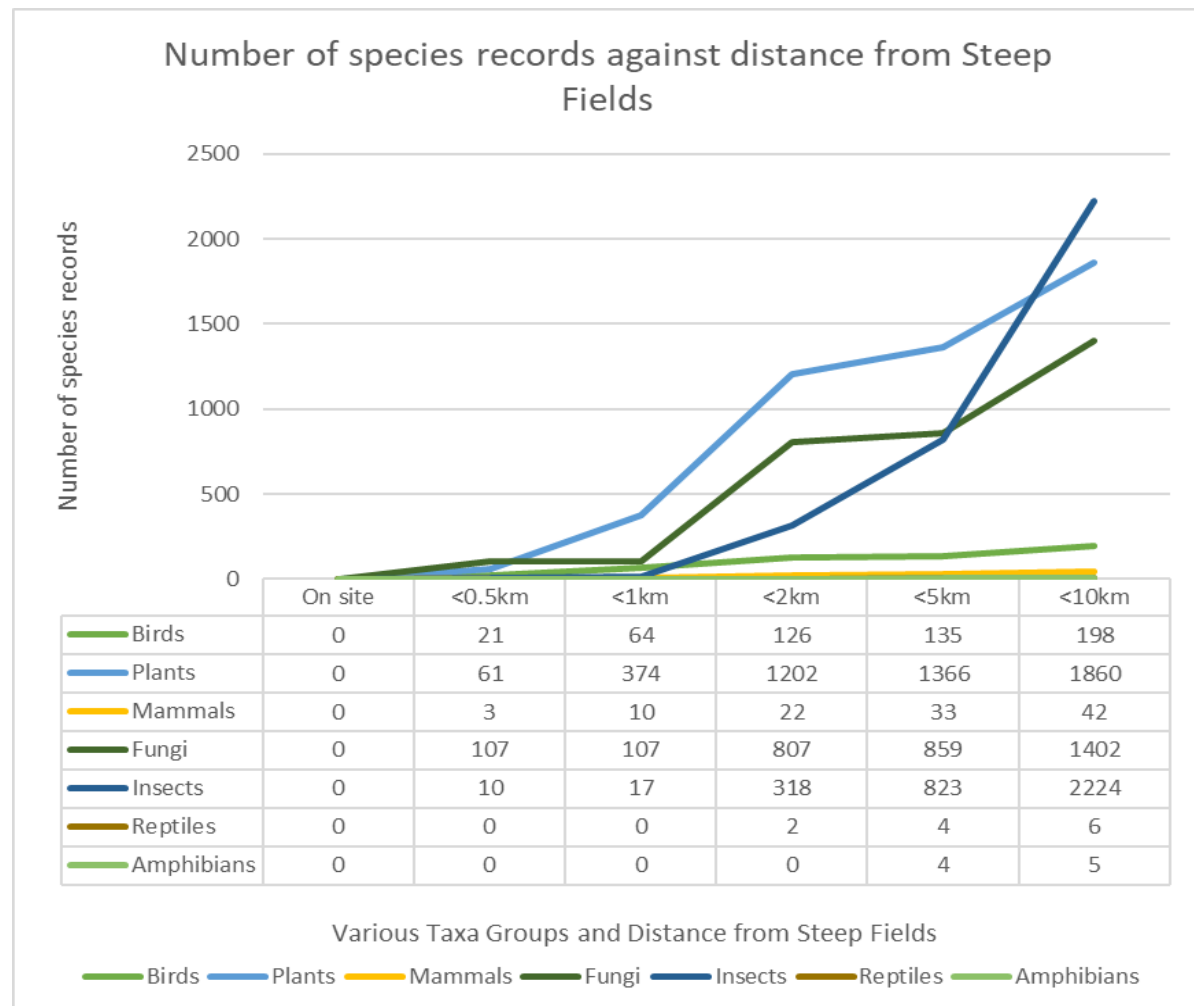


Table 1. Various taxonomy group records in numbers against distance from Steep Fields. ©NBN Database 2020

## Site records

According to the National Biodiversity Network website there are no records for the site.

### Records for <0.5km

Records exist for all the target taxonomy groups except reptiles and amphibians. Records of interest for species which would have a territory that would likely encompass Steep Fields within it include badger (*Meles meles*), soprano pipistrelle (*Pipistrellus pygmaeus*) and glow-worm (*Lampyrus noctiluca*). Of note are also 21 species of common birds and 61 common plant species which are all likely to be present or using Steep Fields.

### Records for <1km

Records exist for all the target taxonomy groups except reptiles and amphibians. Records of interest for species which would have a territory that would likely encompass Steep Fields within it, in addition to those mentioned above, include hedgehog (*Erinaceus europaeus*), brown long-eared bat (*Plecotus auritus*), greater horseshoe bat (*Rhinopholus ferrumequinum*), lesser horseshoe bat (*Rhinopholus hipposideros*), nightingales (*Luscinia megarhynchos*) and swift (*Apus apus*). Of note are also 64 species of common birds and 374 common plant species, many of which are likely to be present or using Steep Fields.

### Records for <2km

Records exist for all the target taxonomy groups except amphibians. Records of interest for species which would have a territory that would likely encompass Steep Fields within it, in addition to those mentioned above, include whiskered bat (*Myotis mysticanus*), Natterer's bat (*Myotis nattereri*), red squirrel (*Sciurus vulgaris*), slow worm (*Anguis fragilis*), grass snake (*Natrix helvetica*), cuckoo (*Cuculus canorus*), Cirl bunting (*Emberiza cirlus*), lesser-spotted woodpecker (*Dendrocopos minor*) and willow tit (*Poecile montanus*). Of note are also 126 species of common birds many of which are likely to be present or using Steep Fields.

### Records for <5km

Records exist for all the target taxonomy groups. Records of interest for species which would have a territory that would likely encompass Steep Fields within it, in addition to those mentioned above, include dormouse (*Muscardinus avellanarius*), serotine bat (*Eptesicus serotinus*), Daubentons bat (*Myotis daubentonii*), noctule bat (*Nyctalus noctula*), Nathusius' pipistrelle (*Pipistrellus nathusii*), common pipistrelle (*Pipistrellus pipistrellus*) and barn owl (*Tyto alba*). There are records of 135 different species of birds within this area.

### Records for <10km

Records exist for all the target taxonomy groups. It is only really bird species that can travel distances such as this, so any other records are not relevant to Steep Fields. There are records of 198 different species of birds within this area.

## Site Habitat Mapping Visit

The site was visited on 1<sup>st</sup> May 2020 and traversed to identify the different habitats present and their boundaries. The boundary and newly installed pathway were mapped using GPS and then overlaid onto a recent satellite image of the site. The Boundary and footpath map can be seen in Map 1 and the habitat map in Map 2.



Map 1. Boundary of Steep Fields and newly installed Archer's Walk pathway on satellite image.



Map 2. Habitat boundary map of Steep Fields and southerly adjoining woodland.

## **Habitats Present**

### **Grassland**

On the western side of the site the grassland habitat covers approximately 0.4ha or 0.9acres, running east to west. It is situated on a steep slope with a height increase ratio of approx. 3:1. It is this slope which has given rise to the sites name.

A “W” shape transect was walked across the grassland and quadrats placed at 10 locations along the route, to record the grassland plant species present. The results of this survey can be seen in Table 2 below. A map showing the location of the survey points can be seen in Map 3 below.



Map 3. Grassland survey route showing locations of survey points numbered 1-10.

In total, across all ten survey points, a total of 33 different species of plants were recorded. Of these seven are grasses, 24 are wildflowers, one is a scrub species and one is a tree species.

The number of species recorded in each quadrat ranged from 8-15 with the average being 11 species per quadrat.

Quadrat 4 had the highest number of species recorded within it (15). Quadrats 3 and 7 had the lowest number of species recorded within them, both having 8.

The quadrats positioned on the upper parts of the slope had a higher number of species present (28) than that of those positioned on the lower part of the slope (25).

STEEP FIELDS												
		1	2	3	4	5	6	7	8	9	10	DAFOR
GRASSES	Yorkshire Fog	x	x				x			x	x	O
	Sweet Vernal Grass	x	x	x	x	x	x	x	x	x		D
	Cocks Foot		x		x		x	x	x	x	x	A
	Perennial Ryegrass		x								x	R
	Crested Dogs-tail								x			R
	Common Bent	x	x	x	x	x	x	x	x	x	x	D
	Timothy		x									R
FLOWERS	White Clover				x					x		R
	Birds-foot Trefoil	x	x	x	x			x				F
	Autumn Hawkbit			x					x			R
	Ragwort	x			x		x					O
	Meadow Buttercup				x	x		x				O
	Creeping Thistle	x			x	x				x		O
	Sorrel	x			x	x	x		x	x	x	A
	Yarrow	x	x		x	x	x	x	x			A
	Smooth Hawksbeard								x			R
	Ribwort Plantain	x	x	x	x	x	x	x	x			A
	Dandelion			x	x							R
	Red Clover	x				x			x			O
	Bramble		x									R
	Selfheal	x							x			R
	Common Mouse-ear							x			x	R
	Creeping Buttercup	x							x	x	x	O
	Dock spp.										x	R
	Oak Seedling		x		x	x				x		O
	Soft Rush										x	R
	Black Knapweed			x	x							R
	Stinging Nettle										x	R
	Creeping Cinquefoil			x		x						R
	Agrimony				x							R
	Spear Thistle					x						R
	Rough Hawkbit		x				x		x	x		O
	Field Wood-rush	x	x							x		O
Number of species per stop		13	13	8	15	11	9	8	13	11	10	
Average number of species for field		11.1										

Table 2. Species list for grassland survey and frequency shown using the DAFOR scale (D=Dominant, A=Abundant, F=Frequent, O=Occasional, R=Rare).

The quadrats positioned in the eastern side of the grassland (numbers 1-5) had a slightly higher number of species being present (27) than on the western side (numbers 6-10) of the site (26).

In terms of species abundance, the grassland is dominated by the grasses sweet vernal grass (*Anthoxanthum odoratum*) and common bent (*Agrostis capillaris*). Spread throughout the grassland and considered abundant are the wildflower species yarrow (*Achillea millefolium*), ribwort plantain (*Plantago lanceolata*) and common sorrel (*Rumex acetosa*). Other notable species of wildflower recorded are birds-foot trefoil (*Lotus corniculatus*), black knapweed (*Centaurea nigra*), creeping cinquefoil (*Potentilla reptans*) and agrimony (*Agrimonia eupatoria*).

Whilst surveying the grassland a number of species of butterflies and day flying moths were seen including orange tip (*Anthocharis cardamines*), large white (*Pieris brassicae*), red admiral (*Vanessa atalanta*), common blue (*Polyommatus icarus*), meadow brown (*Maniola jurtina*), comma (*Polygonia c-album*), large skipper (*Ochlodes sylvanus*), gatekeeper (*Pyronia tithonus*), marbled white (*Melanargia galathea*), ringlet (*Aphantopus hyperantus*), speckled wood (*Pararge aegeria*) and 6-spotted burnet (*Zygaena filipendulae*).

### Scrubland

Scrubland is comprised of woody stemmed species such as bramble (*Rubus spp.*) and gorse (*Ulex europeus*) and small trees species such as elder (*Sambucus nigra*), hawthorn (*Crataegus monogyna*) and blackthorn (*Prunus spinosa*).

Scrubland borders all sides of the grassland at Steep Fields and is dominated by bramble (*Rubus spp.*). In addition to the scrub around the grasslands edge there are also islands of bramble and tree saplings, predominantly oak (*Quercus robur*), spread throughout the eastern and upper parts of the grassland habitat.

There is a large block of scrubland in the middle of the site, covering an area of approximately 0.8ha or 2acres. This block is dominated by bramble (*Rubus spp.*), gorse (*Ulex europeus*), hawthorn (*Crataegus monogyna*) and blackthorn (*Prunus spinosa*) with young oak (*Quercus robur*) trees emerging throughout.

Underneath this block of scrub land are patches of stinging nettle (*Urtica dioica*) and bracken (*Pteridium aquilinum*) as well as areas of bare ground and leaf litter.

In the north-eastern corner of the site is a block of scrubland dominated by blackthorn (*Prunus spinosa*) and gorse (*Ulex europeus*) with sycamore (*Acer pseudoplatanus*), elder (*Sambucus nigra*) and spindle (*Euonymus europaeus*) trees spread throughout. As with the previous block of scrub the ground flora underneath the scrub is predominantly stinging nettle (*Urtica dioica*) and bracken (*Pteridium aquilinum*) as well as areas of bare ground and leaf litter.

During a sunny spell a silver-washed fritillary (*Argynnis paphia*) was seen flying over the scrubby glade.

### Broadleaved Woodland

Running along the sites entire northern boundary is an old trackway bordered by old hedgebanks on either side. Separating the site, almost perfectly into thirds, are two old hedgebanks running north and south. Running along the entire western and southern boundaries of the site are old hedgebanks. These old hedgebanks are dominated by species such as oak (*Quercus robur*), hazel (*Corylus avellana*), holly (*Ilex aquifolium*), along their lengths. With such huge and ancient trees, the canopies extend far and wide, covering significant areas of the site.

Spread throughout the canopy of the trees listed above are a smaller variety of trees including elder (*Sambucus nigra*), hawthorn (*Crataegus monogyna*) and spindle (*Euonymus europaeus*).

Underneath the canopy of the trees are some areas of outstanding displays of bluebells (*hyacinthoides non-scripta*) and early-purple orchids (*Orchis mascula*). Accompanying these are other woodland ground flora species including yellow archangel (*Lamium galeobdolon*), dog violet (*Canina viola*), lesser celandine (*Ficaria verna*), primrose (*Primula*

*vulgaris*), Hart's tongue fern (*Asplenium scolopendrium*) and honeysuckle (*Lonicera periclymenum*). Found along many parts of the old wall is spleenwort (*Asplenium spp.*).

### Wet Woodland

Running along the other side of the sites southern boundary is a small and shallow stream, flowing from west to east. As this stream levels out, it slows down and overflows the edge of the meadows. Over time this has created an area of wet woodland, often called alder carr woodland.

This woodland is dominated, as its name suggests, by alder (*Alnus glutinosa*) trees which are all multi-stemmed and of a very uniform height. Growing underneath these trees are a range of wet ground loving plants including marsh speedwell (*Veronica scutellata*), pink purslane (*Claytonia sibirica*), marsh marigold (*Caltha palustris*), cleaver (*Galium aparine*), lesser spearwort (*Ranunculus flammula*), broad-buckler fern (*Dryopteris dilatata*) and cuckoo flower (*Cardamine pratensis*).

There are some higher, and therefore slightly dryer patches of ground within this woodland type. On these the ground flora changes to include patches of bluebells (*hyacinthoides non-scripta*), red campion (*Silene dioica*), primrose (*Primula vulgaris*) and bramble (*Rubus spp.*).

### Specific Species of Interest recorded

Whilst carrying out the habitat survey a number of species of interest were recorded. These include an amazing specimen of crab apple (*Malus sylvestris*) tree, over 350 individual flowering spikes of early-purple orchids (*Orchis mascula*), an expansive, very active and multi-burrowed badger (*Meles meles*) sett, evidence of a sparrowhawk (*Accipiter nisus*) kill and slow worms (*Anguis fragilis*). The locations of all of these were mapped and can be seen on Map 4 below.



Map 4. Species of Interest Locations .

## Reptile Monitoring

Reptile felts were positioned in four places in the grassland habitat and monitored monthly. The locations of the felts can be seen on Map 5 below.

Since the surveying begun there has been one occasion when reptiles were seen under the felts. On 23rd May 2020, a single male was discovered underneath felt number 2 and a single mature female was recorded under felt number 4. Photographs of them both can be seen below in Images 1 and 2.



Map 5. Reptile felt locations.



Image 1. A mature male slow worm, felt 2.



Image 2. A mature female slow worm, felt 4.

## Historical Land Management Results

Following a desktop search of historical maps, aerial photographs and satellite images the following collection of maps and images has been assembled. They have all been centered on Steep Fields which is not always easily identifiable in the older maps.

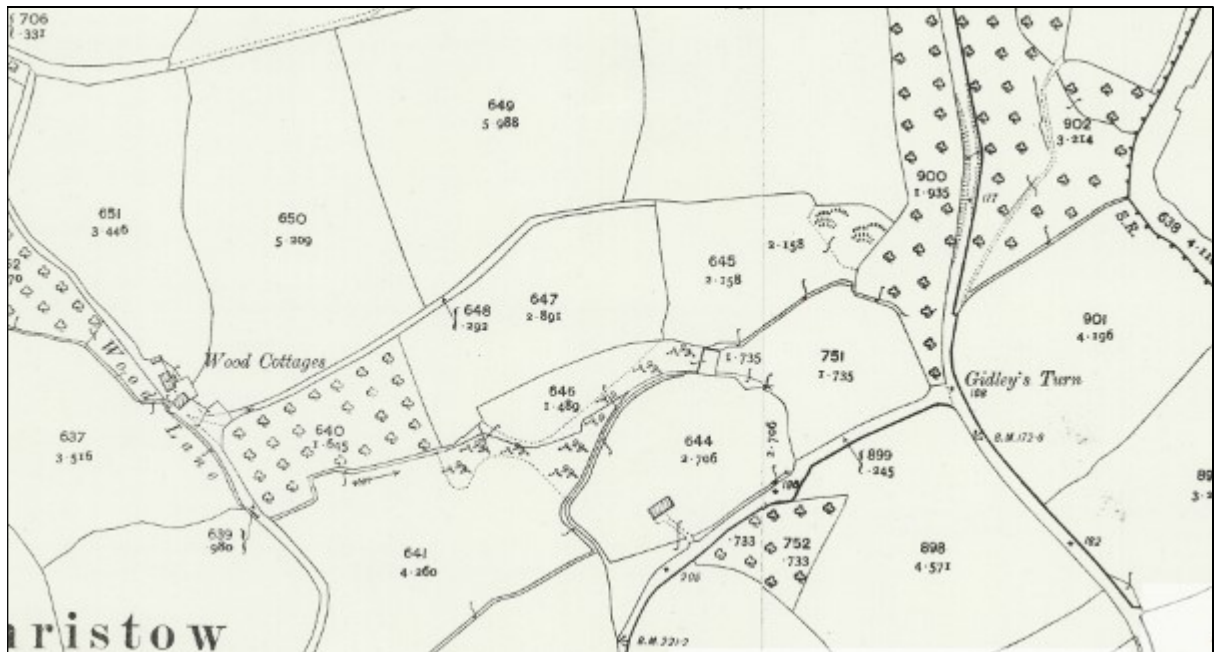
They will appear below in chronological order, with the oldest first. A discussion on what they appear to show is included in the next section of this report.



Map 6 1885-1900 Reproduced with the permission of the National Library of Scotland.



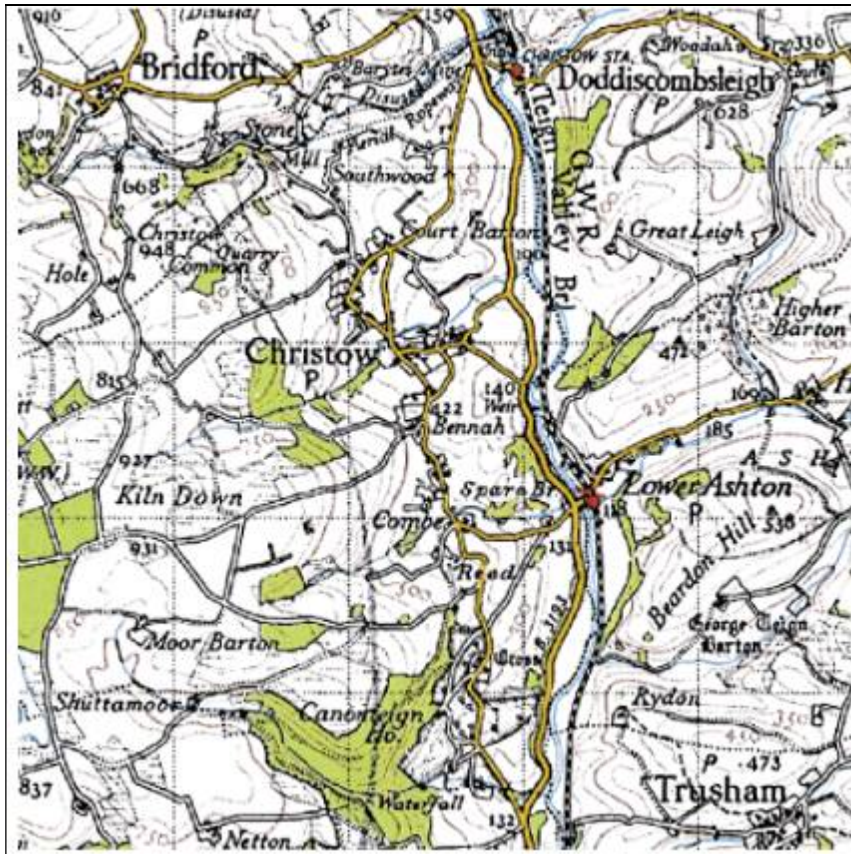
Map 7 1888-1913. Reproduced with the permission of the National Library of Scotland.



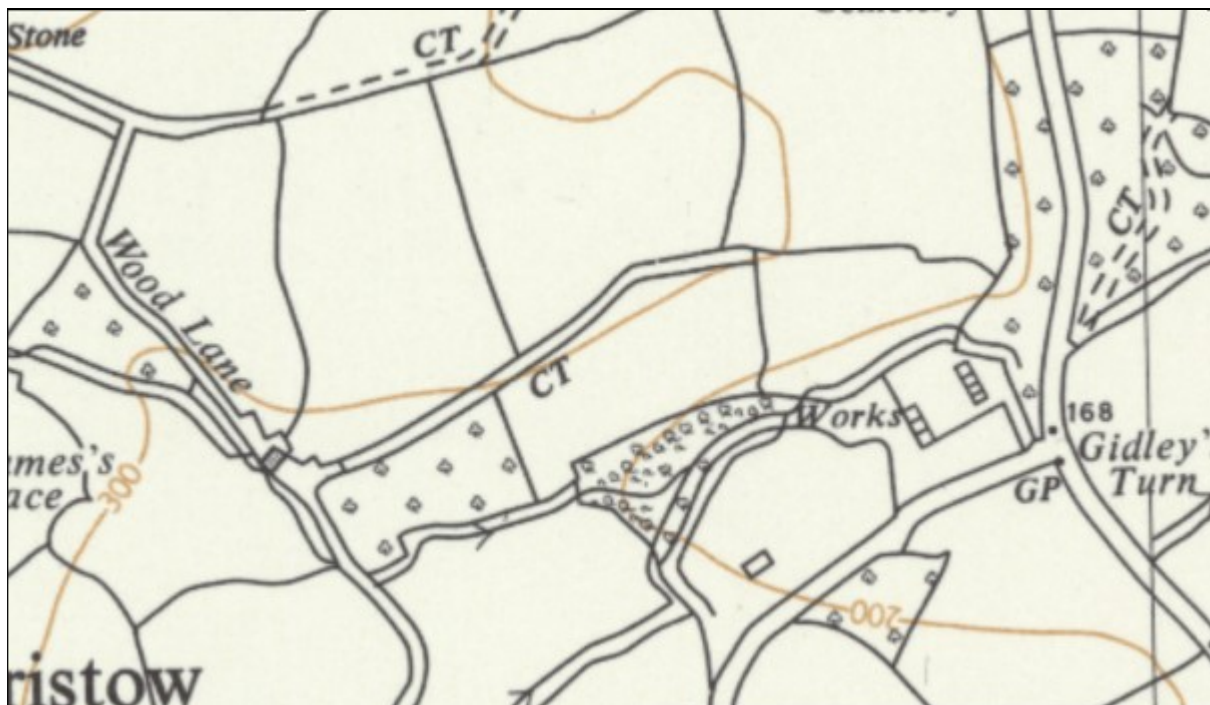
Map 8 1892-1914. Reproduced with the permission of the National Library of Scotland.



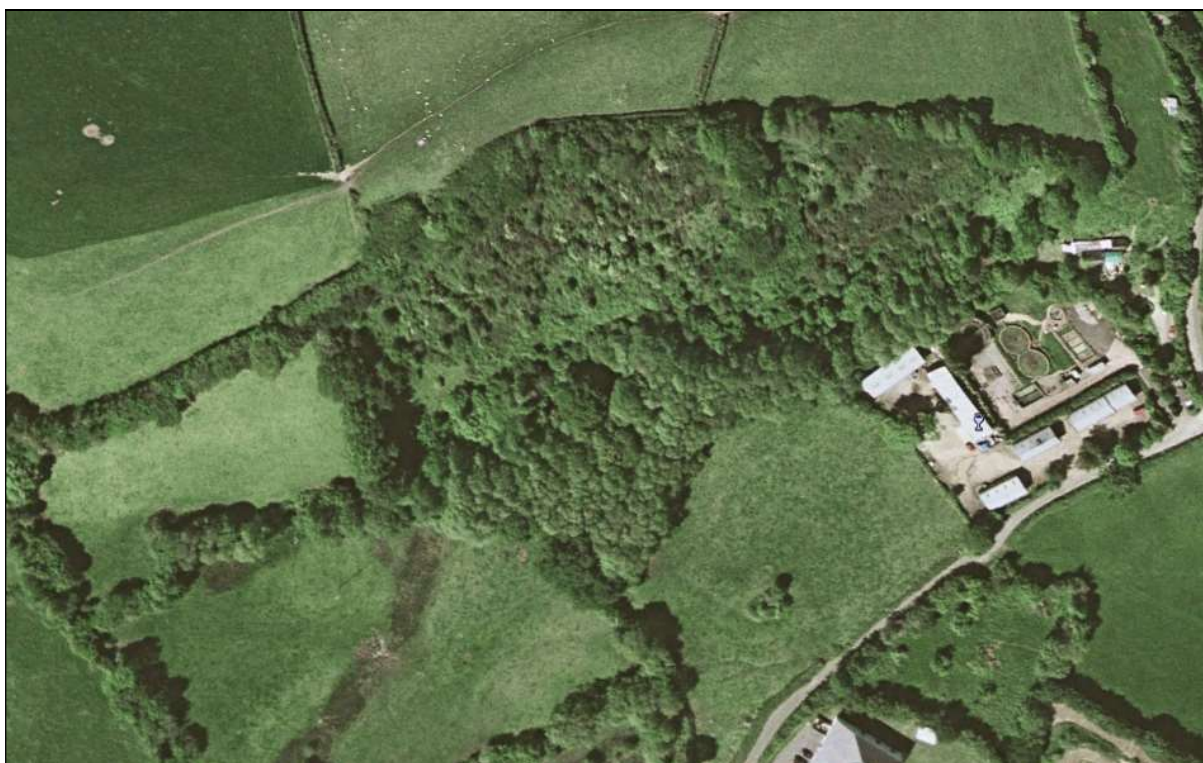
Map 9 1937-1961. Reproduced with the permission of the National Library of Scotland.



Map 10. 1946. Reproduced with the permission of the National Library of Scotland.



Map 11 1949-1969. Reproduced with the permission of the National Library of Scotland.



Aerial Photograph 1 c.2002. Map data ©2019 Google



Aerial Photograph 1 c.2006. Map data ©2019 Google



Aerial Photograph 1 c.2010. Map data ©2019 Google



Aerial Photograph 1 c.2011. Map data ©2019 Google



Aerial Photograph 1 c.2016. Map data ©2019 Google



Aerial Photograph 1 c.2017. Map data ©2019 Google



Aerial Photograph 1 c.2018. Map data ©2019 Google

### Historic Land Management from 1960's – Present

Following a telephone interview with the owner of Steep Fields, Tom Archer, the following timeline has been pieced together outlining the land management of the site in living memory.

c.1960 The western section of the site, which had previously been an orchard for at least 100 years, is ploughed up to create grassland.

1966 – Steep Fields was purchased by Tom Archer and his brother after it failed to be sold at auction. The original site was separated into three sections, the newly ploughed western meadow, a middle meadow with patches of gorse and bramble, a far eastern section which was dominated by gorse and scrub with patches of grassland. They were all separated by hedgebanks. The eastern field originally ran all the way up to the Teign Valley Road.

1966-1971/72 – The western meadow was grazed with cattle. As weeds and bramble emerged these were cut using a tractor mounted flail. Where the tractor could not reach at the top of the slope, this was cut by hand hooks and slashers. Having been cleared of scrub initially, the middle section was sprayed in late spring every year with a herbicide to keep the bramble at bay and maintain the grassland. The eastern section was swaled (burned) every few years to prevent the gorse from dominating. During this time, part of the eastern meadow (the section adjacent to the road) was sold off to provide a garden to the new development adjacent to Gidley's Meadow sewage works. Throughout this time the middle and eastern sections were grazed as a single compartment with the gates between the two sections being left open/removed.

1971/72 – The Archer family purchased some additional land in Christow which enabled them to use that for grazing rather than the middle and eastern fields which were extremely laborious to keep the scrub and gorse under control. From this point on all land management within these two compartments ceased.

1996 –The Archer family ceased farming western meadow and leased it out to a fellow farmer from Christow, Martin Partridge. The new tenant farmer continued to cattle graze the western meadow and use a tractor to top the encroaching scrub. However, hand cutting of the scrub around the perimeter of the field and at the uppermost sections of the meadow ceased.

2019 – The tenancy agreement for the western meadow ends in April. Cattle grazing removed from site.

2020- Archers Walk permissive footpath is created and a path is cleared and cut following the perimeter of the site. The footpath is officially declared open in August (planned).

### Additional Historic Photographs

A series of photographs are below. Photos are either taken on Steep Fields, or with Steep Fields present in the background. These are all courtesy of Fiona Freshney, personal photograph collection and from the Memories of Christow Facebook Page.



Photo 1. Mid 1970's Note steep Fields middle section on right hand side of photo still clear of scrub and clearly grazed despite management ceasing only a few years earlier. The western meadow can just be seen through the trees above the footballer on the left's head. The grass is much shorter, greener, and uniform in height suggesting it is still being grazed and managed.



Photo 2. Late 1970's. This photo is taken in the eastern most section of the site at the bottom of the section looking up to the norther easternmost corner of the site. The regeneration of gorse and bramble can be seen that has grown back since swaling ceased in 1971.



Photo 3, 1975 Christow Primary School class photo. The middle and eastern sections can be seen in the background. The eastern section has started to scrub over since swaling ceased and the middle section's grass is becoming more tussocky as grazing has ended.



Photo 4 c.1982 Ladies Tug of War at Christow show. Now fully covered in scrub, the middle section of the site can be seen dominating the hillside in the background. A small fragment of the western meadow can be seen on the left of the photo with the grass still short and green as it is being grazed.



Photo 5 1983 Christow show. Following a period of 20 years with no swaling or grazing taking place the eastern and middle sections of the site can clearly be seen to be completely covered in gorse scrub and scattered tree saplings.



Photo 6 2007. What would now be considered as young, scrubby woodland can be seen across half of the middle section and the eastern section of the site. The yellow flowering gorse and white flowering blackthorn can be identified suggesting the photo was taken in early spring whilst remaining trees were leafless.

### Fixed Point Photography

To help monitor the future changes of the site a series of photographs were taken from set points around the site. The photographs were then taken in a specific direction so that a landmark, or distinguishable feature is visible, so that it can be replicated in the future. By comparing these photographs, if taken every 5 years, it will be possible to see the gradual change that all of the habitats are likely to go through in the coming decades. A map showing the location of the photographic points and the direction and span of each photo can be seen in Map 12. Each photo then follows.



Map 12. Fixed Point Photography locations and direction of photo.



Fixed Point Photograph number 1



Fixed Point Photograph number 2



Fixed Point Photograph number 3



Fixed Point Photograph number 4



Fixed Point Photograph number 5



Fixed Point Photograph number 6

## **5. Discussion**

### **Ecological discussion**

Despite being relatively small, the site offers an excellent example of the various stages of succession that grassland goes through during its development to broadleaved woodland. Because of this it has a nice variety of habitats present, albeit in small areas.

The broadleaved woodland gives a lovely example of bluebell carpets in spring alongside its excellent displays of orchids.

There is a fantastic crab apple tree along the northern path which when in full blossom is a stunning sight. Come autumn it will be laden with fruit which will provide food for birds and mammals in the wider area.

The scrubby gorse and blackthorn woodland to the west of the bluebells has recently undergone some dramatic changes as the path has been cut through them. These will recover in time and continue to provide an important nectar and pollen source for insects in the surrounding areas and food for nearby birds.

Due to the steepness of the slope, and the way that the path has been cut into the slope to reduce the gradient for walkers, a new habitat feature has inadvertently been created that is likely to be of some value. Where the digger has cut into the slope it has exposed a steep bare soil slope which is south facing. This aspect is important as it means that it will have the sun shining straight onto it for much of the day. This will heat up the soil to a higher temperature than the surrounding area. This hot spot will attract many insects which wish to bask in the sunlight to help them warm up. In addition to this, the bare slopes which are now accessible will be suitable for mining bees and solitary mining wasps which will burrow tunnels into the banks and lay their eggs in there. This will be an area to watch in the future for some interesting insect records.

Mature trees are present on site, despite the young age of the woodland, due to the historic hedgebanks which run around its perimeter and split the site into three sections. The trees will provide good opportunities for bats and birds to roost and nest in. The hedgebanks themselves will also provide many opportunities for insects, small mammals and reptiles to live in due to the piled stones and cavities within them.

The middle section of the site is in a stage of transition and so no longer supports grassland species, nor does it support woodland species. Instead it provides an abundance of food and nesting opportunities for smaller birds and mammals. The nectar and berries from elder, hawthorn, blackthorn and honeysuckle will ensure species have a range of food available at different times of the year. The seeds within these berries will also ensure that there is a supply of new seeds available to spread out into the neighboring meadow.

The meadow itself is arguably the most interesting part of the site ecologically. Since its creation in the early 1960's it has been continually grazed with little artificial added nutrients or fertiliser. This has meant that the nutrient burden of the soil has remained low. The plants and grazing animals have utilised nutrients from the soil, and whilst some of the nutrients would have been redeposited back onto the grassland via dung, the overall nutrient levels would have dropped or remained low. This has resulted in a slow process of nutrient stripping from the grassland which creates a competitive environment for several flowering species, rather than allowing the vigorous grasses to dominate. This leads to an overall increase in diversity in the sward.

It has taken 50 years of grazing to get the meadow to the stage it is and there are patches of it that have some nice areas of birds-foot trefoil and knapweed within them. These flowers act as great nectar and pollen sources for the insects that use the site. Having visited on a sunny day in July to carry out the meadow survey it is clear that the site is used by a reasonably high number of species of butterflies with nine species being recorded in the space of a couple of hours. The south facing and steep aspect of the slope make it a very warm habitat which will help the insects to keep moving for longer periods of the day.

Grassland habitat is kept open through the intervention management of grazing, haycutting, swaling or topping. Now that grazing has stopped on the site the wildflowers and grasses will reduce in their abundance making it less suitable for some butterfly species. Whilst this may be a shame to witness for some, it is part of a natural process that a site will go through on its progression to becoming the beautiful, and equally important, bluebell woodland habitat seen in neighbouring sections.

In terms of species present the most significant are those that have been mapped on Map 4. Running parallel to this report being written is a breeding bird survey study for the site which may also show up some other interesting records.

Because the site is relatively small it will be limited as to the number of species it can support. However, due to its proximity to other areas of ecological value such as the River Teign, Scanniclift Copse, Haldon Forest, Dunsford Woods and the nearby reservoirs, it has the potential to play a part in a much wider network of habitats that could support a much broader range of species. As a site in the broader landscape it joins part of a nature network of increasingly important and scarce unfarmed habitat.

Thinking strategically across the Teign Valley, it could be that Steep Fields has the potential to play a really important role for species which need scrubby areas in which to nest. Species such as nightingale and Cirl buntings are both birds that need young scrubby woodland to nest in. Unfortunately, throughout the Teign Valley there are not many areas of scrubland due to current land use practices creating grassland or mature woodland areas. Both these two species of birds are known to be within the Teign Valley so there is hope that they could find and utilise this site to nest in which would be an incredible achievement.

In terms of reptiles and amphibians we have now managed to confirm that slow worms are still present on site. It would be reasonable to expect that common lizards are also still present on site due to the hedgebanks and grassy habitat, but no records exist, as of yet. With the felts in position we should be able to get records given time, however with the grassland habitat likely to evolve into woodland over the coming decades these species will inevitably be pushed out into the surrounding meadows and grasslands.

### Historical Discussion

Having spent time on site looking at the habitats and species present now, and then looking at historic records of the site it has been fascinating to be able to piece together the history of the site and how it has led to the site being as it is today. I suspect that it is quite uncommon for a site to have such a series of historic photos, maps and a living farmer who is willing and able to recall what and when changed on a site in the past 60 years.

What the results show is that the site has gone through a classic case of what is known as ecological succession. The definition of this is as follows,

***“Ecological succession is the process of change in the species structure of an ecological community over time. The time scale can be decades, or even millions of years after a mass extinction”***

This report shows how the site has changed from orchard to pasture grassland through to scrubland, into young scrubby woodland and now into broadleaved temperate woodland.

It is clear to see that the original hedgebanks which separate the three sections of the old meadows have acted as foci for the expansion of woody tree species into the grassland. These hedgebanks of native tree species such as oak, hazel and holly would have had an understorey ground flora of plants such as bluebells, bramble, and ferns. With the demise over time of the cutting, swaling and grazing these hedgebanks have spread their seeds and leaves onto the grassland and spread out in a dynamic way.

The ground flora too, has spread by its roots, tendrils and leading stems; successfully establishing from all of the edges of each field as there were no animals to graze the fresh shoots nor farmers with slasher hooks or tractors to curtail their growth. As these plants were allowed to grow unchecked there would have been a sudden pulse of vegetation growth across the site. Plants such as bramble and gorse all around the edges of each field would have had growth spurts. This would have increased the number of blackberries significantly which would have rapidly been picked up as a prolific food source by the birds and mammals of the area. As these animals moved around the site, they would have deposited these seeds, via their droppings or food caches, into parts of the site which were nearer to the centre of the fields. These would have then germinated and so created a new island of bramble, isolated from the surrounding blocks.

These islands of bramble and other thorny scrub have started to then carry out an important function. They act as a natural thorny barrier to any natural grazing pressure (deer and rabbits) for tree seedlings. The tree seeds germinate and start to grow under the protection of the thorny patch, slowly beginning to emerge out of the top of the scrub. It then continues to grow and eventually reach maturity, out shading the scrub which acted as its original protector.

This process of natural tree regeneration in an open meadow has already taken place throughout the middle and eastern sections of the site but is now starting to happen in the western section. If one looks carefully at any of the bramble patches that are forming islands within the western meadow you will see the tops of the tree saplings that will go on to become the mature trees that could dominate this area if it is allowed to revert to woodland.

Over time these islands of bramble join together to form one continuous block of bramble with individual saplings, in Steep Fields case of species such as oak, elder, hawthorn and blackthorn. This is the stage at which the middle section is currently in and has taken approximately 50 years. The result can be seen in Photo 7 below.



Photo 7. Middle section of Steep Fields showing full colonisation of bramble across old grassland with young trees emerging from the protective blanket of thorny branches.

When focusing in on the eastern section of the site, it is currently dominated by blackthorn and gorse bushes. A large number of these have recently been removed to allow the new pathway to be opened up but what remains is the ageing stands of blackthorn and gorse.

These scrubby and young tree species completely dominated the area following the cessation of swaling and can be clearly seen in photos 2, 3, 6 and 7. These have now reached their full growth and are starting to collapse on themselves and hollow out underneath. Given time these may either regenerate from their collapsed stalls or may be replaced by a larger growing broadleaved species such as oak, hazel or sycamore.

There is an amazing section of the eastern meadow which has recovered in a very different way to that of the previously mentioned gorse area since swaling ceased. It is the area immediately adjacent to the hedgebanks. Here, hazel stools have developed and spread out to create a small area of hazel woodland. Underneath this hazel woodland the bluebells have become widespread enough to create beautiful springtime displays. I suspect these have spread from the bulbs that would have been present on the old hedge bank. A picture of this display can be seen in Photo 8.



Photo 8. Bluebell and hazel woodland established alongside old hedgebanks in eastern section of Steep Fields.

Spread out amongst these bluebells are equally spectacular displays of early-purple orchids. These beautiful flowers, as their names suggest, emerge alongside the bluebells, and provide stunning spikes of tall purple flowers. On the site visit in May 2020 over 250 individual plants were recorded in several different locations. These locations can be seen on Map 4 and an example seen in Photo 9.

In terms of looking forward and to how the site will change in the reasonably future, it is clear that if the site is left alone and no management undertaken the bluebell woodland area of the eastern section will most likely remain as is. The scrubby part of the eastern section will mature to become more dominated by trees such as hazel and oak and will start to see plants spread into it from the neighboring bluebell woodland.



Photo 9. Early purple orchids in the western section of Steep Fields

The middle section will continue to change from the scrubby woodland, currently dominated by hawthorn and elder, to a young woodland with more hazel and oak trees dominating. It too will see bluebells start to creep into the ground flora as the emerging trees start to shade out the bramble and provide the ground conditions which the bluebells need to grow.

The meadow section will see the most dramatic visual changes now that mowing and grazing has ceased. The grasses will continue to grow in the short term and their dead stems will start to build up a layer of dead plant matter, called thatch, which will start to suppress some of the wildflower species found here. The 'islands' of bramble in the meadows will join with the bramble creeping out from the meadow's perimeter. Eventually the bramble and scrub species will cover the entire grassy area, much as has happened in the middle section. Growing underneath the bramble will be oaks and hazel trees and these will start to be emerging through and establishing themselves as small trees. In 50 years' time these trees will likely be 5-10m tall and their canopies will be starting to touch and close over which will be the point at which the bramble starts to die back.

With the fixed point photography points now set up, if continued, this will capture this process of succession and document it for future generations to be able to understand what has happened on the site and why it is the way it is.

## **6. Future Thoughts**

Now that there is public access to the site via the newly created path, it will provide an interesting opportunity for local people to be able to see the process by which the meadow and scrubland will naturally revert to woodland. This 'live' process will be a useful tool to be able to show people what can happen if farming practices change as a result of responding to the climate and ecological emergency. For example, farmers may be encouraged to cease certain farming and allow fields to re-naturalise, or possibly plant up with trees, in order to follow a similar path to Steep Fields as a way of combating climate change.

It may be very emotive for people to witness the demise of easily identifiable species such as wildflowers and butterflies as the grassland will be lost to bramble, and it will be extremely tempting for people to want to see it trimmed or cleared. However, the only real way that the species can be maintained would be through grazing, or cut & removal of grass, as this way the nutrients are removed from the grassland soil. Topping or strimming will cut the grass and bramble, but then leave it in situ to rot down into the soil and so speeding up the loss of the wildflowers. If conservation grazing, aimed at keeping the grassland open for wildflowers and butterflies, is not an option then an alternative approach would be to allow the site to progress through succession and develop into a woodland habitat over time by taking a 'hands-off' approach to management.

With the site being relatively small, and with population growth and the need for residential expansion across the whole country, new houses are likely to be needed in Christow and with that will come a need for areas of public open space and/or ecological mitigation to take place. The fields immediately to the south of Steep Fields, along with the wet woodland, offer a good opportunity to increase the size of Steep Fields, and with it increase its value for people and wildlife. If this opportunity were to present itself, it should be considered by the relevant planning authority.

With more people visiting the site and hopefully fostering a greater sense of ownership, there is potential for those people to become aware of, and learn about, the habitats and species present.

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