



How does the age of the Hazel coppice affect the bird  
box occupancy?

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### INTRODUCTION

Birds are a valuable indicator of the state of an environment. Man has been altering natural habitats for thousands of years. In the last fifty years or more, some of those changes have been catastrophic. It has been noted by the British Trust for Ornithology's (BTO) Common Birds Census, that bird populations such as the Song Thrush, Bullfinch and the Lesser Spotted Woodpecker, to name a few, have dramatically declined since the 1960's (Scarce Woodland Bird Survey – 2005 – 2006). It is difficult to pinpoint reasons as to why these declines are taking place.

Nature reserves are one of man's attempts at trying to right the balance. They play an important role in the survival of some species of birds. Species differ in their ability to adapt to changes taking place within their environment. The House Sparrow (*Passer domesticus*) at one time could be found in habitats all over Britain, however, now this species, along with the Starling (*Sturnus vulgaris*), have been added to the red list as their populations have declined by more than 60%. The reasons behind this decline are also still not clear.

Studies of birds and their habitats is a necessity to find the essential features of their environment. The habitat must provide adequate protection from the elements and an abundant supply of food and nesting materials. Along with those elements, the habitat must also meet their psychological needs (song perches or display points) and physical needs (washing and preening). There is also a question of competition to consider, how each of the species niche fits within the common habitat. If all of those elements are in place and there is minimal disturbance from man, species will thrive within those habitats.

Man can provide some forms of human innovations such as bird nesting boxes and feeding stations to keep the various bird species from leaving a habitat. Varying the size, height, species of tree, location and the directions the boxes face, throughout the reserve will ensure that most species are catered for.

Birds are able to adapt to changes that are forced upon them, but how much change will they accept? We need to be able to look at habitats from a wildlife point of view, to make sure that effective management techniques are in place. Paul Morrison (1988:13) said, 'If wild birds have a range of habitats according to their needs, a supply of unpolluted food and a sympathetic public, they and other forms of wildlife may be assured of a place in a world now totally dominated by man.'

## **AIM & OBJECTIVE**

The aim of the study is to identify species of birds that inhabit the nest boxes in the coppiced area of Clennon gorge. Nest boxes have been placed within some of the coppiced areas by Paignton Zoo's Reserve Warden. Through observing each nest box, a list of species using the boxes or found in the vicinity, can be compiled with a note identifying which part of the coppice they were observed.

The study has provided some insight into whether species have a preference on the density of the habitat they use for nesting and which species use the bird boxes provided or build their own nests using natural vegetation and trees.

The study is to compliment another small study previously done (author's name does not appear on the report), Bird Feeding Station – Project Update (Spring, 2001). The feeding stations are found in the quarry area at the entrance of the nature trail. The stations consisted of a variety of birdfeeders placed at various heights, through observations carried out, species visiting the stations were identified and recorded.

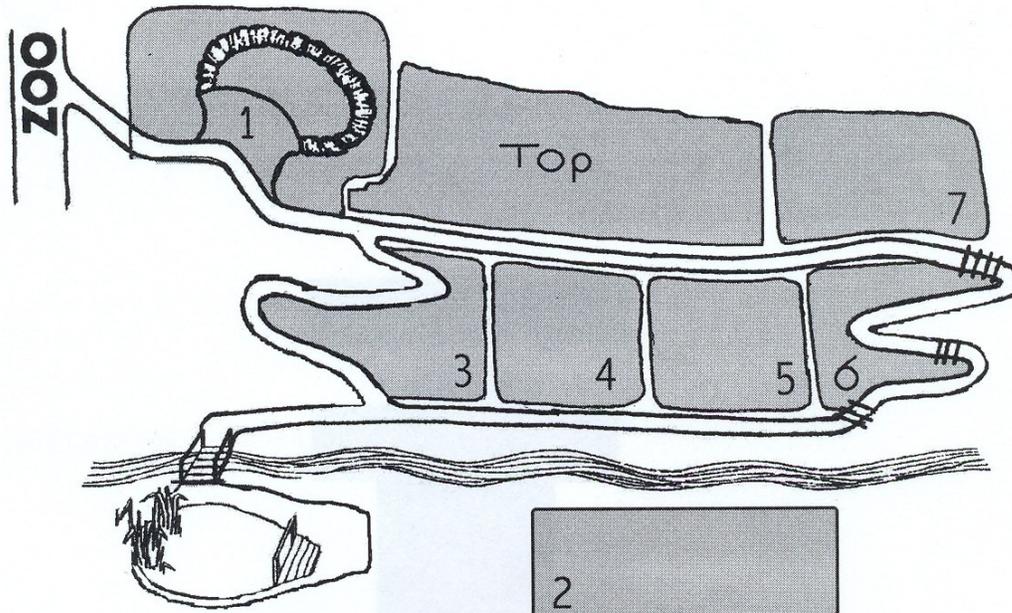
## **HABITAT**

The study is based in an area called Clennon Gorge which runs down to the sea through the urban areas of Paignton and Goodrington. The study concentrated on an area found directly behind Paignton Zoo. Clennon Gorge is a nature reserve owned and managed by the Whitley Wildlife Conservation Trust. The site has limestone grassland and semi-natural ancient woodland, because of this Devon Wildlife Trust has given the site status of County Wildlife Site. Clennon Gorge has an area of approximately 60 acres (23.4 hectares), it is a steep sided valley with woodland on both sides of the valley and a stream running through. Clennon is a deciduous woodland that consists of as ash (*Fraxinus excelsior*), field maple acer (*Acer campestre*), and coppice regrowth of mainly hazel (*Corylus avellan*). There are areas of scrub which are characteristic of limestone areas, along with wild privet, dogwood, blackthorn and Clematis. (Weeks, 1997)

Clennon Gorge is divided into 12 compartments, the coppiced area used in the study is found within compartments 1, 2, 4, and 5. This section is divided into 7 plots (coupes) of coppiced hazel with other species such as oak (*Quercus sp.*), beech (*Fagus sylvatic*) and ash (*Fraxinus excelsior*). The growth in each coppice plot varies from recently cut to 7 years in age, those areas with growth of 5-7 years is referred to as relic.

A trail winds through this coppiced area which zoo visitors have access to by means of a nature trail leading to a series of dredged ponds. These are ideal habitats for wildfowl and insects. Coupes number 1 is an old quarry and this is where the feeding stations from the previous study are placed.

Figure 1 Map indicating Clennon Gorge coppice plots, numbered areas indicate plot numbers, not number of years since cut.



## COPPICE

Coppice is from the French word *couper* (to cut), this involves cutting trees down to the ground leaving a shoot which then regenerates naturally into a mass of straight branches.

Coppicing is a traditional method of managed woodland to provide material for a range of uses. Hazel, chestnut and alder are all cut on a rotation shorter than 12 years, this wood is used to produce baskets, hurdles, pea-sticks and thatching spars. Ash and maple are cut on a 12 – 15 year rotation and produces wood for fencing, turnery and fire wood.

Coppicing creates a mosaic habitat of different aged coupes with a high level of species diversity. This is a benefit to wildlife as it produces artificial glades allowing sunlight to reach the ground layer. In the recently cut coupes, there is a variety of insects, butterflies, fruited shrubs and materials for nest building. All of these are important to the bird populations. The older coupes provide an excellent habitat for nesting and escaping birds from predators.

## NESTING BOXES

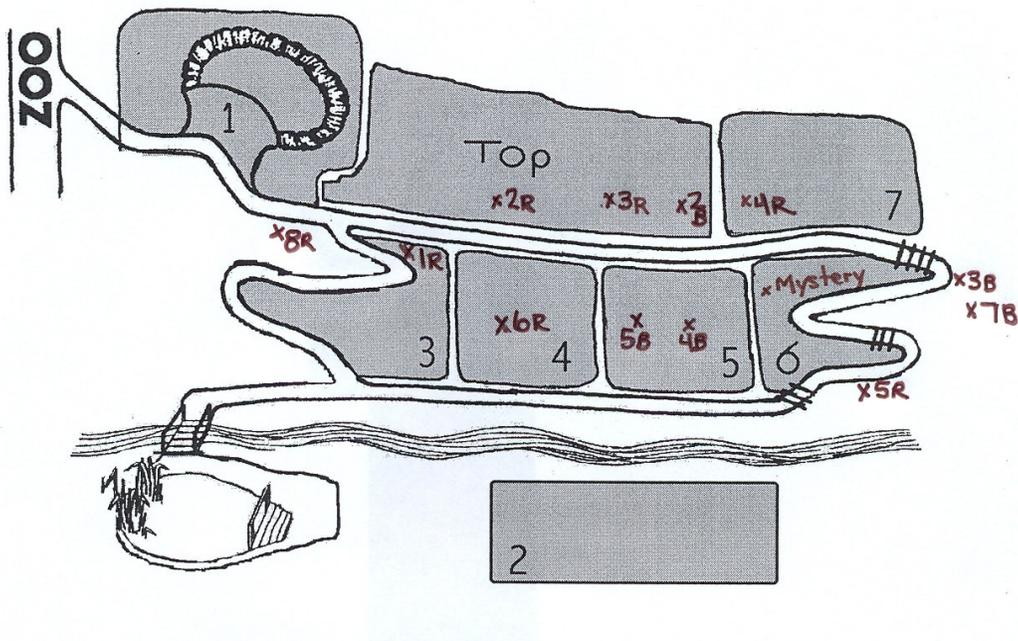
Nesting boxes have been placed in each coppiced plot except for coupes 1 and 2. Coupe 1 is the quarry with the feeding station and coupes 2 runs along the bottom of the nature trail on the other side of a small stream. In total there are thirteen nest boxes observed for this study.

Standard designs were used for the nest boxes; the enclosed box and the open box. The enclosed boxes each have a hinged lid and the size of the entrance varied from approximately 30mm to 60mm, hoping to attract tits and/or other small birds with the smaller hole and with the larger entrance possibly your house sparrow or starlings. The open boxes were put in place to attract robins or blackbirds. Each box was identified with a coloured number on the front panel.

Generally the condition of the boxes was good, however, there were three boxes that had squirrel damage to the entrance and one with damage to the lid as well.

GPS equipment was going to be used to record grid references for each box, however, the GPS equipment was not available during the study. There are still plans to complete this task at a later date as this would be useful for management plans for Clennon and any further studies that may be done. The map below shows the coupes and where the nest boxes are sited.

**Fig. 2 Map of Clennon Gorge with sites of the nest boxes marked.**



## SPECIES

Several visits were made to Clennon Gorge in the early stages of the study mainly to practice bird identification skills and to become familiar with the placement of the nesting boxes.

Below is a list of species (and their characteristics), that one would expect to find in a woodland like Clennon Gorge and recorded in the previous study on the feeding stations.

**Blue tit (*Parus caeruleus*):** A small bird with a round head that has a blue skull-cap and a black eye stripe. The underpart is yellow and the wings have a bluish colour. Blue tits use nesting boxes more frequently than other species. They nest from March – June, 1 – 2 broods and lay between 5 – 12 reddish-flecked white eggs. There is a 14 day incubation period by the female, 18 days fledging and 4 weeks until they are independent.

**Great tit (*Parus major*):** The largest member of the tit family. Yellow underparts with a central black band, glossy blue-black head with white cheek patches. They will use large and standard nest boxes, they are the most common user of nest boxes. They nest from April – July, with 1 -2 broods (a second clutch is rare). 5 – 12 reddish –spotted white eggs, 13 – 14 days incubation by the female, 18 – 20 days fledging and 1 -2 weeks until independent.

**Coal tit (*Parus ater*):** Small and almost colourless. Similar to the Great tit, it has a black head with large white cheek patches and narrow white wing-bar. Underparts are dusky greyish-buff and no central band. They will use a nest box, especially if placed on a conifer. Nest from April – June, 1 – 2 broods and 7 – 12 reddish-spotted white eggs, the female incubates the eggs from 17 – 18 days, 16 days fledging and 2 weeks until independent.

**Long-tailed tit (*Aegithalos caudatus*):** Very small round body with a long tail, mainly black and white plumage. Nesting from March – May, 1 brood, 8 – 12 reddish-freckled white eggs. Female incubates the eggs for 14 – 18 days, 15 – 16 days fledging and independent at the next nesting season.

**Robin (*Erithacus rubecula*):** Small and brownish with a rusty red 'bib', thin long legs. Nests from April – July, 2 broods, 5 – 6 red-speckled white or bluish eggs. Female incubates the eggs for 14 days, 13 – 14 days fledging and 3 weeks until independent. They will use an open-fronted box and sometimes the standard nest box with a large hole.

**Blackbird (*Turdus merula*):** All black with a yellow bill and narrow yellow eye ring. They will use an open-fronted nest box or a large bird-shelf. Nesting takes place from March – June, 3 – 5 broods, 3 -5 brown-freckled greenish-blue eggs. The female incubates the eggs for 13 days, 13 – 14 days fledging and 3 weeks until independent.

**Mistle thrush (*Turdus viscivorus*):** Larger than a song thrush, it has larger spots, more elongated and long-tailed. Nesting from late February – July, 2 broods, 4 speckled whitish eggs. The female incubates the eggs for 12 – 15 days, 12 – 15 days fledging and 2 weeks until independent.

**Jay (*Farrulus glandarius*):** Pale blue wing patch, white rump, pinkish-fawn body and the crown can be raised into a crest. Nests from May – June, 1 brood, 3 – 7 brown-flecked, greenish eggs. The female incubates the eggs for 16 – 17 days, 21 – 23 days fledging and 8 weeks until independent.

**Greater spotted woodpecker (*Dendrocopos major*):** Large bird (approx. 9 in) with white patches on its short wings and red under its tail. The male has a red nape. They may use the standard box with a large entrance. It may raid a nest box to eat the young birds inside. Nest from April – July, 1 brood, 4 – 7 white eggs. Both male and female incubate the eggs (the male at night) for 10 – 13 days, 21 days fledging and 1 week until independent.

**Nuthatch (*Sitta europaea*):** A streamlined body (neckless with a big head and long pointed bill). They are able to climb down a tree headfirst. Blue grey on top and paler below with a black eye stripe and will use an enclosed nest box. Nests from April – June, 1 brood, 6 – 9 reddish-spotted white eggs. The female incubates the eggs for 14 – 15 days, 23 – 25 days fledging and several days until independent.

**Magpie (*Pica pica*):** Large bird (approx 18 in) with greenish gloss to the black and white feathers and a long tail. Nest from March – May, 1 or 2 broods, 5 – 7 speckled greenish eggs. Female incubates them for 22 days, 22 – 27 fledging and it is not known how long before they become independent.

**Treecreeper (*Certhia familiaris*):** They have a long down curved beak, off white fringes on tips of the wings. Flies to the base of a tree and hops up the trunk. They will use a specially designed, wedge-shaped box if natural nest sites are scarce. Nest from April – June, 1 or 2 broods, 5 – 7 brown-spotted white eggs. Female incubates them for 14 – 15 days, 14 – 15 days fledging and again it is unknown how long before the fledglings become independent.

**House sparrow (*Passer domesticus*):** Brown upperparts, streaked with black and grey cheeks, crown and rump. They will use enclosed nest boxes and may displace tits from them. Nest from March – September, 2 – 4 broods, 3 – 5 brown-blotched white eggs. Female incubates the eggs for 14 days, 15 days fledging and 1 week until independent.

Of those species listed above the Mistle Thrush, Jay and Nuthatch were not observed during this study. The Treecreeper was observed hopping up the trunk of a standard ash, this species had not been recorded in the study on the feeding station.

## **METHOD**

The study was completed by carrying out observations on the thirteen nest boxes found along the nature trail in Clennon Gorge. These were completed over a four week period during April and May, 2005. Sticking to a routine was difficult, the original plan was to carry out observations three days per week, three times per day. Due to limited time, weather and commitments at work and home, only eight observations were completed, with the majority of those being done between 8 am and 9:30.

Observation sheets were drawn up to include the following information:

- Nest box number and colour;
- GPS grid reference;
- Age of coupes;
- Species of tree;
- Height the box was on the tree;
- Direction the entrance faced;
- Size of the entrance;
- Condition of the box;
- Surrounding vegetation;
- A Key;

The above information was found on the top of each observation sheet. This was followed by five smaller sections, one for each observation carried out. In these sections, the following information was included:

- Date;
- Observer;

- Time;
- Weather, including temperature, wind direction;
- Length of observation;
- Species seen;
- Resident or Vicinity;
- Another nest observed;
- Behaviour observed;
- Evidence of fledglings; and
- Other species and/or unusual behaviour observed.

Observations on each box were 10 minutes in length. Due to the extent of the damage to the entrance and lids by squirrels on three of the boxes and the lack of activity during initial observations, I felt that these boxes would probably not be used by any birds. Binoculars were used to observe the boxes as I was positioned on the nature trail to cause as little disturbance to the birds as possible in the coupes. The ground vegetation is quite dense as well, which made climbing or descending the slopes tricky. Binoculars also helped to make it easier to see the birds clearly enough to make notes on the size, colouring, etc of the species seen to help with identification.

See Appendix 1 for an example of the observation sheets used.

## DATA COLLECTION

The table below represents the findings of the study to date.

Nest Box No/Colour	Species of Tree	Height on Trunk	Age of Coppice	Occupied Y/N	Species of Bird
8 Red	Sycamore	16 ft	Relic	N	
1 Red	Beech	18 ft	Border on relic & 3 yrs	N	

6 Red	Ash	12 ft	3 yrs	Y	Blue Tit
2 Red	Oak	9.5 ft	Relic	Y	Blue Tit
3 Red	Oak	10 ft	Recently cut	Possible	Long tailed Tit
5 Black	Ash	12 ft	1 yr	Y	Great Tit
4 Black	Ash	12 ft	1 yr	N	
2 Black	Oak	7 ft	Recently cut	Y	Blue Tit
Mystery Box	Ash	10 ft	2 yrs	N	
4 Red	Oak	9 ft	Relic	Y	Blue Tit
3 Black	Turkey (non-native oak)	10 ft	Relic	N	
7 Black	Oak	15 ft	4 yrs	N	
5 Red	Ash	12 ft	Relic	N	

## DATA ANALYSIS

From the previous table you are able to see that six of the thirteen (46 %) nest boxes are occupied. The most common species observed using the nest boxes was the blue tit, this species occupied 67% of the boxes, whilst the Great tit and Long-tailed tit each only occupied 17%. The height the nest boxes were placed in the trees ranged from 7 ft to 18 ft. The height of the occupied boxes varied from 7 ft to 12 ft, it appears that nest boxes placed higher up the tree were not being used. 50 % of the occupied boxes were sited in either recently cut or a very young coupes area, the other 50 % being relic (5 – 7 yrs).

The occupied boxes were sited either on a standard ash or oak. Each of those standards had ivy and vines growing up the trunk and around the nest box but not overgrown so much as to block the entrance.

## **DISCUSSION**

From the observations that were completed I would say that the age of the coupes does seem to factor in which boxes are occupied. From looking at the map you can see that the six occupied boxes were centrally located. Three of the boxes are in a coupes recently cut or a young coupes. The other three are in a relic coupes or a coupes that has some growth (3 yrs).

I would suggest that the reason for those particular boxes to be occupied is because the glade created by the recently cut coupes, provides an excellent area for the birds to find nesting material and food. The relic and older growth provide ideal protection from the elements, a source of food, sites for song perches, etc and protection from the general public. The six occupied boxes are located far enough off the nature trail or surrounded by other standards, trees and shrubs, that it would be difficult for a member of the public to have easy access to the nests. A couple of them are situated so that unless you know the boxes are there, you would not be aware of their existence.

Boxes 8R, 1R, 3B and 5R of the unoccupied boxes are sited on standards directly next to the nature trail and have less seclusion from the general public. It could be possible for a young, enthusiastic person to come along and climb up to investigate the contents of the box.

Nest boxes 5B (black) and 6R (red) have no protection from other standards or shoots, etc. They are standing in the middle of an area of coupes that have one year and three year's growth around the base.

The Blue tit is the species that occupies more of the nest boxes than any other, this should not be surprising as they are the easiest to attract to an artificial nest box. The height the box sits in the tree also does not factor with blue tits, the box can be from ground-level upwards.

On a few occasions I also observed species that visited the pond located at the end of the nature trail. The pond was being used by a variety of bird life; those species recorded in the study and several duck species that had wondered in from the main part of the zoo. There is a slow running stream that runs along the bottom of the nature trail where I saw a few house sparrows bathing.

The reserve warden has recently replaced the damaged lid and fronts on box 8R, 1R and 3R. I would like to keep an eye on these three boxes to see if they become occupied now that the

damage has been repaired. The squirrels always seemed to be in this vicinity, it could be because they are close to the feeding stations in the quarry.

During the observations several species of butterflies were observed within the glades, which are covered in nettles and bluebells; the Peacock (*Inachis io*), Red Admiral (*Vanessa atalanta*), Orange Tip White (*Anthocharis cardamines*), Green Veined White (*Peris napi*), Small White (*Pieris rapae*), Large White (*Pieris brassicae*) and the Speckled Wood (*Pararge aegeria*). On a couple of mornings and one lunch time, the air was full of midges which the birds were frantically feeding on.

The careful management of Clennon Gorge must always be kept in mind. The requirements of wildlife are complex and Clennon should be maintained as practicable to present the best conditions. Suitable food, cover and breeding grounds should be the targets.

## **CONCLUSION**

My question was whether the age of the hazel coppice affects the occupancy of the nest boxes. Although it has been a limited study and the data is not strong, it has raised some interesting points.

It would appear from that the birds preferred a mixture of young coppiced areas fringed by relic or they nested in the relic with the glades a few feet from the nest box area. Before next spring, it may be beneficial to lower the height of those bird boxes that are higher than 12 ft and further observations carried out to see if this makes a difference to the number of nest boxes occupied next spring.

There are three boxes that have been made using the open design, none of these boxes are occupied. Again, is this relevant and need further study since there are plenty of blackbirds and robins in Clennon Gorge. Where are they nesting?

It is no surprise to find that the Blue tit was the most common species to be seen using the boxes during the study. The population of the Blue tit within Clennon Gorge and around Paignton Zoo in general, is a thriving population. There are other boxes within the zoo grounds which are also occupied by Blue tits.

I have decided to continue with the study after the module is finished. The weeks that I observed the boxes, I saw no evidence of fledglings. During the next few weeks, or possibly days, the fledglings should be ready to leave the nest boxes. This would be wonderful sight to witness.

Once the fledglings have left the nest, it would be useful to note how long after they have fledged whether a second clutch is laid. It would also be good to see if any of the other boxes become occupied.

During one observation on box 3R which is sited on a standard oak, a blue tit left the box, flew to a branch and then up into the canopy of the tree. As I followed it with my binoculars, to my surprise she was not alone and there were approximately 10 or more tits in the canopy. Whilst watching the tits in wonder, I noticed a larger bird fly onto a branch toward the top of the tree. I made some quick notes and on returning to the office later I checked my notes with the Collins Bird Guide and consulted with my colleague, I was thrilled to find that it was a Greater spotted woodpecker.

This study has increased my interest in bird watching, there is so much to learn and I have only just begun. As I observed the boxes I would hear some of the most beautiful melodic birdsongs and whilst watching the birds enter and leave a box, I wanted to be able to identify the birds that were singing all around me. Some songs I could distinguish, for example the robin and house sparrow. This is a skill that I need to develop further and have found some useful websites and CD's fit for purpose.

Britain has more birdwatchers than any other country in the world. Some birdwatchers travel anywhere in the country, or the world, to get a glimpse of a rare species. However, the majority of birders are quite content to watch the birds in their natural surroundings whether it's in a park or their own back garden. Birds provide us with much more pleasure than we give them credit for. We have become fascinated by their inquisitive behaviour, colourful plumage, flying displays and their array of beautiful songs.

Bright (1992:425) said, 'Of the survivors, most birds today are only still here either because they are sufficiently specialized to have successfully carved out and maintained a unique niche in the face of competition, or because they are opportunistic enough to take advantage of what is on offer. When we destroy or modify traditional habitats, we are altering the playing field on which the birds evolved to play. The rates at which species are declining indicate that, despite our best efforts, ever more species are almost certain to become museum curios.'

I have started a sketch book of the species that I have seen whilst in Clennon or on walks through other parks, making note of where, when, identification marks, etc. For years I have taken birds and birdlife for granted, but now I find myself stopping to listen or watch with fascination at what a wonderful species they are. I have had some experience with birds of prey and their majesty, but I never truly appreciated the beauty of our every day garden or woodland bird until this case study.

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