



Executive Summary

Introduction

Approximately 20 years ago, to the south of Bishop Middleham village, a lake began to develop as a result of groundwater flooding. Now known locally as Castle Lake, this water body covers an area of 13 ha (33 acres). The purpose of this report is to evaluate the ecological value of Castle Lake within a regional and national context.

An Ecological Assessment of Castle Lake

This study is based primarily on baseline bird data records, but it also includes all other available flora or fauna records of significance. Key findings of this report include:

- The site contains the earthworks of Bishop Middleham Castle, the principal seat of the Prince Bishops of Durham from about the eleventh to the fourteenth centuries. This is now a scheduled ancient monument.
- A complete medieval deer park wall, albeit in need of urgent restoration work, wholly encloses the site. A remarkable and possibly unique feature for a wetland site.
- Nationally, Castle Lake is a comparatively rare habitat as it is located on Permian magnesian limestone and therefore is a notable habitat within the region.
- At 13ha in size, the water body is one of the largest within the lowlands of north east England.
- Castle Lake forms an integral wetland feature on a chain of such sites along the length of the River Skerne and its watershed. This provides a major flyway for multiple migrating and breeding bird species.
- Within its immediate locale, Castle Lake is surrounded by multiple small wetlands and watercourses, in addition to sympathetically managed farmland and scrub woodland. This provides a diverse and rich habitat for a wide range of species
- With the permission of the landowners, small scale and focused site management work has been carried out by volunteers, including the creation of islands and scrapes, the installation of bird nesting platforms and planting of a reed bed. This has had a marked effect on increasing breeding bird numbers.
- A bird hide, erected in 2009, by Durham Bird Club, is well used, with over 200 key holders registered and almost daily bird recording.
- Public access via multiple public footpaths, bridleways and permissive access, provides local residents and visitors wide accessibility to the site.



- Castle Field, at the north end of the site is a particularly rich calcareous grassland habitat, with 44 botanical species recorded in 2007.
- Seventeen species of Lepidoptera have been identified at Castle Lake.
- Mammal species recorded include Water Vole and four species of bat,
- A total of 183 bird species have been recorded, including multiple species regarded as birds of conservation concern. In 2011, 150 bird species were reported at Castle Lake and its surrounds, leading the site to become highly regarded for its ability and regularity to attract rare and unusual birds.
- Thirteen bird species, including several farmland birds, identified as being 'Red' birds of Conservation Concern (species of greatest concern) breed annually at Castle Lake.
- In 2014, a pair of rare Black Necked Grebes bred successfully. The UK breeding population is estimated to be just 52 pairs.
- Upwards of 10 pairs of Corn Buntings breed at Castle Lake and its surrounds. This is the only remaining breeding area for this species within County Durham which is undergoing a rapid national and international population decline.
- Castle Lake attracts significant numbers of migrating and wintering wildfowl and waders, with often thousands of birds, of multiple wildfowl and wader species, being present at any one time during autumn migration.
- Counts of some species of waterbirds and waders, for example Little Grebe and Wood Sandpiper, have been in excess of those recorded on the much larger Tees Marshes.



Conclusion

As demonstrated by the following report, Castle Lake is a highly significant inland wetland supporting a wide range of flora and fauna, not only regionally, but also in the case of select species, nationally important numbers of birds, some of which have been recorded to be breeding.

It is also important to point out that underpinning this report is a broad suite of fieldworker surveys investigating a wide spectrum of flora and fauna, thus further underlining a high level of interest already taken in this site by ecologists regarding its significance and potential.

Some management work has already been carried out, but the opportunity is taken here to stress that there is a great deal of potential to vastly improve this site in terms of biodiversity and in turn, greatly enrich the visitor experience and provide a vital asset to the community in terms of a visitor attraction, educational facility and enhanced natural environment. Any increased footfall to the site would then be of economic benefit to Bishop Middleham and the immediate locale, through wider and positive exposure and direct visitor spend.

The conservation designation of Castle Lake is currently minimal. In light of this report, it is hoped that Castle Lake will receive improved site protection, a long-term plan of sympathetic site management work so that the full potential value of this site can be completely realised.



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1. Introduction

The area surrounding the village of Bishop Middleham has, historically, long had a wetland character, consisting of created and managed fishponds, rivers, fen carr and, most recently, ponds formed through rising groundwater levels. To the south of the village is a large body of water formed mainly from ground water and part of a complex of wetlands surrounding the village on two sides. A series of ponds started developing around twenty years ago, with the largest and most important as regards its bird life, now known locally as 'Castle Lake'.

Although this lake is the most recent of the area's wetlands to form, it has become, by some measure, the largest and undoubtedly the area's most important area for birds. Indeed, it has become a very significant site for birds in the North East, and forms a key link within the system of inland lowland wetland on the limestone escarpment in County Durham that include the larger water bodies of Hurworth Burn, Crookfoot and Hart Reservoirs and also much smaller, but still highly important ponds at Wheatley Hill, Cassop and Quarrington Hill.

The area surrounding the lake includes the River Skerne, a small sewage treatment plant operated by Northumbrian Water, a mosaic of low-lying fields with a tendency to regularly flood, small ponds and reed beds, ancient hedgerows, woodland, magnesian limestone grassland and disused railway lines. This also offers a rich and diverse range of habitat that supports a wide range of birds and other flora and fauna.

This special habitat has led Durham Bird Club to consider Castle Lake as one of the most important inland sites in North East England. To enhance the site in terms of birdlife, Durham Bird Club has been working with the landowner farmer for the past fifteen years to develop the lake utilising its natural profile to create a series of breeding islands, scrapes and reed beds to support and maintain important breeding birds. Castle Lake is also important as its geology is underlying magnesian limestone rock, typical of the local area and very important nationally as part of the Durham Magnesian Limestone Plateau, one of England's 159 National Character Areas, as defined by Natural England.

A magnesian limestone outcrop stretches from Nottingham northwards through Yorkshire and into County Durham, where the Durham Magnesian Limestone Plateau extends in a broad triangle south-westward from the North Sea coast, to the valley of the River Wear to the west, and south west inland to Newton Aycliffe. This geological landscape provides a specialist and rare habitat attractive to a distinct range of flora. The Durham Plateau includes 4 sites designated as National Nature Reserves, and a further 52 Sites of Special Scientific Interest (SSSIs), thus underlining the recognised high level of flora and fauna within this zone. The Plateau is characterised by an open,



agricultural landscape, a limestone escarpment to the west and the Magnesian Limestone aquifer that sits below the area, which is thought to be the main water feed to Castle Lake. Castle Lake is located on the very southern edge of this geological zone, with the River Skerne roughly marking the border to the more open plains of the Tees Lowlands, some features of which, such as low-lying wetland, can be found in the immediate environ surrounding Castle Lake, for example the A1 Flashes ((Natural England (2013a); Natural England (2013b)).

Castle Lake has a rich history. 'Castle Field' at the north end of the site contains the earthworks (now a scheduled ancient monument) of Bishop Middleham Castle, the principal seat of the Prince Bishops of Durham from about the eleventh to the fourteenth centuries. At the same time, a number of causeways were built across the marshy ground to aid transport and manage water levels as there was an extensive series of fish ponds, shallow pools and narrow sluices all to provide fish to the Bishop's table.

Although it has been called a castle, it was not a true fortification, but a well-guarded manor house. These constructions are still in existence, as is a deer park wall, of medieval construction, that enclosed a deer herd intended to provide fresh meat and hunting for Bishop. Much of this wall is still in existence and it runs the length of Fougarts Lane and neatly encloses Castle Lake and its surrounding pasture (Durham County Council, 2012).

Today, the area surrounding the lake has a network of numerous public footpaths and bridleways. Large numbers of walkers and local residents frequent the area to enjoy the natural environment and they take great pleasure in seeing the wildlife. As a measure of its popularity, the Durham Bird Club bird hide, situated at Castle Lake, has over 200 registered key holders.

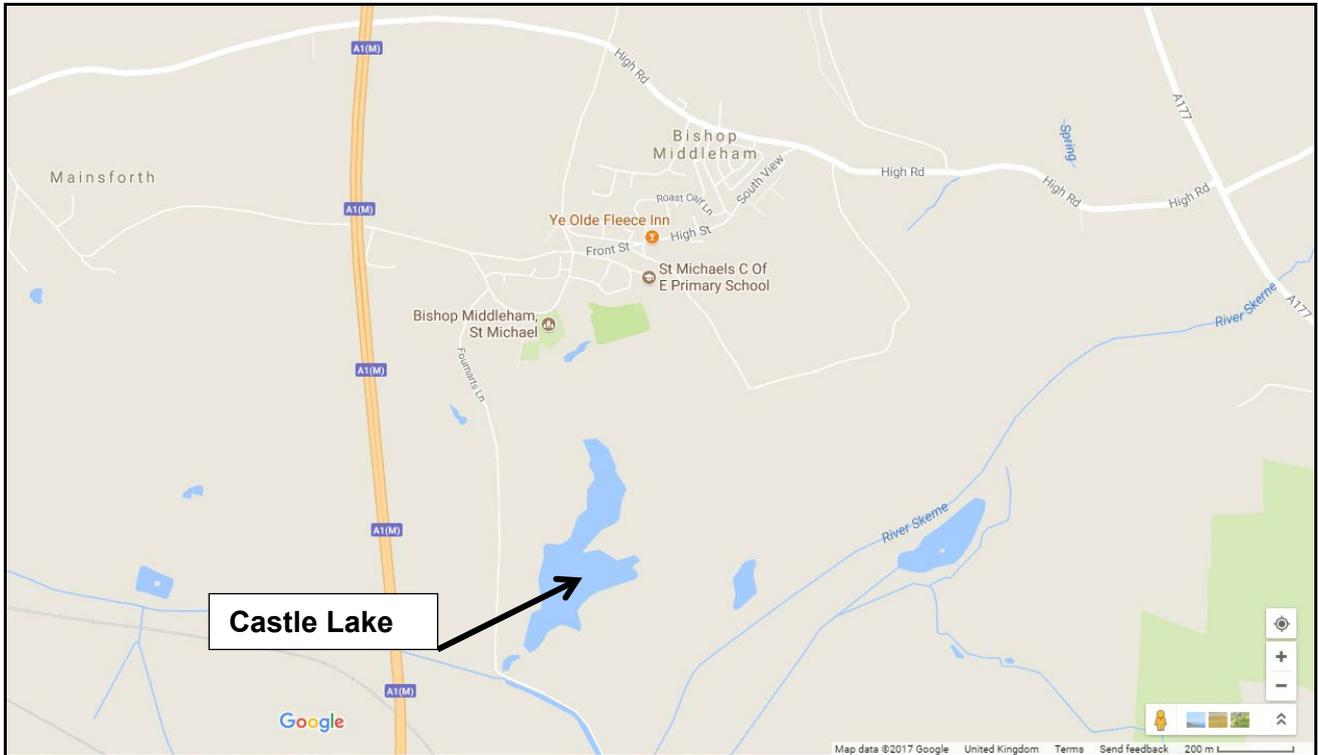
Looking south over Castle Lake, from 'Castle Field' and the earthworks of Bishop Middleham Castle.

An interpretation board provides an impression of Bishop Middleham Castle, with explanatory text (Fred Milton, May 2017).



2. Location and Site Summary

Castle Lake is situated to the south of Bishop Middleham village in County Durham.



Location of Castle Lake (Grid Ref; NZ 3230 Map data 2007 Google)

Topographical Details

Altitude: 79m above sea level.

Soils: Acid to alkaline

Land Tenure

Farmers Messrs. J and M Davison own the land within the red boundary line on the above map. Castle Lake covers an area of 13 ha (33 acres), just south of the village of Bishop Middleham as shown on the attached location plan. It lies within a wider area bounded by medieval deer park walls, extending to 40 ha (99 acres).

Map Coverage

Ordnance Survey Maps: Scale 1:25,000- Sheet Pathfinder 23/33 Spennymoor and Coxhoe.

Geological map- North Sheet Solid 1979 scale 1: 625,000.

Photographic Coverage

Aerial Photographs held by Durham County Council and Natural England for Magnesian Limestone areas.

Land Designation

Castle Lake is currently designated as a Local Wildlife Site (Durham County Council designation)



2.1 Castle Lake in Context

Castle Lake began to form approximately 20 years ago; the presence of field fence lines and posts through the lake provide testament to the relatively infant nature of this water body. The location map of the site also illustrates the previous field boundaries. The lake and surrounding pasture is part of a larger wetland complex surrounding Bishop Middleham. This includes a number of permanent and semi-permanent lakes and wetlands, including Fishburn Lake, 'Stoney Beck Lake', 'Alan's Pools' and the 'A1 Flashes'.¹

These sites are also noteworthy semi-permanent wetlands within their own right, but together they form one of the largest and most an important wetland systems in the county. All of these sites are situated close, or adjacent to, the River Skerne flood plain.

The area is susceptible to seasonal floods, thus creating ideal habitat for a wide range of wintering, breeding and passage birds as well amphibians and mammals, and a rich variety of flora. This very important wetland complex lies at the centre of an important chain of wetlands linked by the Stell ditch, which includes Ferryhill Carrs Nature Reserve, the adjacent Bishops Swannery ponds at Thrislington linking to the HLS wetlands at Mainsforth and Nunstainton carrs with Bishops Fen and Hardwick Country Park on the south-eastern boundary.

This large wetland system is then directly linked to the North Tees marshes SPA, RAMSAR and North Pennines SPA. Significant movements of wildfowl and waders rely on these wetlands for feeding and resting during critical periods of the year.



Stoney Beck Lake, November 2010 and Fishburn Lake, August 2015 (Neil Fawcett)

¹ It should be noted that the latter three of these wetland features carry unofficial names provided by local birdwatchers to enable species recording and cannot be located on maps. These site names are referred to in this report.



Castle Lake is bounded by four large pasture fields. These are currently, as of 2017, grazed by cattle and sheep up to the water's edge. The lake has varying vegetation structures but is primarily fringed by rush species. A water treatment works, managed by Northumbrian Water, is also located on the western corner, within an enclosed fence. The farmland was under a countryside stewardship agreement until 2015. Where arable reversion to create wildflower meadows was undertaken, this was to prevent pesticide input into the lake. There is new permissive access around the lake, with other public access over the surrounding area.

Habitat work has taken place on the lake and its surrounding edges. This has included the installation of rafts for breeding birds, the creation of shallow scrapes, the planting and fencing of a small phragmites reed bed and the development of a series of small islands. Some small-scale hedgerow planting has also been carried out. To enable better bird recording and lessen disturbance, in 2009, the Durham Bird Club erected a bird hide on Northumbrian Water's sewage treatment site. The hide is open to anyone who purchases a key. This facility has proved very popular with visitors and continues to be managed by Durham Bird Club.

A number of information boards have also been installed around the site to guide visitors and provide information on the wildlife that may be seen.



Bird hide, erected in 2009 and information board installed by Durham Bird Club (John Olley)



3. Environmental Information

This section provides a summary of the current habitat at Castle Lake and the flora and fauna recorded at the site.

3.1 Physical

The underlying geology of Castle Lake is solid, Permian magnesian limestone. Soil types are predominantly light, magnesian limestone and till. Castle Lake, as a water body on limestone, is a comparatively rare habitat. As Durkin has underlined with regard to magnesian limestone habitat, 'the porous nature of the limestone reduces the likelihood of ponds and marshes forming on its surface. Only the presence of glacial boulder clay here and there creates a waterproof liner for wetlands. Consequently, ponds are very scarce on the limestone, and most are in old clay pits. They often have a richer flora than ponds on the coal measures. Particularly important are "flushes", which are grasslands on sloping banks, with calcareous water trickling downhill' (Durham Wildlife Trust, 2007).

3.2 Habitat & Structure

Durham Bird Club has developed Castle Lake to attract a wide range of bird species with the addition of breeding islands, scrapes, wet ditches, reed beds and hedgerow systems. The surrounding pasture is primarily grazed throughout the year with fields also cut for silage, although in within the last 20 years, these fields have also been cultivated for cereal and root vegetable production. Some fields, for example 'Castle Field' to the north of the site, also include areas of exposed limestone rock because of historical quarrying activities and the existence of ruined buildings. This provides suitable habitat for specialist flora associated with magnesian limestone. The old 'deer park' wall, albeit in need of substantial restoration, neatly surrounds the land tenure. This ancient wall is full of nooks and crannies amongst the crumbling masonry, offering an interesting habitat for invertebrates, small mammals and birds, interspersed with scattered scrub and individual hawthorn. A modern sewage water treatment works serving Bishop Middleham is now situated in the central north-west corner, and amongst the water treatment facilities are cut grassland and occasional shrubs. A butterfly and dragonfly survey of this site in 2010 concluded that the sewage treatment works had little environmental value, especially with regards to botanical interest, owing to the mown grassland of the main operational zone and the heavy grazing taking place in the site's redundant area (Eales, 2010).



Deer Park Wall (south end and north side) demonstrates the completeness of this structure and its poor condition, but also it's potential as a micro-habitat (Fred Milton)

The north of the lake is shallow with peat formation. Lowland peat bog is a rare and increasingly threatened habitat. The shallow basin formed by Castle Field and quarrying activity allied to poor water drainage provided ideal conditions for peat formation, as plant decay is slowed leading to layers of decomposing plant material. In addition, this boggy habitat may also have been supplemented by humus sediment from a sewage works that previously operated in this area from the early twentieth-century (now superseded by the current works).

A surviving small ruined brick building in situ may be a remnant of this plant. The shallow character of the north end of the lake allows extensive bare mud areas to develop in the autumn. This provides a rich feeding area and is especially attractive to feeding birds, although constant grazing has denuded this boggy area of flora of importance. The central section of the lake is deepest with a maximum depth of 1.5m. To the south, the lake is more of a gravel substrate with recently a planted *Phragmites* reed bed on the western edge. Areas of fencing have been erected to remove grazing pressure to develop marginal vegetation.

There is also a small pond to the west of the lake, separated by a causeway, and was formed by previous quarrying activity. This additional pond is attractive to small numbers of wildfowl and wading birds.



Castle Lake - looking southeast towards Sedgfield from the bird hide and from Castle Field. Emphasises extensive muddy margins of lake, May 2017 (Fred Milton)



Aerial view of Castle Lake – outline area of site boundary clearly defined (Google Map)

3.3 Biological – Flora (Lake Area)

Tree cover around the lake is minimal, with sporadic Crack Willow (*Salix fragilis*) shrubs only of note.

The boundary hedges of the surrounding fields predominantly consist of Hawthorn (*Crataegus monogyna*), Dog Rose (*Rosa canina*) and Bramble (*Rubus fruticosus*), with also occasional Oak (*Quercus robur*), Ash (*Fraxinus excelsior*), and Sycamore (*Acer pseudoplatanus*). Notably, many of the hedge-lines are shown on the Ordnance Survey map of 1888, thus indicating their longevity, and also that possibly of some of their tree-species, indeed the Fomarts Lane access route and field boundaries is lined by numerous mature trees, including Beech (*Fagus sylvatica*) and, notably several Hornbeam (*Carpinus betulus*), a relatively scarce species in Northern England.

The small areas of marshland on the fringes of the lake and its numerous islands support a range of aquatic and marginal species. These include: Meadowsweet (*Filipendula ulmaria*), Greater Willowherb (*Epilobium hirsutum*), Watermint (*Mentha aquatica*), Ladies Smock (*Cardamine*



pratensis), Northern Marsh Orchid (*Dactylorhiza purpurella*), Common Spotted Orchid (*Dactylorhiza fuchsii*), Brooklime (*Veronica beccabunga*), Water Forget-me-not (*Myosotis scorpioides*), Water Avens (*Geum rivale*), Great Burnet (*Sanguisorba officinalis*), Jointed Rush (*Juncus articulatus*), Greater Spearwort (*Ranunculus lingua*), Lesser Spearwort (*Ranunculus flammula*), Valerian (*Valeriana officinalis*), Cattail (*Typha latifolia*) and Pondweed (*Potamogeton spp.*).

The drier areas around the lake support a wide range of species dominated by Speedwell (*Veronica spp.*), as well as Thistle (*Cirsium spp.*), St John's Wort (*Hypericum spp.*) and Cowslip (*Primula veris*). A field survey to assess the condition of lowland fen habitat in the Durham Magnesian Limestone Natural Area was carried out in September 2007, and included Castle Lake, its swampy fringes and also some surrounding wetland habitat (referred to as Bishop Middleham Deer Park Lake in the report). Forty-six plant species were recorded as being present, with at least 30 plant species as being present, with Mare's-tail (*Hippuris vulgaris*) and Pink-Water Speedwell (*Veronica catenata*) thought to be particularly dominant around the fringes of the lake and swamp areas at the north end. The report made no comment of any significant flora recorded.

The field survey concluded that in 2007, Castle Lake was thought to be 'in early stages of development and it will become more diverse', and that 'vegetation is sparse and developing, but includes some marginal *Hippuris* swamp'. The management recommendation for the site was to 'maintain grazing to lake margins and continue to allow water levels to fluctuate' (Durham Magnesian Limestone Fen Inventory, 2008).

However, as Eales (2010) recorded, heavy grazing can have a detrimental effect. That carried out within the redundant operational zone of the sewage treatment facility had produced an area of negligible botanical interest.



Reed beds in the south-west corner of Castle Lake (John Olley) Castle Lake, looking north – highlights grasslands surrounding the lake, and the comparative lack of vegetated lake shore (Neil Fawcett)



3.4 Biological – Flora (Surrounding Grassland and Pasture)

A comprehensive inventory semi-natural grasslands carried out during the summer of 2006 (Stobbs & Durkin, 2007) of the Sedgefield area included several sites around Bishop Middleham, including Bishop Middleham Castle Field. This was identified as a particularly rich grassland habitat that supported a wide range of significant flora.

The field is particularly noteworthy as 'it consists of dry and generally calcareous grassland with the better flora coinciding with areas of stone originating from the Castle foundations there are some steep gradients within the field which, together with the grazing regime, have helped to keep the grassland generally short'. Recommended management of Castle Field suggested that the current grazing regime was 'satisfactory' and that there should be no variation to this.

Fieldwork surveys of a small field north of Castle Field in 2006 observed it to be 'a rather neglected field which is ungrazed at the present time. The only species of interest is Crosswort (*Cruciata laevipes*)', but that the 'flora of this field would be helped by the adoption of an appropriate grazing regime. Outside, but adjacent to the 'Castle Lake' site, surveys were carried out on a number of other fields, although they were, from a botanical perspective, found to be of 'no interest' (Stobbs & Durkin, 2007).

Given the ability of new plants to appear via windborne seeds, it is noteworthy that a number of other fields and sites near to Castle Lake are of great botanical interest, particularly for magnesian limestone grassland species. These include areas adjacent to the former Bishop Middleham pit workings and the Bishop Middleham Quarry Nature Reserve, a SSSI currently managed by Durham Wildlife Trust for its nationally recognised plant life and large numbers of butterfly species.

Fieldwork carried out by Stobbs and Durkin (2007) recorded the following species within Castle Field:

Magnesian Limestone flora:

Yarrow (*Achillea millefolium*)

Daisy (*Bellis perrenis*)

Quaking Grass (*Briza media*)

Harebell (*Campanula rotundifolia*)

Shephers purse (*Capsella bursa-pastoris*)

Musk Thistle (*Carduus nutans*)

Fern Grass (*Catapodium rigidum*)

Common Mouse ear (*Cerastium fontanum*)



Creeping Thistle (*Cirsium arvense*)
Pignut (*Conopodium majus*)
Crosswort (*Cruciata laevipes*)
Crested dogs tail (*Cynosurus cristatus*)
Cocks-foot (*Dactylis glomerata*)
Sheep's fescue (*Festuca ovina*)
Lady's bedstraw (*Galium verum*)
Doves-foot cranesbill (*Geranium molle*)
Autumnal hawkbit (*Leontodon autumnalis*)
Fairy flax (*Linum catharticum*)
Perennial rye grass (*Lolium perenne*)
Birds foot trefoil (*Lotus corniculatus*)
Pineapple weed (*Matricaria discoidea*)
Black medic (*Medicago lupulina*)
Common restharrow (*Ononis repens*)
Redshank (*Persicaria maculosa*)
Timothy (*Phleum pratense*)
Mouse ear-hawkweed (*Pilosella officinarum*)
Ribwort plantain (*Plantago lanceolata*)
Greater plantain (*Plantago major*)
Hoary plantain (*Plantago media*)
Rough meadow grass (*Poa trivialis*)
Tormentil (*Potentilla erecta*)
Creeping cinquefoil (*Potentilla reptans*)
Selfheal (*Prunella vulgaris*)
Meadow buttercup (*Ranunculus acris*)
Common sorrel (*Rumex acetosa*)
Salad burnet (*Sanguisorba minor*)
Prickly sow thistle (*Sonchus asper*)
Dandelion (*Taraxacum aggregate*)
Wild thyme (*Thymus polytrichus*)
Red clover (*Trifolium pratense*)
White clover (*Trifolium rapens*)
Stinging nettle (*Urtica dioica*)
Heath speedwell (*Veronica officinallis*)

Other flora noted across the Castle Lake site include important broad-leaved herbs with Common Bird's-foot-trefoil (*Lotus corniculatus*), Hare Bell (*Campanula rotundifolia*), Cowslip (*Primula veris*), Salad Burnet (*Sanguisorba minor*) and Wild Thyme (*Thymus polytrichus*) all prominent.

Less common species include Common Milkwort (*Polygala vulgaris*), Common Dog Violet (*Viola riviniana*), Wild Carrot (*Daucus carota*) and Musk Thistle (*Carduus nutans*). The more heavily grazed pasture holds predominantly Creeping Thistle (*Cirsium arvense*), Spear Thistle (*Cirsium vulgare*), Black Knapweed (*Centaurea nigra*), Common Daisy (*Bellis perennis*), Dandelion (*Taraxacum officinale*) and Dock (*Rumex patientia*).



Musk Thistle (Julie Hogg) and Hare Bell, a magnesian limestone specialist (John Olley), Castle Field – illustrates earthworks of Bishop Middleham Castle, previous quarrying activity and exposed magnesian limestone (Fred Milton).



3.6 Invertebrates

Damselflies and Dragonflies:

- Common Blue (*Enallagma cyathigerum*)
- Large Red Damselfly (*Pyrrhosoma nymphula*)
- Blue-tailed Damselfly (*Ischnura elegans*)
- Common Sympetrum (*Sympetrum striolatum*)
- Common Aeshna (*Aeshna juncea*).
- Four-spotted Chaser (*Libellula quadrimaculata*)
- Common Darter (*Sympetrum striolatum*)

Given the wet habitat of Castle Lake and the availability of multiple shallow pools, it is noted there is definitely under recording of species of damselflies and dragonflies.

Lepidoptera:

- Small White (*Pieris rapae*)
- Large White (*Pieris brassicae*)
- Green Veined White (*Pieris napi*)
- Meadow Brown (*Maniola jurtina*)
- Ringlet (*Aphantopus hyperantus*)
- Speckled Wood (*Pararge aegeria*)
- Red Admiral (*Vanessa atalanta*)
- Painted Lady (*Vanessa cardui*)
- Small Tortoiseshell (*Aglais urticae*)
- Wall Brown (*Lassiomatta megera*)
- Comma (*Polygonia c-album*)
- Common Blue (*Polymattus icarus*)
- Small Skipper (*Thymelicus sylvestris*)
- Large Skipper (*Ochlodes sylvanus*)
- Peacock (*Aglais io*)
- Small Copper (*Lycaena phlaeas*)
- Orange Tip (*Anthocharis cardamines*)

UK butterflies have undergone significant declines since the mid-1970s; indeed, 76% of the UK's resident and common migrants butterfly species have decreased in abundance over the past 40 years, with species on farmland recording a 57% decline in the period 1990-2014 (Fox *et al*, 2015).

Butterflies are under-recorded at Castle Lake, especially given the presence of magnesian limestone grassland habitat; this is highly attractive to several butterfly species, including some



scarce species, as shown by the wide variety of butterflies, including Northern Brown Argus (*Aricia artaxerxes*), recorded at nearby Bishop Middleham Quarry SSSI to the north of Castle Lake. Those butterfly species recorded at Castle Lake are relatively common species, with no significant records or numbers of note recorded. Despite the rather negative assessment of the ecological value of the adjacent sewage treatment works, nine species of butterfly were recorded during the course of a 2010 survey, although there was no evidence of any breeding taking place owing to the rather sparse and monoculture herbage (Eales, 2010).



Common Blue (John Olley)

3.7 Amphibians

Smooth Newt (*Triturus vulgaris*)
Common Frog (*Rana temporaria*)
Common Toad (*Bufo bufo*).

3.8 Mammals

Roe Deer (*Capreolus capreolus*)
Water Vole (*Arvicola amphibius*)
Brown Rat (*rattus norvigicus*)
Mole (*Talpa europaea*)
Eurasian Hedgehog (*Erinaceus europaeus*)
Rabbit (*Oryctolagus cuniculus*)
Brown Hare (*Lepus europeus*)
Fox (*Vulpes vulpes*)
Badger (*Meles meles*)
Stoat (*Mustela erminea*)



Weasel (*Mustela nivalis*)

Brown Long-eared Bat (*Plecotus auritus*)

Daubenton's Bat (*Myotis daubentonii*)

Noctule Bat (*Nyctalus noctula*)

Common Pipstrelle Bat (*Pipistrellus pipistrellus*)

Mammals are under-recorded at Castle Lake: for example, notable by their absence are any formal records of any species of mouse, vole or shrew, which, given the habitat and regular sightings of birds of prey and owls, are undoubtedly present in some numbers.

It is highly likely that Otter (*Lutra lutra*) is also present, given the size of water body, availability of food, and the nearby Still drain and River Skerne watercourses. Water Vole is probably the most significant mammal species recorded, with individuals noted in the lake and also the River Skerne. The population of Water Voles has undergone rapid decline, due to habitat destruction, the intensification of agriculture, water pollution and the spread of the introduced American Mink (*Neovison vison*).

Recent surveys suggested a loss of 67.5% of occupied sites and 88% of the remaining population in only seven years (Battersby, 2005). Therefore, any records at Castle Lake are important. Three species of bat have been definitely recorded at Castle Lake, although it is unlikely that any breed or roost there, given the lack of suitable locations.

Bishop Middleham village offers ideal bat roosting/breeding habitat, and an active Noctule roost was noted at a farm to the north of village in 2002, although the roost site was later destroyed by high winds. Interestingly, archaeological records also suggest the presence of Wolves (*Canis lupus*) at Bishop Middleham with bones thought to be this species found in an excavated cave, and most certainly to be dated as pre-medieval or earlier. It is also believed that the species of deer kept in the deer park, were Fallow Deer (*Dama dama*). This species is still housed in the deer parks at Raby Castle and Whitworth Park (Coult, 2012).



Roe Deer, October 2015 (Neil Fawcett)



3.9 Birds

It is for its birdlife that Castle Lake is quite rightly renowned. A total of 183 bird species (not including those birds regarded as 'escapes', generally wildfowl) have been recorded at Castle Lake, with an exceptional 150 species recorded during in around the site in 2011.

During summer and autumn, it is quite possible to see 60-70 species at the site and in its immediate locale and over the relative short lifespan of the site, 30 species of waders have been reported. Considerable and increasing numbers of birds, but especially waterfowl and waders have continued to be recorded over the past 20 years, especially during migration periods and the winter. Indeed, away from the Tees marshes, Castle Lake regularly records the highest counts of non-estuarine wildfowl and waders in the county.

Being generally sparsely vegetated and lacking dense widespread scrub and tree cover, numbers of breeding birds, given the size of the site, are quite low, but there are still notable species breeding at Castle Lake. Birds recorded include significant numbers of species that are considered to be 'Birds of Conservation Concern' (Eaton et al, 2015) and/or UK Biodiversity Action Plan Priority Species (JNCC/Defra, 2007) as well as several farmland species, whose national breeding populations have undergone steep declines.

Additionally, there are also significant records of species ranked as Schedule One breeding bird species and given special protection during the breeding season (BTO: List of Protected Birds). Castle Lake is also highly regarded for its ability to attract regular scarce and rare bird species, which can draw large numbers of admiring observers.

Habitat improvements carried out by Durham Bird Club have led to real increases in bird diversity and breeding populations; for example, the creation of a reed bed at the south end of the lake and the installation of tern rafts have attracted, respectively, breeding Reed Warbler and Common Tern. It is important to stress that all management and habitat improvement work, although funded from external support, has been done with the informal agreement of landowner and Durham Bird Club.

Geographically, there is an important movement of birds on a flyway between the Bishop Middleham wetland system and the east coast, especially to and from RSPB Saltholme and other inland wetlands, such as Hurworth Burn Reservoir to the northeast. This movement is a daily occurrence, comprising of large flocks of gulls, wildfowl and waders. Locally, there is obvious bird movement between Castle Lake and the other neighboring wetlands surrounding the village and the wider River Skerne watershed: for example, Ferryhill Carrs to the west and Hardwick Park to the south. Those sites neighboring Castle Lake (Stoney Beck Lake, A1 Flashes and Fishburn Lake)



are very important, if disturbance occurs, for feeding, roosting and bathing, interspecific and intraspecific interactions. Additionally, the rich mosaic of non-wetland habitat surrounding the site (for example, scrub woodland, several disused railway lines that also offer 'green corridors', agricultural fields and the actual village of Bishop Middleham with its mosaic of gardens, parkland and built environ, including several farmsteads) supports a wide variety of breeding and passage passerine species subsequently recorded at Castle Lake such as Swallow, Willow Warbler, Common Whitethroat and Yellow Wagtail.



Curlew - a red listed species of conservation concern. Up to 500 winter in the Bishop Middleham area (John Olley) & Wigeon, a common passage and wintering wildfowl (Ben Lyons)

Castle Lake and its surrounds supports a significant community of birds, particularly wetland and farmland species. A full list of the 183 species of birds recorded, including their Latin nomenclatures, their occurrence status at Castle Lake and their Conservation Concern designation is provided in Appendix 1. A seasonal overview of the birds found at Castle Lake throughout the year is provided below to provide additional context to this data.

Winter: During particularly cold winters, the whole lake can freeze, but the area can still attract large concentrations of wildfowl and waders that utilise the lake and surrounding pasture during this period. The livestock grazing regime that provides closely cropped grassland up to the water's edge is especially important for wildfowl species as it provides not only unhindered sightlines for the birds to spot potential predators such as Fox, but also ideal grazing opportunities.

Wigeon especially take advantage of this grazing habitat, with up to 1,000 birds being counted in 2017. Other species of wildfowl found in significant numbers include Teal (300 in January 2015), Mallard, Gadwall (82 in February 2015) and Coot (280 in March 2015). Smaller numbers of Goldeneye are present through the season, with occasional records of the scarce Scaup, Goosander and Smew. Whooper Swan and six species of geese can be seen during the winter



months, with small numbers of the relatively scarce Bean Goose and White Front Goose recorded on an annual basis.

Significant numbers of waders also are also recorded during the coldest part of the year months. This includes Curlew (502 counted in February 2015), Lapwing with a maximum count of 2,500 in 2017 and Golden Plover with up to 900 present in February 2015 as birds probably moved through the area on their return to uplands breeding areas.

The site is equally important for passerine farmland species with flocks of circa 50 birds of Goldfinch, Pied Wagtail and Tree Sparrow throughout the winter months, with the hedgerows and pastures also attracting flocks of Fieldfare and Redwing, which can sometimes number hundreds. Attracted by large numbers of potential prey, Sparrowhawk, Merlin and Peregrine are seen through the winter months, with Short Eared Owl also frequent, and Hen Harrier occasionally being observed (singles were noted in March and April 2014) and a Rough Legged Buzzard also recorded in October 2011. Upwards of 4-5 Common Buzzards are frequently seen above and around the site, with the later species being seen throughout the year and breeding locally.



Short Eared Owl – an occasional winter visitor to the grasslands surrounding Castle Lake. Whooper Swan – an annual winter visitor (Neil Fawcett).

Spring: After more settled numbers during winter, during spring, there is a very visible movement of birds through Castle Lak, as winter visitors depart and spring migrants arrive. There is also a small migration northwards of waders, and most records of just 1-2 birds and include Green Sandpiper, Ruff, Black Tailed Godwit and Wood Sandpiper.

There is also a small spring migration of wildfowl through the site, with Wigeon and Teal lingering until May, until they move northwards to breed. The wet grassland around the lake and surrounding arable areas is also especially attractive to Yellow Wagtail and an estimated 1-5 pairs of this very attractive bird breed at the site. In addition, several nominate races of Yellow Wagtail,



including 'Channel' Wagtail and 'Blue Headed' Wagtail are annually seen on spring passage and occasional scarce species such as Red Rumped Swallow, recorded in 2009, whilst in May 2011, Spoonbill, Temminck's Stint and Quail were all recorded.

Summer: Number of birds during the summer months are generally at their lowest during the year as birds get on with arduous process of breeding and then immediately undertake a moult as old feathers are replaced. Castle Lake and its surrounding pastures are important breeding areas for several scarce breeding species with locally significant populations of Durham Biodiversity Action Plan (DBAP) and Red and Amber Birds of Conservation Concern.²

Breeding species include: Lapwing with up to 10 pairs in 2016, and 1-2 pairs Redshank. Schedule One species that currently breed on an annual basis include 1-2 pairs of Little Ringed Plover and Kingfisher.³ Approximately 1,200 pairs of Little Ringed Plover breed in the UK (Hayhow *et al*, 2017), and this species is seen annually. Breeding has been recorded; a week-old chick noted in August 2016. Of more significance, in 2014, a pair of Black Necked Grebes also bred successfully, with two young birds fledged.

The current breeding population of Black Necked Grebes in Britain is estimated to be only 52 pairs. Therefore, it is highly significant that the species has bred successfully at Castle Lake. The site offers ideal breeding habitat, as a shallow lowland water body with copious submerged plants. As the species is recorded annually at the site, breeding again in the near future is highly likely (Bowey & Newsome, 2012; Hayhow *et al*, 2017). Both Little Grebe and Great Crested Grebe also successfully breed on an annual basis, with approximately 1-3 pairs per species.

The summer months are generally regarded as quiet as most bird species get on with the arduous task of breeding and then undergo post-breeding moults, but the season is not without rare birds. For example, during 2016, Common Scoter and Little Tern were recorded. It is very unusual to find either species away from the coast, and this further underlines the site's proclivity for attracting a wide range of birds. Small numbers of Little Egret may be seen throughout the year, and although they do not breed at Castle Lake, they use the site as a 'stopping off' point to feed. A good example of this was a bird ringed as a nestling in Norfolk in May 2009, which then was seen at Castle Lake (241 km north of place of hatching) in mid-Jul 2009 and then at Saltholme Pools in late August the same year (Clark *et al*, 2009)

² A 'traffic light' system is in place to signify 'species of conservation concern'. Those species accorded 'red' status are regarded as 'Globally Threatened', and have undergone a severe decline in the UK breeding population size (>50%) over 25 years. Species given 'amber' status are considered to have undergone a moderate population/breeding decline (>25% but <50%) over 25 years. (Eaton *et al*, 2015).

³ Schedule One Species are birds and their young, for which it is an offence to intentionally or recklessly disturb at, on or near an 'active' nest.



Spoonbill - a rare spring visitor, May 2011. Wheater - an annual spring and autumn migrant (Neil Fawcett)

A wide variety of common waterbirds breed regularly at Castle Lake (see **Appendix 1**), with perhaps Tufted Duck and Gadwall being the most common breeding duck species. In July 2014, an impressive count of 70 Gadwall ducklings were recorded, from possibly 10-12 pairs of this locally increasing duck species.

The addition of targeted 'tern rafts' has paid immediate dividends with 1-2 pairs of Common Terns breeding on an annual basis. Importantly, a number of farmland species, whose UK populations are declining, also occur across the site. This includes up to 10 pairs of Corn Bunting. This is highly significant and should not be underestimated.

Bishop Middleham is the only remaining stronghold in the county of this now very rare farmland species whose national population has undergone a major decline of 86% between 1967 and 2008. Indeed, in adjacent Northumberland and Cleveland, the breeding population has all-but collapsed. Agricultural change, coupled with the lack of winter stubbles for feeding and low breeding productivity are thought to be the cause (Bowey & Newsome, 2012).

Other species that have good breeding populations include: Tree Sparrow (whose numbers have been assisted through the provision of nest boxes by Durham Bird Club), Linnet, Yellowhammer, Skylark, Reed Bunting and Grey Partridge. All of these farmland species, with the exception of Linnet, are regarded as 'Red' Birds of Conservation Concern (Eaton *et al.* 2015). During summer, the lake is also highly attractive for large numbers, often in the hundreds, of feeding Swift, Swallow, House Martin and Sand Martin, all of whom breed in the surrounding locale. Such large gatherings naturally attract predators, and Hobby is recorded on an annual basis, with breeding suspected nearby.



Yellow Wagtail - a relatively common summer visitor, with small numbers breeding annually, May 2015 and Green Sandpiper - a common spring and autumn passage wader (Neil Fawcett).

Autumn: It is during autumn that the greatest concentrations of birds can be seen at Castle Lake. Important numbers of autumn passage of wildfowl and waders, including some very scarce species, are noted annually across the area, with the lake being an important feeding station for often many thousands of migrating birds at any one time.

Movements of waders and duck species include birds moving out of their Pennine breeding areas, for example, Golden Plover and Lapwing, counts of which regularly exceed 500 and 1,000 respectively throughout the autumn, and also birds from much further afield, such as those breeding in the high Arctic.

Most of these birds rely on wetlands to feed up for their journeys back to Africa and they can be very prominent during this period, and some counts, such as Curlew Sandpiper, can exceed those recorded on the much larger North Tees Marshes complex. Wader species that are now annual visitors, some in quite significant numbers, include upwards of 10 Greenshank; generally 1-2 Spotted Redshank; up to 5 Little Stint; Dunlin, Black Tailed Godwit, Whimbrel; Curlew Sandpiper (11 counted in August 2016); Common Sandpiper; upwards of 10 Green Sandpiper; Wood Sandpiper and Ruff (51 recorded in August 2015).

Further emphasising Castle Lake's attraction to migratory waders, rare species recorded during the autumn included scarce visitors from North America and Siberia such as Pectoral Sandpiper, which has been recorded on six occasions since 2000, and an adult female Wilson's Phalarope that lingered for two days in August 2007. Other scarce species recorded in autumn include Honey Buzzard (September 2008), Bittern and Black Tern (both September 2011).

The autumn also sees a large influx of geese species into the UK as they migrate from their northerly breeding areas. Castle Lake attracts good numbers of passage and wintering Canada Geese (several hundred are present throughout the autumn, with 500 in August 2012), Pink



Footed Geese (76 in November 2016), White Fronted Geese and Greylag Geese (which regularly exceed 1,000 plus birds in November), with Bean Geese being recorded on an annual basis, and the first record of a single Brent Goose recorded in October 2016.

Duck numbers also begin to build through the autumn with over a thousand ducks of upwards of 10 species regularly on the lake and its surrounds throughout the autumn. Noteworthy individual species counts include 120 Gadwall (September 2012), 640 Teal (September 2013), 220 Mallard (October 2014) and 410 Wigeon (October 2013). Both Little Grebe and Coot are present throughout the year. Both breed annually, but during autumn post-breeding gatherings see significant numbers of both species recorded. For example, 44 Little Grebe were present in September 2013 which exceeded the maximum numbers recorded that year on the North Tees Marshes, and in August 2014, Coot numbers peaked at a six year high (2010-15) of 304 birds.



Pink Footed Goose - a regular autumns and winter specie. Ruff (juvenile) - an annual spring and autumn migrant in small numbers. (Neil Fawcett)



Appendix 1: Bird Species Recorded at Castle Lake

The listing below details sightings of birds recorded at ‘Bishop Middleham’. It is difficult to assess with some certainty whether sightings have been made within the Castle Lake site boundary, as defined within this report, or adjacent sites within the wider Bishop Middleham recording area. All available Bishop Middleham sightings, where possible, are thus included within this listing for completeness. Bird records are drawn in the main from Durham Bird Club annual reports and BTO Wetland Bird Survey (WeBs) data, but also the personal records of local observers.

Species	Latin nomenclature	BTO Code	Conservation Concern	Status / numbers	Peak Autumn/ Winter counts & Remarks
Mute Swan	<i>Cygnus olor</i>	MS	Amber	Uncommon breeder	12
Bewick’s Swan	<i>Cygnus columbianus</i>	BS	Amber	Rare winter 1-20	
Whooper Swan	<i>Cygnus cygnus</i>	WS	Amber	Annual winter visitor 1-20	30
Bean Goose	<i>Anser fabalis</i>	BE	Amber	Annual winter visitor 1-20	
Pink Footed Goose	<i>Anser brachyrhynchus</i>	PG	Amber	Annual winter visitor 1-100	50
White Fronted Goose	<i>Anser albifrons</i>	WG	Red	Annual winter visitor 1-20	10
Canada Goose	<i>Branta canadensis</i>	CG	Green	Common breeder 1-10 pairs	300
Barnacle Goose	<i>Branta leucopsis</i>	BY	Amber	Annual winter visitor 1-20	
Greylag Goose	<i>Anser anser</i>	GJ	Amber	Common breeder 1-5 pairs	700
Brent Goose	<i>Branta bernicla</i>	BG	Amber	Rare visitor	Single 2016
Egyptian Goose	<i>Alopochen aegyptiacus</i>	EG	Green	Rare visitor	
Shelduck	<i>Tadorna tadorna</i>	SU	Amber	Common breeder 1-5 pairs	40
Wigeon	<i>Anas penelope</i>	WN	Amber	Annual winter visitor 1000+	1000
Gadwall	<i>Anas strepera</i>	GA	Amber	Common breeder 1-15 pairs	120
Teal	<i>Anas crecca</i>	T.	Amber	Annual winter visitor 800+	800
Mallard	<i>Anas platyrhynchos</i>	MA	Amber	Common breeder 1-5 pairs	150
Pintail	<i>Anas acuta</i>	PT	Amber	Annual winter visitor 1-10	6
Garganey	<i>Anas querquedula</i>	GY	Amber	Rare breeder 1-2 pairs	
Shoveler	<i>Anas clypeata</i>	SV	Amber	Common breeder 1-3 pairs	30
Red Crested Pochard	<i>Netta rufina</i>	RQ	Amber	Rare visitor	
Pochard	<i>Aythya ferina</i>	PO	Red	Common breeder 1-3 pairs	20
Tufted Duck	<i>Aythya fuligula</i>	TU	Green	Common breeder 1-10 pairs	100
Scaup	<i>Aythya marila</i>	SP	Red	Rare visitor	2
Common Scoter	<i>Melanitta nigra</i>	CX	Red	Rare visitor	
Goldeneye	<i>Bucephala clangula</i>	GN	Amber	Annual winter visitor 1-10	5
Smew	<i>Mergus albellus</i>	SY	Amber	Rare visitor	
Goosander	<i>Mergus merganser</i>	GD	Green	Annual winter visitor 1-5	5
Ruddy Duck	<i>Oxyura jamaicensis</i>	RY	Green	Rare visitor	
Quail	<i>Coturnix coturnix</i>	Q	Amber	Rare visitor	Single May 2011
Grey Partridge	<i>Perdix perdix</i>	P	Red	Common breeder 1-3 pairs	14
Pheasant	<i>Phasianus colchicus</i>	PH	Green	Common visitor	



Gannet	<i>Morus bassanus</i>	GX	Green	Rare visitor	Single Oct 2011
Cormorant	<i>Phalacrocorax carbo</i>	CA	Green	Annual winter 1-10	10
Bittern	<i>Botaurus stellaris</i>	BI	Amber	Rare visitor	Single Sept 2011
Little Egret	<i>Egretta garzetta</i>	ET	Green	Common visitor	6
Grey Heron	<i>Ardea cinerea</i>	H	Green	Common visitor	6
White Stork	<i>Ciconia ciconia</i>	OR	Amber	Rare visitor	
Little Grebe	<i>Tachybaptus ruficollis</i>	LG	Green	Common breeder 1-5 pairs	40
Great Crested Grebe	<i>Podiceps cristatus</i>	GG	Green	Common breeder 1-3 pairs	10
Red Necked Grebe	<i>Podiceps grisegena</i>	RX	Red	Rare visitor	Single Nov 2011
Black Necked Grebe	<i>Podiceps nigricollis</i>	BN	Amber	Rare breeder	2
Honey Buzzard	<i>Pernis apivorus</i>	HZ	Amber	Rare visitor	
Marsh Harrier	<i>Circus aeruginosus</i>	MR	Amber	Common visitor	
Hen Harrier	<i>Circus cyaneus</i>	HH	Red	Rare visitor	
Goshawk	<i>Accipiter gentilis</i>	GI	Green	Rare visitor	
Sparrowhawk	<i>Accipiter nisus</i>	SH	Green	Common visitor	
Buzzard	<i>Buteo buteo</i>	BZ	Green	Common visitor	
Rough Legged Buzzard	<i>Buteo lagopus</i>	RF	Amber	Rare visitor	
Osprey	<i>Pandion haliaetus</i>	OP	Amber	Rare visitor	
Water Rail	<i>Rallus aquaticus</i>	WA	Green	Rare visitor	
Moorhen	<i>Gallinula chloropus</i>	MH	Green	Common breeder 1-5 pairs	20
Coot	<i>Fulica atra</i>	CO	Green	Common breeder 1-15 pairs	200
Common Crane	<i>Grus grus</i>	AN	Amber	Rare visitor	Single Sept 1999
Avocet	<i>Recurvirostra avosetta</i>	AV	Amber	Annual visitor 1-10	6
Oystercatcher	<i>Haematopus ostralegus</i>	OC	Amber	Common breeder 1-3 pairs	40
Golden Plover	<i>Pluvialis apricaria</i>	GP	Green	Annual winter visitor 900+	1000
Grey Plover	<i>Pluvialis squatarola</i>	GV	Amber	Rare visitor	
Lapwing	<i>Vanellus vanellus</i>	L	Red	Common breeder 1-15 pairs. Annual winter visitor 2000+	3000
Little Ringed Plover	<i>Charadrius dubius</i>	LP	Green	Common breeder 1-3 pairs	20
Ringed Plover	<i>Charadrius hiaticula</i>	RP	Red	Annual visitor 1-10	10
Whimbrel	<i>Numenius phaeopus</i>	WM	Red	Annual visitor 1-30	5
Curlew	<i>Numenius arquata</i>	CU	Red	Annual winter visitor 400+	500
Black Tailed Godwit	<i>Limosa limosa</i>	BW	Red	Annual visitor 1-30	20
Bar Tailed Godwit	<i>Limosa lapponica</i>	BA	Amber	Rare visitor	
Turnstone	<i>Arenaria interpres</i>	TT	Amber	Rare visitor	
Knot	<i>Calidris canutus</i>	KN	Amber	Rare visitor	Singles Aug 2011 & 2012
Ruff	<i>Philomachus pugnax</i>	RU	Red	Annual visitor 1-30	30
Curlew Sandpiper	<i>Calidris ferruginea</i>	CV	Amber	Annual	1-10
Temminck's Stint	<i>Calidris temminckii</i>	TK	No assessment	Rare visitor	Single 2011
Sanderling	<i>Calidris alba</i>	SS	Amber	Rare visitor	
Dunlin	<i>Calidris alpina</i>	DN	Amber	Annual visitor 1-30	30
Little Stint	<i>Calidris minuta</i>	LX	Amber	Annual visitor 1-5	2
Pectoral Sandpiper	<i>Calidris melanotos</i>	PP	Amber	Rare visitor	



Wilsons Phalarope	<i>Phalaropus tricolor</i>	WF	Amber	Rare visitor	Adult female Aug 2007
Common Sandpiper	<i>Actitis hypoleucos</i>	CS	Green	Annual visitor 1-10	10
Green Sandpiper	<i>Tringa ochropus</i>	GE	Amber	Annual visitor 1-10	12
Spotted Redshank	<i>Tringa erythropus</i>	DR	Amber	Annual visitor 1-3	
Greenshank	<i>Tringa nebularia</i>	GK	Amber	Annual visitor 1-10	10
Wood Sandpiper	<i>Tringa glareola</i>	OD	Amber	Annual visitor 1-3	2
Redshank	<i>Tringa totanus</i>	RK	Amber	Rare breeder 1-2 pairs	40
Jack Snipe	<i>Lymnocyptes minimus</i>	JS	Amber	Rare visitor	
Snipe	<i>Gallinago gallinago</i>	SN	Amber	Annual visitor 1-100	100
Little Tern	<i>Sterna albifrons</i>	AF	Amber	Rare visitor	
Black Tern	<i>Chlidonias niger</i>	BJ	Amber	Rare visitor	
Common Tern	<i>Sterna hirundo</i>	CN	Amber	Rare breeder 1-2 pairs	10
Arctic Tern	<i>Sterna paradisaea</i>	AE	Amber	Rare visitor	
Black Headed Gull	<i>Chroicocephalus ridibundus</i>	BH	Amber	Rare breeder 1-2 pairs	500
Little Gull	<i>Hydrocoloeus minutus</i>	LU	Amber	Rare visitor	
Mediterranean Gull	<i>Larus melanocephalus</i>	MU	Amber	Rare visitor	
Common Gull	<i>Larus canus</i>	CM	Amber	Annual winter visitor 300+	300
Ring Billed Gull	<i>Larus delawarensis</i>	IN		Rare visitor	
Lesser Blacked Back Gull	<i>Larus fuscus</i>	LB	Amber	Common summer visitor 1-10	20
Herring Gull	<i>Larus argentatus</i>	HG	Red	Annual winter visitor 20+	40
Yellow Legged Gull	<i>Larus michachellis</i>		Amber	Rare visitor	
Glaucous Gull	<i>Larus hyperboreus</i>	GZ	Amber	Rare visitor	
Great Blacked Back Gull	<i>Larus marinus</i>	GB	Amber	Annual winter visitor 1-5	2
Feral Pigeon	<i>Columba livia</i>	FP	Green	Common visitor	
Stock Dove	<i>Columba oenas</i>	SD	Amber	Common breeder 1-3 pairs	20
Wood Pigeon	<i>Columba palumbus</i>	WP	Green	Common visitor	10
Collard Dove	<i>Streptopelia decaocto</i>	CD	Green	Rare visitor	
Turtle Dove	<i>Streptopelia turtur</i>	TD	Red	Rare visitor	
Cuckoo	<i>Cuculus canorus</i>	CK	Red	Annual visitor	
Barn Owl	<i>Tyto alba</i>	BO	Green	Rare visitor	
Little Owl	<i>Athene noctua</i>	LO	Green	Local breeder 1-2 pairs	
Tawny Owl	<i>Strix aluco</i>	TO	Amber	Local breeder 1-2 pairs	
Long Eared Owl	<i>Asio otus</i>	LE	Green	Rare visitor	
Short Eared Owl	<i>Asio flammeus</i>	SE	Amber	Uncommon visitor	
Swift	<i>Apus apus</i>	Si	Amber	Annual visitor	200
European Bee-eater	<i>Merops apiaster</i>	MZ		Rare visitor	Bred at nearby Bishop Middleham Quarry in 2002
Kingfisher	<i>Alcedo atthis</i>	KF	Amber	Local breeder 1-2 pairs and visitor	
Green Woodpecker	<i>Picus viridis</i>	G.	Green	Rare visitor	
Great Spotted Woodpecker	<i>Dendrocopus major</i>	GS	Green	Annual visitor	
Lesser Spotted Woodpecker	<i>Dryobates minor</i>	LS	Red	Rare visitor	
Kestrel	<i>Falco tinnunculus</i>	K	Amber	Common visitor	



Merlin	<i>Falco subbuteo</i>	ML	Red	Rare winter visitor	
Hobby	<i>Falco subbuteo</i>	HY	Green	Rare visitor	
Peregrine	<i>Falco peregrinus</i>	PE	Green	Common visitor	
Magpie	<i>Pica pica</i>	MG	Green	Common breeder 1-2 pairs	
Jay`	<i>Garrulus glandarius</i>	J	Green	Rare visitor	
Jackdaw	<i>Corvus monedula</i>	JD	Green	Common breeder 1-2 pairs	600
Rook	<i>Corvus frugilegus</i>	RO	Green	Common breeder 1-2 pairs	100
Carrion Crow	<i>Corvus corone</i>	C	Green	Common breeder 1-2 pairs	20
Raven	<i>Corvus corax</i>	RN	Green	Rare visitor	
Goldcrest	<i>Regulus regulus`</i>	GC	Green	Annual visitor	
Firecrest	<i>Regulus ignicapilla</i>	FC	Green	Rare visitor	Single, April 2016
Blue Tit	<i>Parus caeruleus</i>	BT	Green	Common breeder 1-2 pairs	
Great Tit	<i>Parus major</i>	GT	Green	Common breeder 1-2 pairs	
Coal Tit	<i>Parus ater</i>	CT	Green	Annual visitor	
Willow Tit	<i>Poecile montanus</i>	WT	Red	Annual visitor	
Skylark	<i>Alauda arvensis</i>	S	Red	Common breeder 30 pairs	40
Sand Martin	<i>Riparia riparia</i>	SM	Green	Annual visitor 300+	300
Barn Swallow	<i>Hirundo rustica</i>	SL	Amber	Common breeder 1-10 pairs	60
House Martin	<i>Delichon urbica</i>	HM	Amber	Annual visitor	30
Red Rumped Swallow	<i>Cecropis daurica</i>	VR	Amber	Rare visitor	Single, Apr 2009
Long Tailed Tit	<i>Aegithalos caudatus</i>	LT	Green	Common breeder 1-2 pairs	
Chiffchaff	<i>Phylloscopus collybita</i>	CC	Green	Annual visitor	
Willow Warbler	<i>Phylloscopus trochilus</i>	WW	Amber	Annual visitor	
Blackcap	<i>Sylvia atricapilla</i>	BC	Green	Common breeder 1-2 pairs	
Garden Warbler	<i>Sylvia borin</i>	GW	Green	Annual visitor	
Lesser Whitethroat	<i>Sylvia curruca</i>	LW	Green	Common breeder 1-3 pairs	
Whitethroat	<i>Sylvia communis</i>	WH	Green	Common breeder 1-5 pairs	
Grasshopper Warbler	<i>Loucustella naevia</i>	GH	Red	Rare visitor	
Sedge Warbler	<i>Acrocephalus schoenobaenus</i>	SW	Green	Rare breeder 1-2 pairs	
Reed Warbler	<i>Acrocephalus scirpaceus</i>	RW	Green	Rare breeder 1-2 pairs	
Waxwing	<i>Bombycilla garrulous</i>	WX	Green	Rare visitor	
Nuthatch	<i>Sitta europaea</i>	NH	Green	Annual visitor	
Treecreeper	<i>Certhia familiaris</i>	TC	Green	Common breeder 1-2 pairs	
Wren	<i>Trogladites trogladites</i>	WR	Green	Common breeder 1-5 pairs	
Starling	<i>Sturnus vulgaris</i>	SG	Red	Common breeder 1-2 pairs	1000
Ring Ouzel	<i>Turdus torquatas</i>	RO	Red	Rare visitor	
Blackbird	<i>Turdus merula</i>	B	Green	Common breeder 1-5 pairs	
Fieldfare	<i>Turdus pilaris</i>	FF	Red	Annual winter visitor 100+	200
Song Thrush	<i>Turdus philomelos</i>	ST	Red	Common breeder 1-5 pairs	
Redwing	<i>Turdus iliacus</i>	RW	Red	Annual winter visitor 200+	300
Mistle Thrush	<i>Turdus viscivorus</i>	M	Red	Common breeder 1-5 pairs	
Spotted Flycatcher	<i>Muscicapa striata</i>	SF	Red	Rare visitor	
Robin	<i>Erithacus rubecula</i>	R	Green	Common breeder 1-5 pairs	
Common Redstart	<i>Phoenicurus phoenicurus</i>	RT	Amber	Rare visitor	
Whinchat	<i>Saxicola rubetra</i>	WC	Red	Annual visitor	
Stonechat	<i>Saxicola torquata</i>	SC	Green	Rare visitor	
Wheatear	<i>Oenanthe oenanthe</i>	W	Green	Annual visitor	10
Dunnoek	<i>Prunella modularis</i>	D	Amber	Common breeder 1-5 pairs	



House Sparrow	<i>Passer domesticus</i>	HS	Red	Rare visitor	Common breeder in Bishop Middleham Village
Tree Sparrow	<i>Passer montanus</i>	TS	Green	Common breeder 1-10 pairs	30
Yellow Wagtail	<i>Motacilla flava</i>	YW	Red	Common breeder 1-5 pairs	30
Grey Wagtail	<i>Motacilla cinerea</i>	GL	Red	Annual winter visitor rare breeder	
Pied Wagtail	<i>Motacilla cervinus</i>	PW	Green	Common breeder 1-5 pairs	50
Meadow Pipit	<i>Anthus pretensis</i>	MP	Amber	Common breeder 1-5 pairs	30
Chaffinch	<i>Fringilla coelebs</i>	CH	Green	Common breeder 1-2 pairs	10
Bullfinch	<i>Pyrrhula pyrrhula</i>	BF	Amber	Common breeder 1-2 pairs	
Greenfinch	<i>Carduelis chloris</i>	GR	Green	Common breeder 1-2 pairs	
Linnet	<i>Carduelis cannabina</i>	Li	Red	Common breeder 1-10 pairs	100
Twite	<i>Linaria flavirostris</i>	TW	Red	Rare visitor	
Lesser Redpoll	<i>Carduelis cabaret</i>	LR	Red	Rare visitor	10
Crossbill	<i>Loxia curvirostra</i>	CR	Green	Rare visitor	
Goldfinch	<i>Carduelis carduelis</i>	GO	Green	Common breeder 1-2 pairs	200
Siskin	<i>Carduelis spinus</i>	SK	Green	Rare visitor	10
Snow Bunting	<i>Plectrophenax nivalis</i>	SB	Amber	Rare winter visitor	
Yellowhammer	<i>Emberiza citrinella</i>	Y	Red	Uncommon breeder 1-3 pairs	10
Reed Bunting	<i>Emberiza schoeniclus</i>	RB	Amber	Common breeder 1-10 pairs	20
Corn Bunting	<i>Emberiza calandra</i>	CB	Red	Common breeder 1-10 pairs	30



Comment on Potential of Site

This report has illustrated how today, Castle Lake with some site management, is a significantly important habitat for flora and fauna. Given this, it offers tremendous potential for large-scale habitat improvement via a broad suite of possible opportunities to enhance and manage the site's future potential. For example, the magnesian geology (particularly Castle Field) lends itself to restorative habitat works and the resultant probable biodiversity gain. The following proposals offer submissions on how the biodiversity of Castle Lake and its environs might be enhanced for not only wildlife through careful site management work, but also to improve the visitor experience, enhance educational opportunities and further appreciation of the site. It is recognised that there is a relative paucity of non-bird data available; therefore it is recommended that a full environmental survey and audit of the site is carried out as a matter of priority before any further works are carried out.

- Stobbs and Durkin (2009) suggested that the current grazing regime of Castle Field was 'satisfactory' and that there should be no variation to this. Further sympathetic grazing to be extended to other fields to encourage a richer botanical and fungi diversity and to explore environmental stewardship options for sympathetic management and restoration of permanent grassland
- Management of the lowland peat bog at the north end of Castle Lake to encourage restoration of bog plant specialists
- There is currently no control of water flows in Castle Lake. To create ideal habitat throughout the year, to explore if it is possible to manage water levels using sluices
- Some re-routing of pathways (not public rights of way) and existing sign boarding to minimise human disturbance to the lake, and enhance viewing opportunities and visitor information, for example to create better access to the bird hide with hard surfaced track to improve accessibility
- The construction of second bird observation or screened hide, opposite the existing hide on the other side of the lake, for better observation and recording of bird species, improved site accessibility and to offer possible educational opportunities to school children
- Groundwork to lower and enlarge existing Lake islands to enhance feeding and breeding opportunities for birds. Further excavation work to create new scrapes and re-profile existing lake scrapes and shore to create improved bird feeding areas
- Further planting of reed species along selected areas of the lake edge to increase available breeding and shelter habitat for water birds and aquatic plant species. Any new planted areas to be fenced to protect against livestock grazing



- Restoration of the deer park wall, which in some places is in a ruinous state, would perhaps lessen human disturbance of the site, improve livestock grazing control, and, given the ruinous condition of the current structure, remove a possible health and safety issue
- Some 'gapping up' of existing hedge lines to improve existing habitat and better flight lines for bird species, as well as invertebrates
- The creation of a sand martin bank and a swift tower to encourage a breeding colony as large numbers of birds already visit the site
- The seeding of a wild bird crop as strips within several of the current pasture fields to support winter farmland birds



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Electronic Resources:

- <https://www.bto.org/about-birds/birdfacts>
- <http://bishopmiddlehambirding.blogspot.co.uk/>
- <https://www.google.co.uk/maps/>
- <http://www.wildlifetrusts.org/wildlife/habitats/lowland-raised-bog>



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