

Kemerton Conservation Trust

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Kemerton Lake Nature Reserve Grassland and Reedbeds Restoration Project Report 19th December 2020

Project Background

Kemerton Lake Nature Reserve (KLNR) is Kemerton Conservation Trust's flagship reserve. It is a 46.5 acre (18.8 ha) wetland complex created out of a former gravel working, situated between the villages of Bredon, Westmancote, Kemerton and Kinsham. The reserve is a designated Local Wildlife Site, and has a diverse range of habitats including a 16 acre (6.5 ha) lake, pools, seasonal wet scrapes, reed beds, grassland, and land specially cultivated for arable plants. The reserve is surrounded by 111 acres (45 ha) of native woodland and arboretum which are not part of the reserve, but which make an important contribution to the habitat mosaic.

KCT manages the reserve under a long lease and the majority of habitat management on site is carried out by the Trust's volunteer Warden John Threadingham, and the Trust's volunteer work party group, with contractors brought in for specific tasks as needed and when funds allow.

Two key habitats at the reserve are the reedbeds which grow on the margins of the lake and in the pools including the Lagoon and Settlement Ponds (see Appendix A – Map of KLNR), and the limestone grassland around the Settlement Ponds and the lake. Both these habitats support a wide range of wildlife; the reedbeds provide nesting habitat for birds including Reed Bunting, Reed Warbler and Sedge Warbler, and roosts for large starling murmurations in autumn and winter, while the limestone grassland has many wildflowers which provide food and shelter for butterflies including the nationally scarce Dingy Skipper, moths and other invertebrates. County rarity Clustered Bellflower grows near the Settlement Ponds.

One of the biggest habitat management challenges on the site is staying on top of the spread of scrub including bramble, and self-seeded saplings such as Willow and Alder. Without intervention the site would transform in a few years, with scrub and trees drying out the reedbeds and covering the limestone grassland, resulting in fewer habitats and a loss of biodiversity. It is therefore vital that scrub clearance, including sapling removal, is carried out regularly, and as such it forms a key element of our site management. Much of the work is carried out by our warden, with occasional targeted work parties to clear larger areas. However, despite our best efforts, some areas of the reserve had become too scrubbed up in recent years, resulting in a significant loss of limestone grassland area, and the reedbeds around the Settlement Ponds and Lagoon were full of saplings and small

trees, degrading the habitat. Action was urgently needed to restore these wonderful habitats.

The Trust therefore applied to the England European Regional Development Fund through the Natural Networks programme delivered in partnership between Worcestershire County Council and Worcestershire Wildlife Trust for a grant to pay for a significant programme of scrub clearance, habitat restoration and habitat creation at KLNR to be carried out by contractors, supported by our warden and volunteers. We successfully bid for £2417.74, which represented 45% of the total project cost (the maximum the programme could fund). The project began in November 2019 and was completed in December 2020. The Trust also secured additional funding towards the balance of project costs from The Rowlands Trust in January 2020, including monies for a moth trap to carry out moth surveys onsite during the project.

Project Aims

The main aim of the project was to restore limestone grassland around the Settlement Ponds and reedbeds in the Settlement Ponds and the Lagoon through targeted scrub clearance and sapling removal. Also included was the removal of saplings along the southern bund of the main lake, to create a gap between the reedbeds and the woodland edge to assist with future management and removal of vegetation from four gravel islands on the main lake to improve them as nesting habitat for waders such as Oystercatcher. The project also aimed to create new habitat in the form of a new bee scrape and reptile hibernaculum near the Settlement Ponds and bird and bat boxes along the southern edge of the lake. Finally, two Black Poplar trees would be planted onsite, to boost the local population of this rare tree.

Overview of Works

Project works commenced in November 2019 as soon as our grant was awarded, and the final works were completed in November 2020. No scrub clearance was carried out during bird nesting season (April-August) to minimise disturbance to wildlife on site.

Phase one of the project saw contractors CRC Ecology clearing large stands of scrub and bramble from around the Settlement Ponds and the Lagoon, as well as cutting down saplings and small trees from the reedbed margins in the same area. They also erected bird and bat boxes and planted the Black Poplar trees, which came from the Trust's own nursery stock to ensure local provenance (see Appendix B – Photo Montage).

Our digger contractor Steve Underhill created the new bee scrape and dug out the hibernaculum.

In order to maximise contractor time, our work party volunteers supported the project works by clearing stacks of cut saplings and using them to build a dead hedge barrier along the woodland edge to the west of the Settlement Ponds, and by raking up flailed material from scrub removal to allow the grassland plants to reappear.

The weather conditions during phase one were extremely challenging, with high rainfall making ground conditions incredibly soggy. The risk of damaging the delicate limestone grassland was high, but our contractors worked very hard to minimise the damage and the works were completed on time and without any issues. The bee scrape and hibernaculum

were completely submerged in water for some time after they were dug, but thankfully the final weeks of March were hot and sunny, which dried up the water.

At the end of March the country went into lockdown as a result of the Covid-19 pandemic, so some changes to planned project events and work parties was necessary. Thankfully the lockdown rules did not materially affect the contractor works, as they were able to continue following minor adjustments to ensure Covid-19 safe working practices.

During bird nesting season the scrub clearance was on hold, but a moth trapping night was held in June, with moth experts Gavin Peplow and Oliver Wadsworth very generously donating their time and equipment to carry out a moth survey of the limestone grassland areas near the Settlement Ponds. Covid-19 rules meant the survey could not be open to the general public as originally planned, but three volunteers from KCT including Project Manager Kate Aubury assisted with the moth trapping, whilst following social distance guidelines.

Warden John Threadingham supported the project works by mowing areas where bramble was removed in phase one to prevent the regrowth from sprouting too fast.

Project Manager Kate also led a member-only project walk in August designed to highlight the works to date whilst also looking at some of the wonderful wildlife benefitting from the habitat restoration and creation. Covid-19 rules meant only a handful of attendees were allowed, which forced a change from a planned event for the general public to a limited spaces member-only event. During the walk attendees were able to see wildflowers blooming in some of the areas cleared of scrub and saplings during phase one.

Phase two of the project saw contractors brushcutting four gravel islands in the main lake, and using a boat to remove the vegetation to prevent biomass build-up. The aftermath was sprayed off to prevent regrowth. A large quantity of saplings was removed from the southern bund of the lake, creating a wide gap between the reedbeds and the woodland edge. In addition, further scrub clearance and sapling removal was carried out around the Settlement Ponds. A socially distanced work party in November supported the project works by removing cut saplings and adding them to the dead hedge barrier on the woodland edge.

Project Manager Kate also set up a trail camera overlooking the newly created gap on the southern bund to capture any animal activity for a week after the sapling removal.

A planned check of bat boxes had to be postponed as the necessary proximity of volunteers was not compatible with social distancing rules.

Project Results

Our project was completed on time and on budget, and there have already been visible signs of improvement to the habitats the project targeted.

In late spring and summer 2020, wildflowers were recorded blooming in areas that had been cleared of thick scrub in winter 2019/20 (see Appendix B – Photo Montage), including Common Spotted orchids growing by the Lagoon after the removal of a large stand of bramble, and Purple Loosestrife growing near the Settlement Ponds where a large stand of willow and bramble was removed. Dingy Skipper was again recorded on an area by the Settlement Ponds where Alder and Willow saplings had been removed,

highlighting the importance of keeping that section of limestone grassland clear of scrub. The bee scrape had a small number of mining bees using it within weeks of it drying up, which was very encouraging, although in autumn 2020 the bee scrape again filled with water, which makes it unsuitable for long-term use. The project team is considering possible solutions to improve drainage to hopefully resolve the issue.

The newly cleared islands will hopefully prove even more suitable for nesting waders next spring. This year one pair of Oystercatcher bred on one of the islands, but the vegetation was thicker than it should be, so the removal of vegetation this autumn should assist with that. We will monitor the regrowth and spray off again in late February should it prove necessary.

The sapling removal around the Settlement Ponds has been extremely successful, clearing large quantities, many of which had been growing in-situ for several years. As part of this project the contractors trialled using a specialist tool to remove the saplings roots and all where possible, with those that could not be so removed being cut just above ground level and the cut stem poisoned to prevent regrowth. Some regrowth has been noted where poison was not 100% effective, but the overall biomass of alder and willow in the reedbeds has reduced significantly.

One aspect of the project, the moth trapping, was included in order to improve our understanding of the Lepidoptera that use the limestone grassland. The Trust has many years of butterfly and day-flying moth data, which has informed our management of the grassland, but we had almost no night-flying moth data. The trapping session was designed to begin the process of understanding what species use the habitat and, if any are particularly rare or rely on a specific habitat or plant, how we might better manage the area for their benefit. During the session 154 species were recorded in the traps, which was a fantastic result (see Appendix C – Moth Trapping Results). In addition to the moths, the session saw the traps filled with hundreds of thousands of Caddis Fly, presumably due to coinciding with an emergence event. The quantity seen was staggering, and given their importance to wetland food webs, was a great sign that the lake and pools are flourishing.

Following the creation of a gap between reedbeds and woodland on the southern bund, which will help our warden and volunteers carry out future sapling management in addition to preventing drying out of reedbeds along the lake margin, our trail camera picked up a Fox (on three separate occasions), a Badger, two Fallow Deer, a Muntjac and several pheasants taking advantage of the new 'highway' to move through the reserve.

The bird and bat boxes erected will hopefully increase the nesting and roosting habitat for birds and bats on the reserve, but we were unable to carry out checks to follow up on whether they were utilised this year due to Covid-19 rules.

The Future

Preparing a management plan for the site to demonstrate how the improvements would be maintained into the future was one of the application requirements for the Natural Network programme. Although the Trust had a schedule of management for KLNLR, which we have used for many years, the new management plan is more detailed and includes a three year rotational plan for scrub clearance and sapling removal, which has been designed to build on the project's success and maintain the newly restored habitat into the future. It is important to note that scrub is a very useful and necessary part of the tapestry of habitats

on the reserve, so we always want to ensure there is plenty of bramble and other scrub for the wildlife which relies on it, but we need to keep a balance. By opting for a three year rotational plan, there will always be stands of bramble, and scrubby areas around the edges of the grassland, lake and pools, but they will be kept under better control so as not to degrade the grassland or reedbeds. With the assistance of contractors, as well as our brilliant warden and work party volunteers, we are confident we can maintain the targeted habitats that this project has so successfully restored. Having trialled using specialist equipment to remove saplings root and all, and as the Trust is looking to decrease the use of herbicides on site, we have recently purchased tree poppers (as part of a separate grant-funded project) for our volunteers which will be used to remove newly seeded saplings now and in the future. As our work party numbers have expanded in recent years, the new tools will allow us to carry out much more sapling removal work in-house, allowing us to keep on top of the management.

Brushcutting the island vegetation is an annual task, normally carried out by our warden, and this will continue in the future to ensure the islands remain suitable for breeding Oystercatchers and other waders.

The clearance work along the southern bund of the lake is the first stage in a longer-term plan to remove all saplings from the bund, so further sapling remove will be carried out over the next few years. The clearance is both to create a gap between the reedbeds and woodland to prevent reedbed degradation and also to maintain the integrity of the bund by preventing tree root damage.

The Trust intends to carry out bat box checks in 2021 if rules allow, and add the new boxes to our existing bat box scheme in future years. The bat box checks are carried out by a licenced bat worker as required under wildlife law.

More moth trapping is planned next year at a later date in the year, as different species will be on the wing then.

Acknowledgements

Kemerton Conservation Trust would like to thank the England European Regional Development Fund through the Natural Networks programme delivered in partnership between Worcestershire County Council and Worcestershire Wildlife Trust for generously supporting this project and making it possible. We would also like to thank The Rowlands Trust for additional funding to support the project and to pay for the purchase of moth trapping equipment.

We would also like to thank all those who assisted in the delivery of the project, particularly our Warden John Threadingham and our hardworking work party volunteers. Finally, we would like to thank our contractors CRC Ecology for dealing professionally with both unprecedented wet weather conditions in winter 2019/20 and for completing all works on time despite the challenges of Covid-19 rules.

A detailed map of the Kemerton Lake area. The map shows Kemerton Lake in the center, with 'The Scrapes' to its north and 'Reed Pond' to its east. A brown rectangular area is located between 'The Scrapes' and 'Reed Pond'. To the west of the lake is 'Kemerton Wood'. The map is bounded by 'Cheltenham Road' (B4079) to the west, 'Kinsham Lane' to the south, and 'Lake Walk' to the east. Various paths and rides are marked: 'Long Ride', 'Bishop's Ride', 'South Ride', and 'Westmancote'. A 'Westmancote Nursery' is located to the north. 'Upstones Orchard' is to the west. A north arrow is in the bottom left corner. Several 'H' markers are placed along the boundaries of the lake and surrounding areas.

Appendix B - Natural Networks Project Photo Montage

All photos copyright Kate Aubury except where noted otherwise



Sub-project 1: view north showing Top Settlement Pond to left & public footpath to right, before works start, November 2019



Sub-project 1: view north during scrub clearance works, January 2020



Sub-project 1: view south showing Bottom Settlement Pond to right & public footpath to left, before works start, November 2019



Sub-project 1: view south during clearance works, January 2020



Sub-project 1: a work party volunteer raking up flailed material for removal, February 2020



Sub-project 1: the digger contractor creating the new bee scrape near Top Settlement Pond on ground cleared of scrub, February 2020



Sub-project 1: completed bee scrape under water following storms, March 2020



Sub-project 1: mining bee nests on new bee scrape, April 2020



Sub-project 1: view along woodland edge on western side of limestone grassland, before works start, November 2019



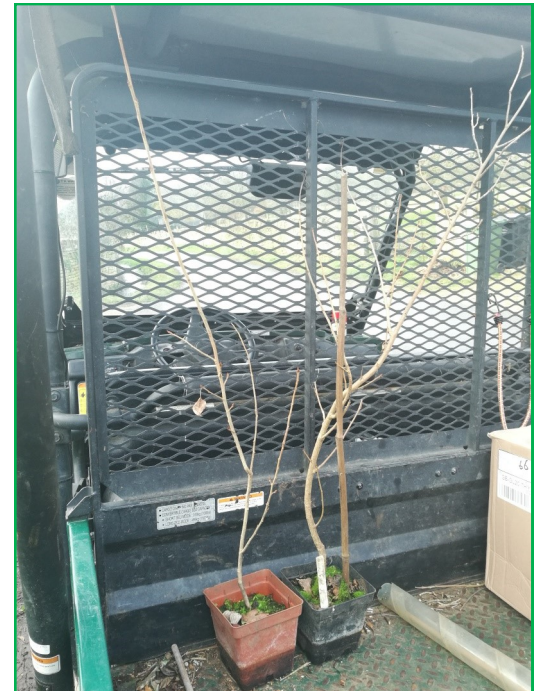
Sub-project 1: roboflail in action on woodland edge, January 2020 (*photo courtesy of CRC Ecology*)



Sub-project 1: view along woodland edge on western side of limestone grassland, after robo flailing, January 2020



Sub-project 1: completed Hibernaculum, May 2020



Sub-project 1: Black Poplar saplings ready to plant out, January 2020



Sub-project 1: Dingy Skipper on area cleared of bramble, in limestone grassland, April 2020



Sub-project 1: bramble clearance & sapling removal from Bottom Settlement Pond, October 2020



Sub-project 1: Project Manager Kate Aubury clearing saplings during a work party, November 2020 (© Tony Wood)



Sub-project 1: work party volunteer popping saplings around Middle Settlement Pond, November 2020



Swallow-tailed *Ourapteryx sambucaria* in moth trap, June 2020



Elephant Hawk-moth *Deilephila elpenor* & Small Elephant Hawk-moth *Deilephila porcellus* caught moth trapping, June 2020



Sub-project 2: tree marked ready for bird box, January 2020



Sub-project 2: bird box on oak tree near lake edge, April 2020



Sub-project 2: bat boxes on beech tree near lake edge, April 2020



Sub-project 2: three Oystercatchers on one of the islands, July 2020



Sub-project 2: two of the islands in Kemerton Lake before vegetation removal, September 2020



Sub-project 2: contractors brushcutting vegetation on one of the islands, October 2020



Sub-project 2: pile of vegetation removed from the islands and stacked by the lake edge, October 2020



Sub-project 2: one of the islands after vegetation removal, November 2020



Sub-project 2: sapling clearance along South Bund of Kemerton Lake, November 2020



Sub-project 2: brush barrier to prevent trespassing along South Bund of Kemerton Lake, November 2020



Still from trail camera of X on newly cleared southern bund, November 2020



Sub-project 3: view along eastern edge on Lagoon, before works start, November 2019



Sub-project 3: Close-up of sapling removal in reedbed of Lagoon, after scrub clearance, January 2020



Sub-project 3: Orchids flowering in a robo flailed section by the Lagoon, June 2020



Sub-project 3: View north showing stand of bramble at north-east point of Lagoon, before works start, November 2019



Sub-project 3: View south showing stand of bramble at north-east point of Lagoon, after roboclearing, February 2020



Sub-project 3: Lagoon view north showing robocleared area with regrowth, August 2020



Socially distanced Project Walk led by Project Manager Kate Aubury at Kemerton Lake, August 2020 (© Ian Aspey)

Appendix C - Moth Trapping Results

Kemerton Lake Moth Trapping Night: 26/06/20

Trappers: Kate Aubury (KCT), Gavin Peplow, Oliver Wadsworth

No. of Traps: 5

Conditions: Cloud cover 4/8, wind 3, temp. c.15 C at dusk

Duration of Trapping: c.21:45 to 02:40

Species Latin Name	Common Name
Abrostola tripartita	Spectacle
Acleris forsskaeana	
Acleris variegana	Garden Rose Tortrix
Acrobasis repandana	
Acronicta leporina	Miller
Agriphila straminella	
Agrotis clavis	Heart & Club
Agrotis exclamationis	Heart and Dart
Agrotis ipsilon	Dark Sword-grass
Alcis repandata	Mottled Beauty
Aleimma loeflingiana	
Anania coronata	
Anania lortulata	Small Magpie
Anaplectoides prasina	Green Arches
Apamea epomidion	Clouded Brindle
Apamea lithoxylaea	Light Arches
Apamea monoglypha	Dark Arches
Apamea scolopacina	Slender Brindle
Aphomia sociella	Bee Moth
Apterogenum ypsilon	Dingy Shears
Archips podana	Large Fruit-tree Tortrix
Archips xylosteana	Variegated Colden Tortrix
Argyresthia glaucinella	
Argyresthia goedartella	Bronze Alder Moth
Autographa gamma	Silver Y
Autographia pulchrina	Beautiful Golden Y
Axylia putris	Flame
Batia lunaris	
Bena bicolorana	Scarce Silver-lines
Biston betularia	Peppered Moth
Blastobasis lacticolella	
Brachylomia viminalis	Minor Shoulder-knot
Bryotropha affinis	
Cabera pusaria	Common White Wave
Callimorpha dominula	Scarlet Tiger
Caradrina morpheus	Mottled Rustic
Carcina quercana	Oak Longhorn
Cataclysta lemnata	Small China Mark
Catoptria pinella	
Celypha lacunana	
Chilo phragmitella	

Chilodes maritima
Chloroclystis truncata
Chloroclystis v-ata
Chrysoteuchia culmella
Coptotriche marginea
Cosmia trapezina
Crambis perlella
Crambus lathoniellus
Craniophora ligustri
Crocallis elinguaris
Cydia splendana
Deilephila elpenor
Deilephila porcellus
Ditula angustiorana
Ectropis crepuscularia
Eilema complana
Eilema depressa
Eilema lurideola
Epirrhoe alternata
Euchoeca nebulata
Eucosma cana
Eudonia lacustrata
Eudonia mercurella
Eudonia pallida
Eupithecia haworthiata
Eupithecia subfuscata
Euproctis similis
Euthrix potatoria
Euzophera pinguis
Geometra papilionaria
Habrosyne pyritoides
Hedya nubiferana
Hedya salicella
Hemithea aestivaria
Herminia grisealis
Herminia tarsipennalis
Homoeosoma sinuella
Hoplodrina alsines
Hoplodrina blanda
Hydriomena furcata
Hylaea fasciaria
Hypena proboscidalis
Hypsophygia costalis
Idaea aversata
Idaea biselata
Lacanobia oleracea
Laothoe populi
Laspeyria flexula
Lathronympha strigana
Leucania obsoleta

Silky Wainscot
Common Marbled Carpet
V-pug
Garden Grass Veneer

Dun-bar

Coronet
Scalloped Oak

Elephant Hawk-moth
Small Elephant Hawk-moth
Red Barred Tortrix
Engrailed
Scarce Footman
Buff Footman
Common Footman
Common Carpet
Dingy Shell

Marsh Grey
Haworth's Pug
Grey Pug
Yellow-tail
Drinker

Large Emerald
Buff Arches
Marbled Orchard Tortrix

Common Emerald
Small Fan-foot
Fan-foot

Uncertain
Rustic
July Highflyer
Barred Red
Snout
Gold Triangle
Riband Wave
Small Fan-footed Wave
Bright-line Brown-Eye
Poplar Hawk-moth
Beautiful Hook-tip

Obscure Wainscot

Lobesia abscisana	
Lomaspilis marginata	Clouded Border
Lomographa temerata	Clouded Silver
Lymantria monacha	Black Arches
Macaria liturata	Tawny-barred Angle
Melanchra persicariae	Dot Moth
Melanthia procellata	Pretty Chalk Carpet
<i>Mesapamea secalis agg.</i>	<i>Common Rustic agg.</i>
Mesoliguia literosa	Cloaked Minor
Miltochrista miniata	Rosy Footman
Myelois circumvoluta	Thistle Ermine
Mythimna conigera	Brown-line Bright-eye
Mythimna ferrago	Clay
Mythimna impura	Smoky Wainscot
Mythimna pallens	Common Wainscot
Mythimna straminea	Southern Wainscot
Noctua comes	Lesser Yellow Underwing
Noctua fimbriata	Broad-bordered Yellow Underwing
Noctua janthe	Lesser Broad-bordered Yellow Underwing
Noctua pronuba	Large Yellow Underwing
Notocelia uddmanniana	Bramble Shoot Moth
Notodonta ziczac	Pebble Prominent
Ochropacha duplaris	Common Lutestring
Ochropleura plecta	Flame Shoulder
Opisthograptis luteolata	Brimstone Moth
Ourapteryx sambucaria	Swallow-tailed Moth
Pammene fasciana	
Pandemis cerasana	Barred Fruit-tree Tortrix
Pandemis corylana	Chequered Fruit-tree Tortrix
Parapoynx stratiotata	Ringed China-mark
Patania ruralis	Mother of Pearl
Phalera bucephala	Buff-tip
Pheosia gnoma	Lesser Swallow Prominent
Pheosia tremula	Swallow Prominent
Philereme transversata ssp. Britannica	Dark Umber
Phycita roberella	
Plutella xylostella	Diamond-back Moth
Protodeltote pygarga	Marbled White Spot
Pterophorus pentadactyla	White Plume
Pyrausta aurata	Mint' Moth
Pyrausta purpuralis	Mint' Moth
Rhyacionia pinicolana	
Rivula sericealis	Straw Dot
Rusina ferruginea	Brown Rustic
Selenia dentaria	Early Thorn
Smerinthus ocellata	Eyed Hawk-moth
Subacronicta megacephala	Poplar Grey
Thera britannica	Spruce Carpet
Thumatha senex	Round-winged Muslin
Thyatira batis	Peach Blossom

Timandra comae	Blood-Vein
Tortrix viridana	Green Oak Tortrix
Udea olivalis	
Udea prunalis	a moth
Xanthorhoe quadrifasiata	Large Twin-spot Carpet
Xestia c-nigrum	Setaceous Hebrew Character
Xestia triangulum	Double Square-spot
Yponomeuta evonymella	Bird Cherry Ermine
Zeiraphera isertana	
Zeuzera pyrina	Leopard Moth
<i>Yponomeuta malinellus/cagnagella spp.</i>	
<i>Oligia strigilis agg.</i>	<i>Marbled Minor agg.</i>
<i>Acronicta tridens/psi</i>	<i>Dark Dagger / Grey Dagger</i>

No. Species 154

Unconfirmed Records

<i>Coleophora sp.</i>	
<i>Cosmorhoe ocellata</i>	<i>Purple Bar</i>
<i>Xestia rhomboidea</i>	<i>Triple Spotted Clay</i>