



CANVEY LAKE, CANVEY ISLAND MANAGEMENT PLAN

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Prepared by Essex Ecology

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The information, data, advice and opinions which have been prepared and provided are true, and have been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional *bona fide* opinions.

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1. INTRODUCTION

1.1 General Introduction

This Management Plan has been produced by Essex Ecology Ltd., the ecological consultancy of Essex Wildlife Trust, for Canvey Island Town Council. The plan provides advice on how Canvey Lake can be managed to enhance its value for wildlife whilst accommodating public access of the site. Recommendations for habitat creation and enhancement measures are provided. The plan was informed by site visits carried out on 18th February and 26th February 2024.

1.2 Location and Description of Site

Canvey Lake is within the central area of Canvey Island, Essex. It forms a green arc amidst the residential housing. The site stretches from Link Road in the west to Central Wall Road to the east and can be accessed by many small residential roads that are along it. The site is approximately 2 kilometres long and in its widest points 90 metres wide. The lake dominates the eastern side of the site while the west comprises amenity grassland and trees. The lake has reedbeds around it and on its islands. The site is approximately 3 metres above sea level. The site is approximately 15 hectares in size, with the lake consisting of 4.4 hectares of this.

The Ordnance Survey grid reference for the approximate centre of the site is TQ 79072 84123.

The site is owned by Castle Point Borough Council and is leased to Canvey Island Town Council.

A Public Right of Way (PRoW) runs along the northern side of the site (with cycleway), although there are permissive paths around the southern side as well. Paths also run north to south with four bridges over the culvert. There are 34 access points to and from the site and the surrounding housing. There is a small, free car park (off Denham Road), with a children's play area nearby.

The area is open for the public to enjoy. There are benches and litter bins. The site is a green corridor that people use to commute, relax and see wildlife.

1.3 Site History

The lake originated as a fleet (a small saltwater inlet/creek) and was once connected to the River Thames, Canvey Island itself being marshland that has been drained and turned into arable farmland. As such Canvey Lake is a manmade water body, the water input is non-natural. Over time the deepened fleet has become surrounded by residential housing. A more detailed history can be found in the feasibility study (see references).

1.4 Canvey Lake Designations LoWS and LNR

The lake is designated Canvey Lake Local Nature Reserve (LNR) (8.27 hectares). The LNR is designated for reedbed and marsh land (there is no further detail or information). Local Nature Reserves (LNRs) are a statutory designation made under Section 21 of the National Parks and Access to the Countryside Act 1949 by principal local authorities. They are for people and wildlife, giving people opportunity to learn about nature or simply to enjoy it.

Further to this, it has been mapped on DEFRA's MAGIC website as Priority Habitat and listed as reedbed. Priority Habitats are those which have been deemed to be of principal importance for the purpose of conserving biodiversity, being listed in the UK Biodiversity Action Plan. They are also referred to as Habitats of Principal Importance in England (HPIE).

This same area is a Local Wildlife Site (LoWS) (ref. CPT19), designated for the reedbed and open water. The LoWS citation mentions the specialists that are found there such as the Scarce Emerald Damselfly and Reed Warbler. The citation can be found in Appendix 2.

Map 1 shows the designated areas of the site.

1.5 Management Rationale

Management is arranged by Canvey Town Council and is undertaken by their ground maintenance team.

The Town Council aims to manage the site for the enhancement and benefit of wildlife and for people to enjoy. This includes allowing pedestrian access to the site and accommodating visitors' enjoyment without harming the site's ecological value.

MAIN AIMS:

- To improve the wildlife value of the site.
- To maintain and where possible enhance the populations of notable plant and animal species that are resident on the site.
- To address issues that are negatively impacting the site.
- Monitor and record the flora and fauna found on the site.
- Monitor the effects of management on the wildlife of the site.
- To encourage the safe public use of the site.

Proposed habitat management is outlined within this plan. Map 1 shows the site's designations and Map 2 shows the main habitat areas.

This plan has been written with the aim of improving the site for wildlife within the constraints of the site and management. Ideal management has been outlined in case funding becomes available, but then focuses on management within the current constraints of the site.

1.6 Constraints

There are multiple constraints to management of the site. The site is open at all times and has many access points, and because of this it has some anti-social behaviour issues (e.g. illegal motorbike use, graffiti, vandalism). There are limited resources, including funding, which means there is not the money for some of the more costly management options. Access also contributes to this, as there

are limited access points where it would be possible to get large machinery into the site or material off the site.

2. RECOMMENDATIONS

2.1 Lake

2.1.1 Habitat Description

The lake is brackish water, due to road water runoff which is freshwater (but may include road salt), and because there is groundwater movement with some sea water entering. The runoff from the roads means there is a lot of sediment and particulate material including heavy metals. It receives water from surface water drains and as such this water has pollutants from urban areas. The water leaves the lake by Hilton Dyke and goes into the creek.

Netting for invertebrates indicated that the water was brackish with a huge number of Common Shrimp (*Crangon crangon*). There were Water Boatmen, damselfly nymphs, Cased Caddisflies, Pond Snails, Bloodworms and Springtails. A Three-spined Stickleback was also netted. Water Boatman and Pond Snails can take oxygen from the surface and can survive in low oxygen water bodies. Bloodworms live in the sediment and can absorb oxygen at very low levels. Although there was a range of invertebrates, there needs to be more species that feed on algae to help reduce the algal blooms, and more of those which indicate good water quality and a healthy environment such as damselfly nymphs.

At present the depth of the water is approximately 20 centimetres with a deep layer of unconsolidated soft material (organic material and silt), leading to the 'bottom' of the lake at approximately 2 metres.

The main species of fish in the lake are Carp, Sticklebacks, Rudd, Roach, and Eels. Eels are a protected species (Critically Endangered on the global IUCN Red List of Threatened Species). Some Goldfish have been introduced and these have hybridised with the Carp, creating Brown Goldfish.

Fish have been permanently removed from the site under instruction by the Environment Agency in their thousands and this is continuing. This is due to welfare concerns for the large fish, during the summer when the oxygen levels

crash. Fish will also be feeding on the invertebrates, and fish mine the banks for nutrients, causing erosion of the islands and lake banks.

Birds seen during the survey included: Mallard, Herring Gull, Moorhen, Canada Goose, Greylag goose, Grey Heron, Mute Swan, Carrion Crow, Magpie, White Wagtail. The site has a breeding Reed Warbler population in the summer. Canada Geese are present in high numbers, especially in the summer. The waterfowl also contribute in high numbers to bank erosion and to the removal of the lakeside vegetation. Some species are poor digesters, meaning their droppings are high in nutrients, which negatively impact water quality.

Proposed Actions if Funding Becomes Available

Controlling Access

It would be good if the whole area could be fenced and the access to the site managed after dark. This would allow a lot more options for management for wildlife. At present this is not possible due to financial constraints, although, as stated, funding may become available in the future, and this should be considered. The lake area could then be open from dawn to dusk and closed after dark, allowing the wildlife to be undisturbed overnight.

Dredging

The ideal situation would be to dredge and reprofile the lake, taking away the material and creating a deep channel in the middle of the lake grading out to the sides and reprofile/stabilise the banks. If dredging with removal of silt is not possible, then dredging parts of the lake periodically to create deeper areas of water would be worthwhile, with a deep channel in the middle so there is a deeper refuge point for the fish that remain. At present there are budget constraints and access limitations, and dredging is not an option, although funding may become available in the future. The dredged material would be classified as hazardous/contaminated waste, due to the road runoff (heavy metals) and is expensive to remove off site. The fish and eels would need to be removed while the dredging was undertaken, then placed back after the works. The lake may

need to be drained in order to be dredged. Legal consent is required for dredging from the Environment Agency.

The lake has been previously dredged in 2019, and the material was used onsite to build up the islands. If the material cannot be removed this could be undertaken again, by deepening one area and making the lake smaller by using the material to extend the banks.

If particulates are not removed, it will become silted up, then become reedbed, and finally dry out and become covered in scrub. In other words, natural succession from one habitat to another would occur.

A deeper depth of water is useful for aquatic life to seek refuge, especially when the surface water freezes in winter. In summer the shallow water heats up rapidly and this leads to algal blooms. Deeper water would be beneficial for the control of algal blooms and better for the fish and eels.

The Current Situation

Trophic Levels in the Ecosystem and Eutrophication

At present there are important elements of a lake ecosystem that are missing. Usually there would be submerged aquatic plants at the base of the food chain; which grow using sunlight and the nutrients in the lake. These are likely absent because they have been eaten and now cannot re-establish because the water is too turbid (murky) to photosynthesise under the water. The only photosynthesising organisms present are free-floating in the water column adding to the cloudiness of the water. There needs to be zooplankton (very small herbivores) to eat this phytoplankton (microscopic photosynthesising primary producers). These small creatures need weed to hide in, otherwise they are predated. The (continuing) fish removal will help these recover by removing predation. As such the food chain is dominated by single celled algae which can quickly reproduce in response to nutrients and sunlight.

Increasing the amount of emergent and submerged plants will benefit the zooplankton and the invertebrates, giving them somewhere to hide from predation, sites for egg-laying, materials to build cases and sources of food. Many invertebrates graze on the algae on the surface of plants; this, as well as plant growth, will all help to remove nutrients from the water.

The water quality is poor, being hyper-eutrophic. The water comes from urban runoff and is high in heavy metals, particulates, and pollutants. This element cannot be altered, although some factors impacting water quality can be improved. The large numbers of waterfowl at the lake contribute to the poor water quality by their droppings. Feeding of the water birds also contributes through bread floating in the water and breaking down in the lake. The fish stir up sediment and 'mine' the banks.

Water entering the lake from the drainage system comes with suspended sediment and nutrients. In periods of sunny weather and low rainfall the water becomes hot, which allows the algae to reproduce, which uses the oxygen in the water leaving the fish without oxygen. A deeper depth of water would help alleviate this. Extreme weather caused by climate change is also a factor in this.

Succession will Continue

As stated, with the absence of dredging, the lake will inevitably be subject to succession. There is no natural way for sediment to exit the lake, the water will get shallower, and the marginal plants such as reed will spread across the water body. As this happens, the wildlife the pond supports will change. Willow scrub will take over and it will become scrub and woodland. Most management of natural habitats for wildlife is managing the process of succession to promote one stage over another.

Wildfowl and Water Quality

There are a high number of Canada Geese on and around the lake. These are being encouraged to stay due to public feeding. Natural England Technical Information Note (Natural England, 2011a) identifies many of the problems

associated with high numbers of urban Canada Geese, including overgrazing and trampling of amenity grassland. They also eat the aquatic vegetation. They are poor digesters, so their droppings are high in nutrients and, when entering the water body, increase nutrient levels. Over time they produce unsightly and unhygienic areas of mud and droppings beside the water body. People throwing bread into the water also makes water quality worse as uneaten food breaks down. The feeding of the birds should be discouraged through education. This is discussed further in section 2.6 and 2.8.

Restrictions on the Reinstatement of Fishing

Fishing in the lake will not be re-instated (licenced). At present there are 'anti-casting' posts and wires around the lake to stop people from fishing; these should be maintained until there is general acceptance that this not a fishing lake. There have been issues with fish health, with Koi Herpes Virus (a notifiable disease), and the lake has dangerous levels of Botulism (a bacterium) in the summer months. Botulism is naturally occurring but multiplies in warm water and can make humans sick if ingested. Fishing has been stopped due to these concerns over the fish health and welfare.

2.1.2 Management Prescriptions

Measures to Improve Water Quality

Preventing Algal Blooms

Algal blooms can be reduced using Barley straw. Decomposing straw releases chemicals that stops algae growing, without causing damage to other pond organisms. It takes about six to eight weeks to start to work in cold water (under 10°C) and just one to two weeks when the water is warm (above 20°C). The straw should be placed loosely in a sack (Christmas tree netting is ideal) with a float inside and anchored in the water so that it floats just at the surface. Surface area is important so these should be small netted 'sausages' which are placed at regular intervals around the lake edge. In order to keep algae at bay it would be best to put them in initially in February to April then change them again September to November. With a cross-over period to allow the new bags to start to work. The initial dosage rate required is approximately 500kilograms of straw

per hectare. This can be reduced in the subsequent year to 250kilograms per hectare. A maintenance dose of 100kilograms per hectare should go on each year. This should be undertaken regardless of whether or not there is an algal bloom, prevention being better than cure.

Algal blooms can be created by stirring up the nutrients on the bottom of the lake, either by waterfowl or by dogs entering the water (or by aerators), this should be avoided. (Waterfowl and aerators will be discussed further later.)

Dogs should be deterred from going into the water as this stirs up the sediment and nutrients, causing further algal blooms, and will disturb bird life. There is also a risk that dogs may become stuck in the deep silt and may also be poisoned by ingestion of cyanobacteria. This should be discouraged using signage.

Aquatic chalk to help the microbiology

The silt in the lake is composed of organic matter, sand and clay. Micro-organisms can break down the organic matter, but they die when the lake is eutrophic and too acidic. An application of aquatic chalk (Siltex or Superlon) is commonly used in fisheries to help restore the microbiology of lakes. It works by counteracting acidification. Applications should be undertaken only in the winter. Aquatic chalk can therefore help populations of micro-organisms recover and they can then get to work clarifying the water and reducing the spongy silt.

Using Trees and Shrubs to Shade the Water

Shading the lake with trees and shrubs will reduce algae production as it will reduce the sunlight entering the water and allowing photosynthesis. Trees and coppice stools (multi-stemmed shrubs) should be planted around the margins of the lake to grow up and give shade. These will need to be watered until established.

A few Alder, Hazel and Dogwood could be planted along the banks; although these can take time to grow, they will help cast some shade on the water. They can also be coppiced in later years to stop them getting too big. It should be

noted that Willow trees should not be planted within 40 metres of housing. It might be worth planting these as very young whips, as this way they will hardly be noticed and will not attract attention for vandalism.

Leaves that enter the lake in autumn should be removed whilst they are floating (before they sink) to reduce silt accumulation. Springbok rakes are effective for doing this (used upside down).

Aerators and Removing Fish

As described above, problems with low oxygen levels and gasping fish occur when there are prolonged periods of dry sunny weather. Although fish have been removed, not all could be caught, and more will need to be removed. Further to this, there are eels in the lake that are protected by law. Aerators may be needed to increase oxygen levels in the summer and autumn months. The choice of aerator is a difficult one because, at present, the lake is not deep enough to use some types of aerator in. A Venturi design aerator can be used to move the water horizontally rather than vertically or an area will need to be deepened to allow for aerator types that require a depth of water. A Venturi aerator releases the aerated water at a low pressure and does not stir the water up. You can make the Venturi unit quite easily; the Environment Agency has a tutorial here:

[How to make a fishery aeration Venturi unit - YouTube](https://www.youtube.com/watch?v=IZyrL5Ojqpo)

<https://www.youtube.com/watch?v=IZyrL5Ojqpo>

Plant in Front of Reinforced Banks

Planting up the banks will soften the hard line of the reinforced banks as well as giving framed views of the open water and interesting structure in the landscape.

In an ideal world the plants introduced to the lake should be of local provenance, meaning from a wetland less than 10 kilometres from the area. The landowner would need to be asked for permission and care would need to be taken not to introduce anything undesirable with them such as non-native invasives.

Aquatic plants can be added at any time of the year. Do not allow them to dry out when transporting and try to plant them at the same water depth as they were found. Plant 4-5 plants per metre edge.

Submerged plants may take longer to establish due to water being saline and turbid. It might be that this fails and needs to be tried again when the water is clearer.

The plants suggested in the following sections have been chosen based on being native and some for being tolerant of the salt water. The plants already present at the lake show a range of salt tolerance, some being freshwater plants and other being salt water. The Ellenberg indicator for salt tolerance has been used to suggest the planting.

Introduce Submerged Plants that Reach the Surface

Water Lilies (White Water-lily *Nympha alba* is a zero and Yellow Water-lily *Nympha lutea* is a 1 for salinity, slightly salt tolerant), could be introduced as their leaves cover the surface of the water reducing sunlight entering the water body. In this respect they should be able to live in the current turbid water and can help shade the water to reduce the algal blooms by reducing light in the water column. The water lilies can be planted in biodegradable plant nursery bags which can be weighed down with stones, with holes cut in the bag to allow the lily roots to infiltrate the lakebed.

Plant in Front of Bank Areas (those that do not need reinstating)

Plants can remove nutrients and they would also stabilise the banks. The banks that do not need reinstating should be planted with emergent aquatics, just in front within the water. These should be protected with chicken wire from grazing wildfowl until they are well established. Plants such as Yellow Flag *Iris pseudacorus* (salt tolerance 1+) and Purple-loosestrife *Lythrum salicaria* (salt tolerance 0, freshwater) can be tried. Sea Club-rush *Bolboschoenus maritimus* is robust but could prove invasive (salt tolerance 4+). Pre-seeded coir rolls can be used which are made of coconut fibre. Reeds can also be used from onsite,

which would prove inexpensive. (Note that Reedmace would be invasive and should not be introduced.)

Because of the shallow nature of the water and the high nutrient status, these introductions may be very successful and in time this vegetation may need managing by cutting and removal. The plants will be good at removing nutrients from the water.



Example of vegetation protected with wire nets at Waddon Ponds, Croydon

Introduce Submerged Aquatic Vegetation

The food chain in the lake has some levels out of balance due to the presence of fish (historically) and large numbers of wildfowl and a lack of submerged aquatic plants. There should be a balanced ecosystem with plants providing food for herbivores which in turn provide food for carnivores. Aquatic plants are needed for invertebrates such as water fleas (*Daphnia*) to hide in and these eat algae. At the moment, water quality appears to be poor and nutrient rich (hyper-eutrophic), and possibly acidic due to high organic material.

Hopefully in time when the water quality improves it will be possible to introduce submerged aquatic plants. These need to be initially protected with wire cages to stop them from being eaten. This should be done once the water is clear

enough that the light can reach the plants, otherwise if the water is still turbid, they will not be able to photosynthesise. The best locations would be marginal areas where the water is settled, away from the concentrations of wildfowl. Suitable plants for brackish water include Horned Pondweed *Zannichellia palustris*, Fennel Pondweed *Stuckenia pectinatus* and Soft Hornwort *Carex otrubae*. Fennel Pondweed can proliferate but can be raked out and removed, this being preferable to algal blooms.

Reinstate Eroded Banks

There is in places excessive bank erosion, with the soil going into the lake. This is due to the Carp mining the banks for nutrients and the waterfowl. These banks need stabilising and could be reinstated in their original position. At present the profile of the banks is a gentle slope into the lake, it would be useful when reinstating banks to make a raised lip to the water's edge. This would mean that bird droppings would not wash into the lake when it rains but be retained on the grassland.

Sheet piling and concrete (hard engineering) are effective but create an edge inhospitable to wildlife. Where this has already been undertaken on the lake it has proved effective. The areas in front of these could be planted up with aquatic plants to soften the edge visually and create habitat for wildlife. If this was continued in other sections, material could be dredged from the lake to put infill the banks. The soil could be seeded or turfed but would require fencing off from access until established.

A soft engineering approach could be used to stabilise the banks and stop erosion where the bank does not need to be reinstated. A range of methods would ensure that there are natural banks in places for wildlife to get in and out of the water. Timber faggots and coir rolls could be used to vegetate the banks, and this would create a more natural edge. Faggots are bundles of brushwood, these can be covered with soil and planted up. Faggots and coir rolls are biodegradable and designed to leave established vegetation to protect the bank, although the wooden stakes may need removal in future as they last longer.

Aquatic plant species to plant onto the faggots or coir rolls can include Common Reed from on site, bur-reeds (*Sparganium emersum* or *Sparganium erectum* (both 0+)), pond sedges (*Carex riparia* or *Carex acutiformis* (both 0)), Celery-leaved Buttercup (*Ranunculus sceleratus* (2)). Sea Aster *Aster tripolium* is already on site (Ellenberg 5) and could be increased. Saltmarsh Rush, *Juncus gerardii* could be used on the edges of the banks (3+). Again, these will need protecting from grazing until established, maybe with an arch of chicken wire or a metal cage. Reed will grow tall whereas shorter plants will still allow views across the lake for site users. These rooted plants are best introduced in winter-spring while they are still dormant.

The salinity of the water needs to inform planting. Salinity probably varies with inputs of water and evaporation changing. Therefore, the plants used need to have varying degrees of salinity tolerance. It might be a case of trial and error.

Increasing the reed margins would provide important nesting areas for water birds including Coot, Moorhen and Mallard.



Example of bank restoration and marginal plants protected with netting (before and after establishment)

Re-Grade Some Bank Area to Slopes

A few sections of the lake bank need to remain gently graded to the water so that birds can easily walk out of the lake. Sections near to Hilton Dyke are needed for the eels to cross over land and enter the dyke to reach the sea.

Litter Removal

Litter should continue to be regularly removed, especially at the pumping station where there is a concentration in the reeds.

2.2 Islands and Reedbeds

2.2.1 Habitat description

The lake has many islands covered with Common Reed, some with Bramble scrub and Buddleia. They have also been undercut by fish digging for nutrients. The islands are used by roosting birds and, over the summer, attract reedbed specialists like the Reed Warbler.

2.2.1 Management prescriptions

Reed Cutting

Reed cutting is undertaken twice a year around the accessible edges of the lake to give views of the lake, and this should continue. It would be beneficial to cut and remove the reeds from the islands periodically as well. This would hold back succession (the change that naturally occurs in the vegetation if unmanaged). Some islands are scrubbing over with Bramble and Buddleia colonising. The Buddleia should be removed.

A diversity of structure and age of reed is useful for wildlife, giving a range of micro-habitats. The reed on a fifth of the islands should be cut each year, in rotation, with the cut material removed. Some Bramble should be kept as this will attract birds like Cetti's Warbler and Sedge Warbler. Reed should be cut on rotation over winter, avoiding the bird nesting season. The majority (80%) of the islands each year will remain uncut, which will be beneficial for the Reed Warblers which are known to use the site.

Using Dredged Material to Extend the Reed Islands

The islands could be extended. A woven wooden fence could be lined with brash and back filled with dredged material. This would increase the area of reedbed,

repair the banks of the island where they have been undercut by fish action and deepen the water.

2.3 Grassland around the Lake

2.3.1 Habitat description

The grassland around the lake has been grazed by wildfowl and eroded by their droppings. In places there is extensive bare soil.

2.3.1 Management prescriptions

Reseeding Bare Ground

Some of the areas around the lake are bare due to wildfowl grazing and the effects of their droppings. Areas should be fenced to prevent access (trampling) and reseeded. Small sections should be seeded at a time. The fencing should be 8 centimetres off the ground to allow small birds to get underneath.

In the compacted area the soil will need to be prepared to receive seeds. The bare soil will need to be loosened to a depth of 10 centimetres and then raked to achieve a fine tilth. The seeds will need to be sown and then trod and watered. There is no need to cover them with soil. Protect the area initially with horticultural fleece (to stop the seeds being eaten) and water the area regularly. Allow the seeds to grow up and flower in the spring and summer. The area should be cordoned off and could include interpretation to inform site users of the purpose of the grassland restoration.

A diverse seed mix is recommended to ensure a long flowering season with flowers of different shape and size. This will maximise the suitability of the site for a variety of different pollinator and other invertebrate species. (It is possible to companion plant with annual wildflowers, so they provide colour until the perennials are established.)

Plant species suitable for an Essex wildflower meadow on neutral soils are:

Common Name	Scientific Name
Agrimony	<i>Agrimonia eupatoria</i>
Betony	<i>Betonica officinalis</i>
Chalk Knapweed	<i>Centaurea nigra</i>
Greater Knapweed	<i>Centaurea scabiosa</i>
Lady's Bedstraw	<i>Galium verum</i>
Field Scabious	<i>Knautia arvensis</i>
Oxeye Daisy	<i>Leucanthemum vulgare</i>
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>
Ragged-Robin	<i>Lychnis flos-cuculi</i>
Self-heal	<i>Prunella vulgaris</i>
Red Campion	<i>Silene dioica</i>
Devil's-bit Scabious	<i>Succisa pratensis</i>
Red Clover	<i>Trifolium pratense</i>
Tufted Vetch	<i>Vicia cracca</i>

In areas where the banks still have some vegetation, they should be overseeded with a wetland mix. This involves seeding on top of the vegetation to recover the bare areas. In the past the bankside vegetation has been notable (plants like Sea Clover have been recorded here) so some of these historic plants may survive.

The area closest to the water, once established, could be left to grow longer. This would allow the grass to help reduce the flow of wildfowl droppings into the lake too. The higher vegetation can become a home to grassland communities of invertebrates.

2.4 Amenity Grassland and Trees

2.4.1 Habitat description

To the west of the lake there are extensive areas of amenity grassland planted with standard trees, which are still quite young. There are coarse grasses such as Perennial Ryegrass and some flowering plants such as Dandelion, Clover and Cut-leaved Crane's-bill.

If the lake was fenced, there would be more options for management, such as establishment of shrub areas for nesting birds. At present, with the anti-social behaviour after dark, there is a concern that this could allow more negative behaviour by screening, so for present the area will be managed as an open space with good visibility.

2.4.2 Management prescriptions

Delay Cutting, Remove Arisings

Regular cutting from springtime through the whole of the grass growing season reduces annual wildflowers over time, as they do not have the opportunity to flower and set seed, so over time they disappear. Having said this, cutting is still essential, later in the year, to keep grasses that spread vegetatively from outcompeting herb plants through creating a thatch. This also stops the establishment of scrub. Most wildflowers take 6 to 8 weeks to flower and set seed, so ideally a length of time without cutting would benefit wildflowers and their associated wildlife. Delaying cutting until the end of August would allow wildflowers to complete their lifecycle.

For all of the site, grass cuttings should be collected during mowing, either by using equipment that can 'cut and collect' or by being raked up, and either removed from the site or deposited in a part of the site reserved for this purpose. If this is not done, the cuttings cover the bare earth, which is needed for annual plant seeds to germinate. Light availability at ground level is important for plant establishment.

Introducing Flowering Plants

Native spring plants which can benefit pollinators early in the season and then can be mown for visibility. These can be bulbs or plug plants, possibly of English Primrose, Cowslip, Wild Cyclamen, or Star of Bethlehem. Although this is more of a horticultural than conservation approach, these plants will benefit wildlife.

Bulb planting and plug planting could be undertaken with school children to get them invested in the site and therefore attached to it, which it is hoped may increase a local sense of ownership in the future.

Trees

A decision will need to be made whether to replace failed tree planting (due to vandalism) or not. The trees are being watered regularly, using irrigation bags. These will release water continually and should help establishment. Watering needs to be increased in the summer months.

Once the trees are established and resistant to wind rock (sturdy) the stakes and rubber ties can be removed before they start to restrict growth.

2.5 Protected and Rare Species

European Eel

The European Eel is listed as Critically Endangered on the global IUCN Red List of Threatened Species. Eels undertake huge migrations across the ocean, from where they are born in the Sargasso Sea to UK rivers. In the rivers they turn from juveniles to sub-adults before returning to where they were born to breed. They can cover short distances on land. Conservation measures are trying to remove barriers to their migration. The eels in the lake could be monitored, how they get into and out of the lake could be investigated. Then measures could be taken to help their passage between the lake and the sea by installing eel passes.

Scarce Emerald Damselfly

The LoWS citation states that the nationally scarce Scarce Emerald Damselfly is present at the site. The measures to improve water quality and promote emergent aquatic vegetation will help this species and removal of the fish will reduce predation. A survey could be conducted to assess its population levels (it can be seen on the wing during July and August).

If the lake is left to silt up and turn into dry habitat the habitat for these species will disappear.

Water Voles

The lake perimeter was surveyed for Water Vole in 2014 and no signs of them were found. There were signs of Brown Rat. It is possible that Water Voles have colonised in the intervening 10 years or may have been present in low numbers on the islands that were not surveyed in 2014. Bank and island construction works should be preceded by a survey for Water Vole prior to commencement.

Reed Warbler

The Reed Warbler is a summer visitor, arriving from mid-April with autumn migration back to Africa. It breeds here in reedbeds where it weaves a nest between two or three reed stems and lays three to five eggs. It prefers uncut reeds, these being thicker and more established, allowing the birds to nest earlier. The thicker reeds also mean less predation and leads to on average more broods being raised each year.

2.6 Non-native Species

Terrapins

There are Terrapins in the lake. These should be caught, if possible, and rehomed at a suitable animal sanctuary like Raystede (08125 840252 or info@raystede.org). Alternatively, the National Centre for Reptile Welfare in Tonbridge can help further with rehoming (07824386248 or info@ncrw.org.uk). Not only can terrapins negatively affect the lake, mainly by eating the aquatic plants, but there is an animal welfare issue with these animals being left out in the colder UK environment. They often suffer ill-health as they cannot digest food when they are cold which in the UK is the most part of the year.

Canada Geese

The Canada Goose is not a native species, being introduced in 1665. Their population in the UK is still increasing and their impact on water bodies is well documented. Because they are tame by nature they are often fed by humans. This should be discouraged because it stops their normal behaviour of moving

between foraging and roosting sites and encourages them to remain at one site, so concentrating their impacts.

2.7 Site Infrastructure, Paths and Bridges

The site has benches and seating areas (west end of the lake) for people to stop and enjoy the lakeside views. Rubbish and dog waste bins are located at entry points. Some are corroding and could be renewed. There are concrete areas that could be used for further seating and planters, with planters planted with bee-friendly horticultural flowers. The car park surface will periodically need maintaining. The jetty is regularly cleaned to remove bird droppings, and will need to be regularly checked for structural integrity.

2.8 Interpretation

People should be encouraged to use the site. Their enjoyment of the wildlife will enhance wellbeing and foster a sense of connection with, and care for the site.

The most effective way of influencing visitor behaviour is through education, and this can be achieved through interpretation that tells visitors why the site is important for wildlife. There are interpretation boards around the lake which include information on the site's wildlife (see photographs in Appendix 1), but these are now weathered and could be updated to increase the public's understanding of the wildlife using the site. There is a notice board and some signage regarding the prohibition of fishing.

Interpretation is a way of informally engaging with the visitor to give them a message about the site they are visiting. In a nature area this would usually be about why the site is valuable for wildlife, but it could include the cultural history of the area too. Usually, the title of the board has the main message within it, so if the visitor only reads one line, they get the message. Then there are 2-3 sub-themes, consisting of paragraphs supporting the main theme. Then there are images, with facts underneath (connected to the text/theme). The fourth level is usually what the visitor can do themselves to help or engage further. This can be to volunteer or take action in their own garden to support wildlife.

Replacement boards will need to be designed to be vandalism-proof, robust and easily cleaned.

Feeding the ducks and the geese is something that people do in their childhood and then do with their children in turn. Feeding the birds on the site is an easy way to interact with wildlife and connect to it. However, there are problems with feeding waterfowl as this can adversely affect water quality, causing eutrophication, as described above.

Therefore, feeding the birds should be discouraged. This can be done by informing the public of the impact feeding has on wildfowl, giving alternative ideas of what to feed wildfowl (if you want it to continue), or messaging discouraging feeding.



Example of public information educating the public on what to feed birds from
Hylands Country Park

We LOVE people
but not their food!



Bin the Bread and let us fly!

Regularly feeding our watery Wandle birds causes

**Unnatural Behaviour. Water Pollution. Over Crowding.
Delayed Migration. Poor Nutrition. Disease**

Public information discouraging public feeding from Wandle Valley



Signage displayed to discourage feeding in Wandsworth

The Canal and Rivers Trust launched a campaign in 2015 to educate the public about the effects of feeding wildfowl. Details can be found at <https://canalrivertrust.org.uk/news-and-views/features/help-us-keep-our-ducks-healthy>

2.9 Canada Geese Monitoring

Hopefully the measures suggested will help restore the bankside vegetation and improve the water quality. The numbers of Canada Geese and their effects should be monitored. It may be that they are able to eat the vegetation as fast as it is trying to be established. Canada Geese are long-lived, and an adult population may persist at a site for some time. It may be that a suite of management strategies are needed to control the birds and improve the quality of the lake. Exclusion by fencing on the islands may be needed and visual scarers (e.g. flutter tape) may have some impact. However, such measures may be controversial and would need to be undertaken with interpretation explaining the reasons for, and the benefits of reducing the geese population. Such measures should not be undertaken during June/July when the birds moult and are flightless.

A count during the moult season would give reliable year on year population data. If the population is increasing further measures to control this may be necessary.

Observation should be made of their behaviour outside of the flightless season, are they exhibiting natural behaviour: moving offsite to feed around Canvey Island and returning to roost, or are they staying at the lake permanently.

2.10 Biological Monitoring and Recording

Ecological surveys can be used to obtain baseline data on what species are using the site, and then to see if their populations are increasing. Regular breeding bird surveys would be beneficial, along with invertebrate surveys. This knowledge can then be used to inform the future management of the site and its habitats.

The choice of species to monitor is likely to depend on the availability of voluntary wildlife recorders, unless funding is available to commission commercial surveys. Those species most readily surveyed are likely to include breeding birds and certain invertebrates, such as butterflies, moths and bees. Records should be submitted to Essex Field Club, who keep biological records for the county.

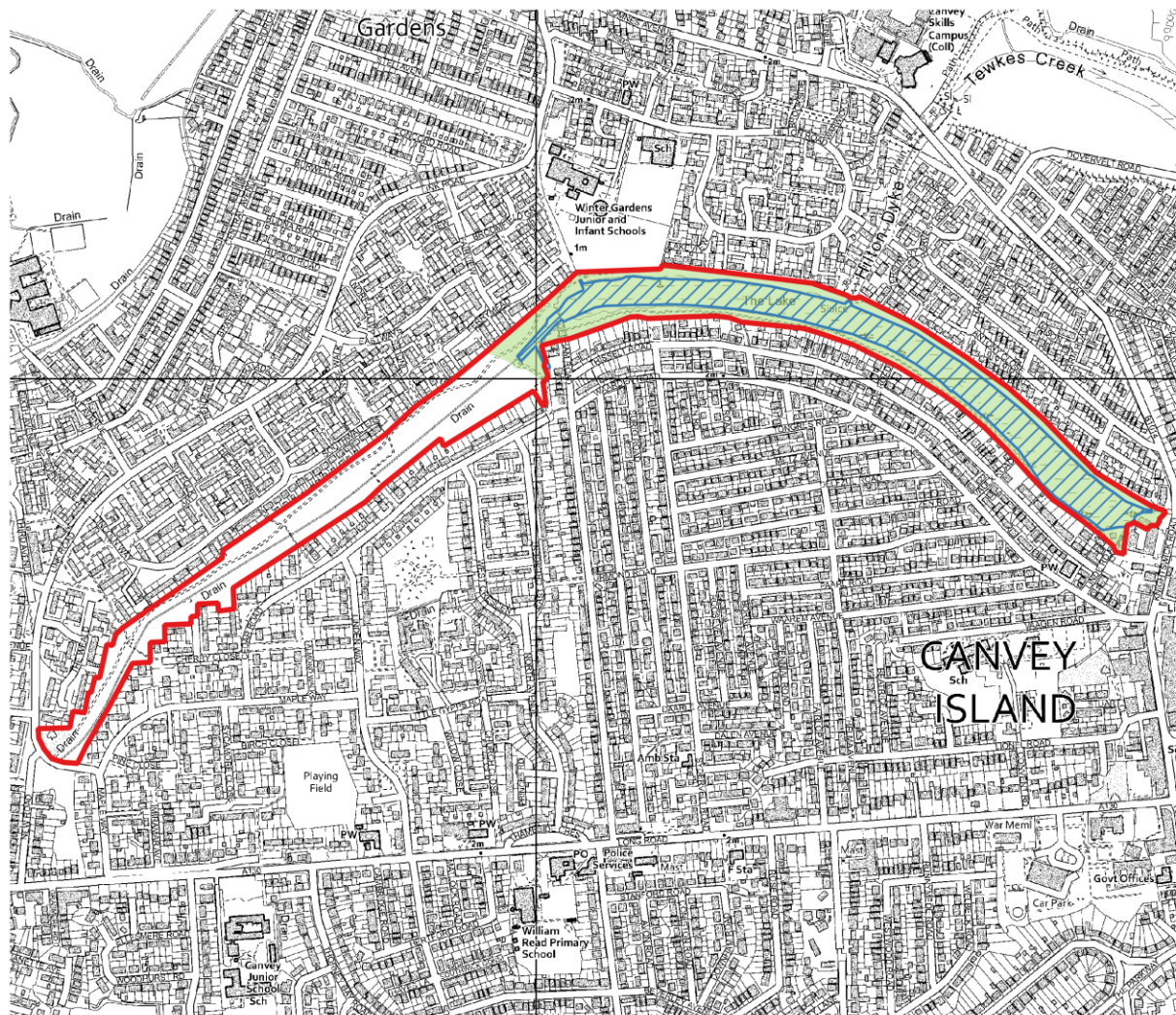
It is probable that the reedbeds support breeding migrant birds and unusual invertebrate assemblages.

3. MANAGEMENT PRESCRIPTION TABLES BY MONTH AND YEAR

Management	January	February	March	April	May	June	July	August	September	October	November	December
The Lake												
Barley straw to discourage algal growth		✓	✓	✓					✓	✓	✓	
Application of aquatic chalk to help microbiology	✓											✓
Planted trees and coppice stools (Alder, Hazel, Dogwood) to shade water	✓	✓									✓	✓
Plant emergent aquatic plants in front of the reinforced banks, protect from grazing with chicken wire	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Plant emergent aquatic plants in front of the banks that do not need reinstating (uneroded) protect from grazing with chicken wire	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Introduce water lilies protected with wire cages	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Introduce fully submerged aquatic plants protected with wire cages		Once the water is clear enough that the light can reach the plants										

Management	January	February	March	April	May	June	July	August	September	October	November	December
Litter pick in the lake and reeds	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
The Banks Reinstate Eroded Banks		When funding allows										
Planted up new banks with aquatic plants protect from grazing		When funding allows										
Islands and Reedbeds Reed cutting, a fifth of the islands each year, remove arisings (outside of bird nesting season)	✓									✓	✓	✓
Remove Buddleia	✓									✓	✓	✓
Grassland around the lake Reseeding bare ground, fence off		✓	✓									
Overseed where some vegetation persists fence off		✓	✓							✓	✓	
Amenity grassland and trees Allow wildflowers to set seed, even if in some areas, remove cuttings			✓					✓				

Management	January	February	March	April	May	June	July	August	September	October	November	December
Plant native spring plants		✓	✓									
Replace failed tree planting	✓	✓									✓	✓
Interpretation Renew interpretation		When funding allows										
Bird Surveys Canada Goose population count						✓	✓					
Biological Monitoring Keep species records	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Site infrastructure Maintain site paths, jetty, bridges and car park		When required.										



Map 1 Canvey Lake, Site Boundary and Designations

- ▬ Canvey Lake Site Boundary
- ▨ Local Wildlife Site
- Canvey Lake LNR

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Map 2 Broad Habitats at Canvey Lake

Habitats discussed in the plan

- Lake
- Reed islands
- Grass banks of the lake
- Amenity grass and trees

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website accessed 16.02.24

Natural England Local Nature Reserves (England) <https://naturalengland-defra.opendata.arcgis.com/datasets/Defra::local-nature-reserves-england/about> accessed 14.05.24

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Wild Essex Canvey Lake <https://www.wildessex.net/sites/Canvey%20Lake.htm> website accessed 16.02.24

Appendix 1. Photographs



Trees at the west end of Canvey Lake, the Link Road entrance



Water inlet at the west end of Canvey Lake, the Link Road entrance



Site infrastructure – bins



Close up of the amenity grassland



Looking towards the end of Cherry Close



New tree planting and example of vandalism



View from the bridge of the central section of the site (Cedar Road to Lincoln Way)



Play area



Environment Agency pumping station that moves water from the drains into the lake



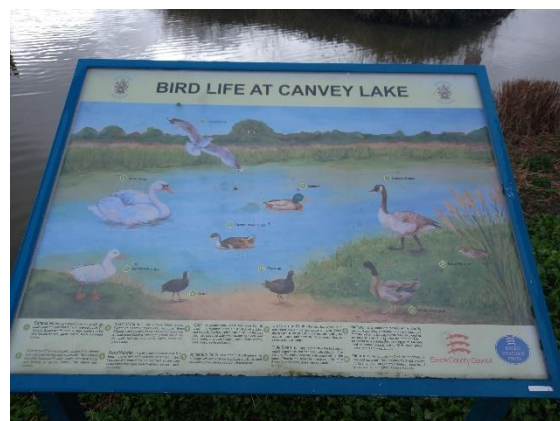
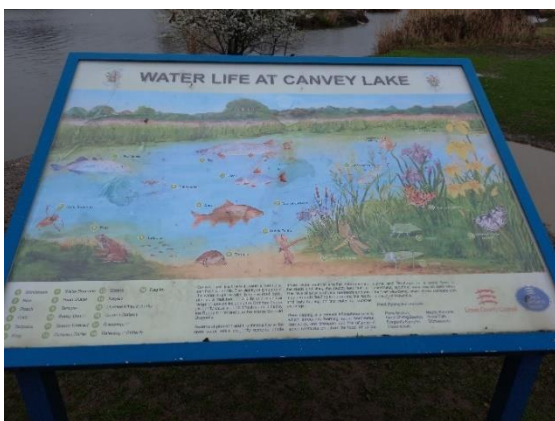
Soil erosion areas where there is heavy trampling



West end of the lake from bridge by Denham Road



Bank erosion on the southern side of the lake



Interpretation at the lake



Car Park at the end of Denham Road



Southern side of the lake showing the islands within it



Grey Heron fishing



Anti-casting measures to stop fishing



Entrance from east end, Knightswick Road



The northern side of the lake from the lake path



Water leaving the lake to Tewkes Creek

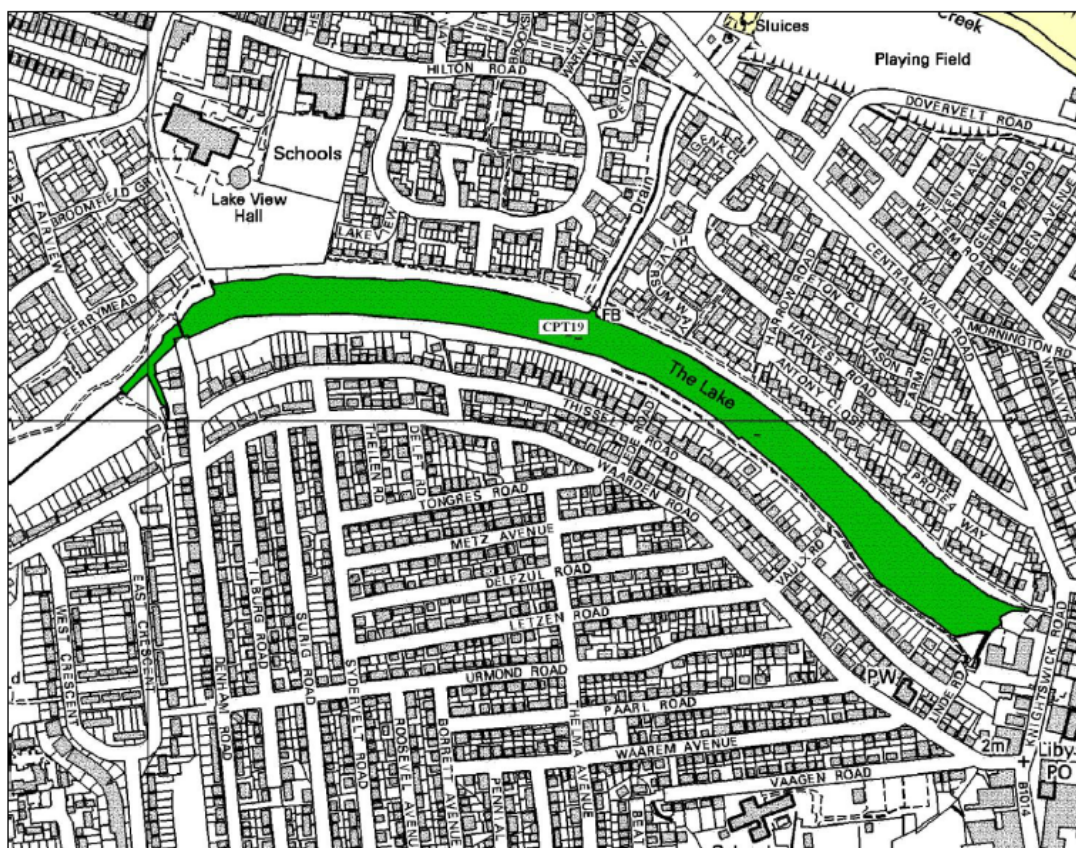


Jetty



Island with reed and scrub colonising

Appendix 2. The Lake, Canvey LoWS Citation



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CPT19 The Lake, Canvey (4.5ha) TQ795840

This site supports the largest pure stand of Common Reed (*Phragmites australis*) in the borough and is also the largest body of open water in Castle Point. In addition to the reed, emergent vegetation includes Sea Club-rush (*Bolboschoenus maritimus*) and Great Willowherb (*Epilobium hirsutum*). Marginal flora reflects the brackish nature of the lake and its origin as a grazing marsh fleet, with Sea Aster (*Aster tripolium*), Common Saltmarsh-grass (*Puccinellia maritima*), Saltmarsh Rush (*Juncus gerardii*), Wild Celery (*Apium graveolens*), Sea Beet (*Beta maritima*), Meadow Barley (*Hordeum secalinum*) and small quantities of the Nationally Scarce Sea Clover (*Trifolium squamosum*). Within the reedbeds are a series of grassy islands supporting Bramble (*Rubus fruticosus* agg.), Elder (*Sambucus nigra*) and Blackthorn (*Prunus spinosa*).

The lake supports a good population of Reed Warbler and is used by a variety of other waterfowl including Grey Heron, Coot and Mute Swan. The nationally rare, but spreading, Scarce Emerald Damselfly (*Lestes dryas*) is present and it is likely that a good assemblage of reed specialist and aquatic invertebrates is present, but no surveys have been done.

England BAP Priority Habitats

Reedbed

Selection Criteria

HC15 Reedbeds

Rationale

The Site is dominated by this England BAP Priority Habitat.

Condition Statement

The site remains in reasonable condition, although natural succession will lead to inevitable decline.

Management Issues

The site receives extensive use in the form of fishing, feeding the ducks and general public access and amenity, with consequent problems of litter, disturbance and trampling. Silt removal on a cyclical basis would have a beneficial effect on the reed community, but would be practically difficult and costly.

Review Schedule

Site Selected: 2002 (CP19)

Reviewed: 2007 (CP19), 2012 (CPT19)

Appendix 3. Sources of Wildflower Seed

Taken from Plantlife website:

<https://meadows.plantlife.org.uk/making-meadows/sowing-seed/buying-wild-flower-seed/>

Accessed 11/04/23

UK Suppliers of wildflower seed, plug plants, and wildflower turf in the East of England.

Barenbrug UK, 33 Perkins Road, Rougham Industrial Estate Bury St Edmunds, Suffolk, IP30 9ND

British Wild Flower Plants, Linda Laxton, MD, Main Road, North Burlingham, Norfolk, NR13 4TA, 01603 716615, office@wildflowers.co.uk

Emorsgate Seeds, Donald McIntyre and Richard Brown, Limes Farm, Tilney All Saints, King's Lynn, Norfolk, PE34 4RT, 01553 829028, enquiries@emorsgateseeds.com

Growing Wild Ltd, The Dutch Barn, Sibsey Road, Boston, Lincolnshire, PE21 9QR, 01205 359 935, 07901 535 354, info@wildaboutseeds.co.uk

Kings, Sandy Lane, Diss, Norfolk, IP22 4HY, 0800 587 9797, kingscrops@frontierag.co.uk

Wild Flower Shop, Elm House, Green Street, Hoxne, Suffolk, 07590 895590, enquiries@wildflowershop.co.uk