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CREATING FLOODPLAIN WETLAND FEATURES

7.2 Floodplain wetland mosaic

RIVER THAMES

LOCATION - Pinkhill Meadow, Farmoor Reservoir, Oxfordshire SP 439067

DATE OF CONSTRUCTION - JUNE 1990, December 1991

AREA - 1.5ha

COST - £112,000

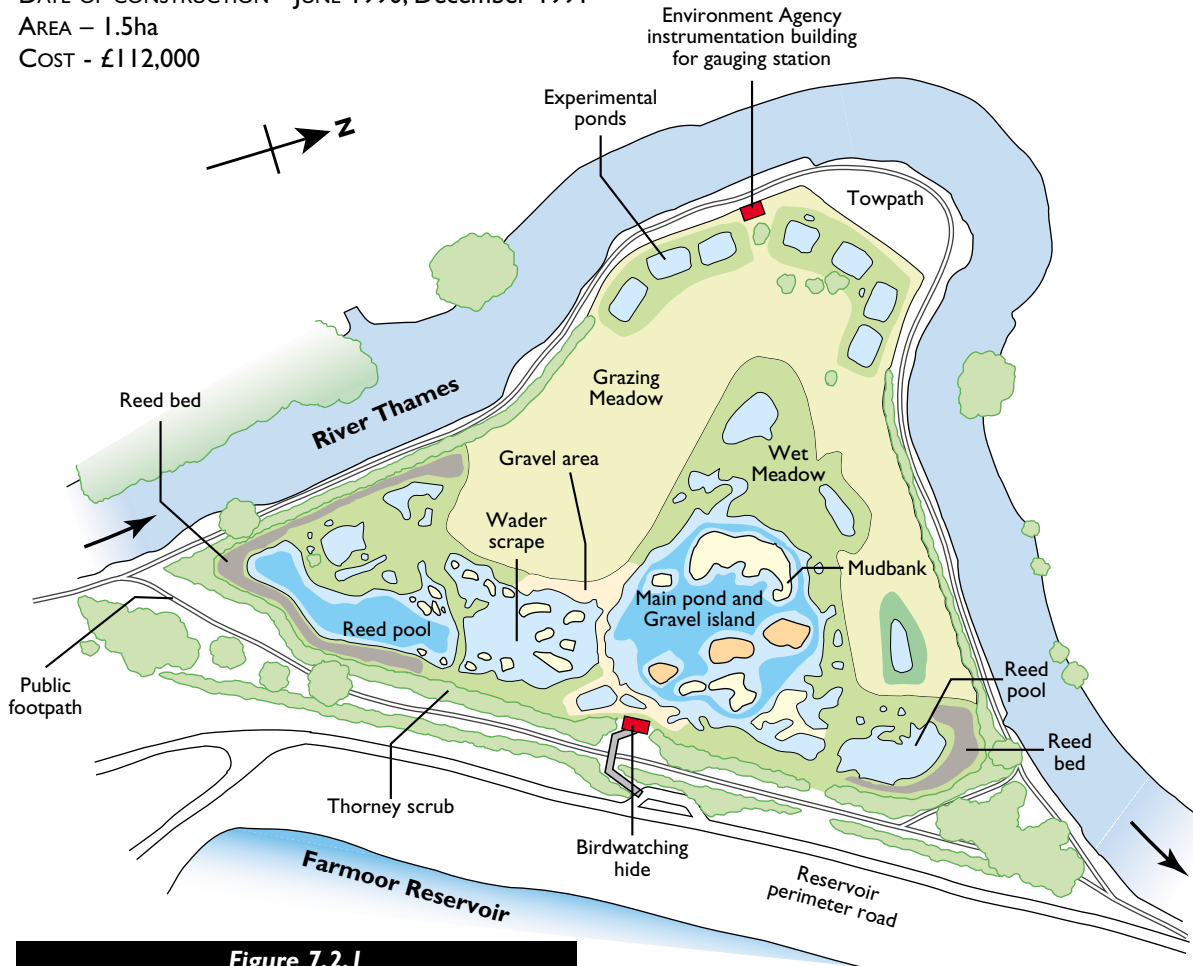


Figure 7.2.1
PLAN OF PINKHILL MEADOW

DESCRIPTION

Pinkhill Meadow is located in a 4 hectare meander of the River Thames at Farmoor Reservoir. In a detailed landscape assessment of the reservoir site in 1988 the meadow was identified for its potential for wetland creation. Few areas of wetland had survived agricultural improvement in this part of the Upper Thames Valley. Approx. 1.5 hectares of the meadow still had a valuable relic meadow flora including species such as Adders Tongue, Great Burnett and Pepper-saxifrage.

The aim of the scheme was to compliment the river and the reservoir habitats by restoring the floodplain wetland within the meadow which had been largely disturbed during reservoir construction. A key objective was to restore habitat for breeding

waders and wildfowl, notably Redshank, and to create a place where people could experience a wide variety of wetland wildlife at close quarters and enjoy a more “natural” floodplain landscape.

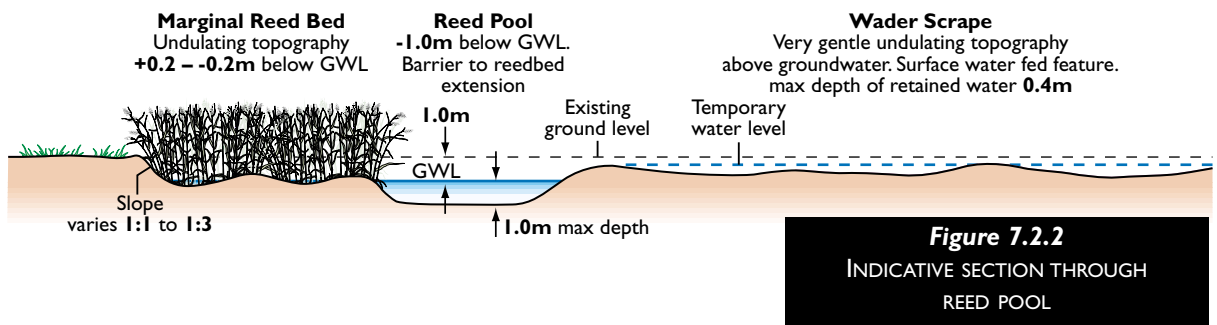
The project was a collaboration between the landowners (Thames Water) and the National Rivers Authority, advised by Pond Action. Large parts of the Farmoor wetland complex are open to members of public, and keys to the birdwatching hides can be obtained from the Wardens Lodge at Gate 3.

DESIGN

A concept plan for the site was prepared from the landscape appraisal and developed into the detailed design, incorporating the project objectives with the site constraints.

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The mosaic of over 40 ponds and pools was designed to maximise the topographical, hydrological, biological and visual diversity of the site. This included specific creation of individual waterbodies with a wide range of maximum depths and permeability, and low angle, undulating drawdown zone areas to encourage both wetland plant diversity and wading bird habitat.

Two phases of excavation were undertaken, the first in June and July 1990 and the second over the winter period in 1991/2. By phasing the works it was possible to better understand the detail needed for the more complex works in the second phase.

Excavation was based on detailed landscape design drawings provided by the NRA landscape architect, and firmly led by close project management and continuous on-site supervision from key members of the project team. In this way the inexperienced machine operator was able to achieve the very subtle variations in topography in relation to water levels. The 20,000m³ of excavated material was carefully graded into a low hill near the adjacent Pinkhill Lock, but outside of the floodplain. This was then planted with trees and shrubs and sown with a wildflower seed mix.

In phase 1 four waterbodies were created; the main pond, wader scrape and two reedbed pools. In phase 2 the existing waterbodies were extended, added to

and re-profiled to create areas of shallow water, wet meadow, mudflat and temporary pool habitat.

Observations of the phase 1 works provided valuable detail for the improvements undertaken in phase 2. Observations of actual as opposed to design water-levels in the pools were used to refine the new excavation levels, marginal areas and undulating contours of the wet meadow. The location of the mudflats was also based on the usage of the various areas of the site by different target wader species.

Key features created:

Deep water

The main pond is up to 2.5m deep and covers an area of just under 0.5ha and was excavated down into the gravel aquifer. The size and depth increases the diversity of habitats and isolates the several islands reducing the likelihood of predation of bird nests. The depth also ensures open water and from a management viewpoint it also restricts the complete colonisation by marginal wetland plants.

Shallow-water areas and edges

These areas were designed to be between 300mm below and 100mm above normal water levels. As the main pond level will fluctuate by about 300mm, reflecting groundwater levels, these areas are important to retain shallow slopes at the water's edge.



Wader scrapes
(February 1992)





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Main pond, pool and reedbed creation (February 1992)

Temporary ponds and pools

The site also includes small temporary pools, some isolated and some bordering the larger waterbodies. Sizes vary from a few square meters to the larger two semi-permanent ponds (approx. 100m²). These transient ponds are designed to dry out in drought years (two or three times since excavation) and provide a habitat with low fish predation, benefiting many aquatic invertebrates and some amphibians.

Wader scrape

A 400mm maximum depth shallow pool was formed within the alluvium overlaying the gravel aquifer and the water level controlled by means of a connecting pipe to the main pond. This feature provides extensive muddy margins for feeding waders and Teal, particularly during autumn migration.

Gravel islands and margins

Created over an area of 0.1ha, these provide nesting habitat for Little Ringed Plover and Common Tern. The gravel was carefully selected from a local source to ensure a good size distribution, important for

these species. Selectively placed cobbles and boulders also provide surface variation.

Mudflats and islands

These were created by excavating into the alluvium. Gentle slopes of 1:20 min. provide bare feeding and nesting habitats for wading wildfowl, but also created a more open habitat suitable for some marginal wetland plants.

Undulating wet grassland

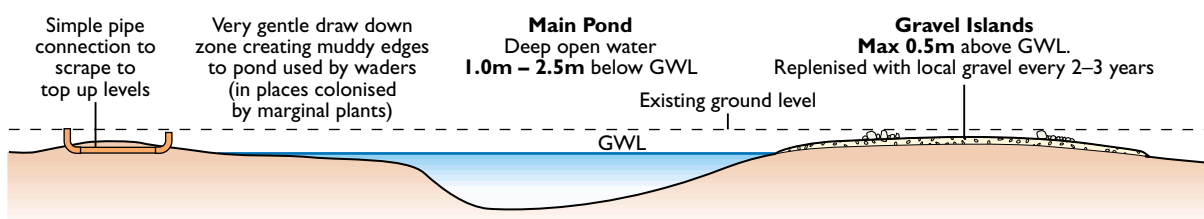
Small variations in topography were engineered to create an undulating meadow with water levels close to the surface (between 100 and 200mm above normal water level). This marshy/tussocky Rush and Sedge dominated area was designed to provide feeding and nesting areas for waders, particularly Redshank and Snipe.

Reedbeds

Two linear reedbeds, totalling over 250m in length, were excavated along the eastern edge of the site. Shallow trenches were dug and planted with pot

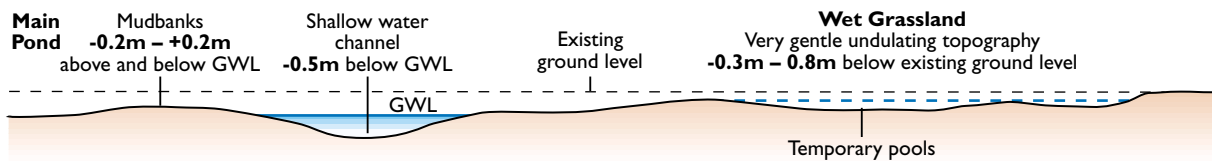
Figure 7.2.3

INDICATIVE SECTION THROUGH MAIN POND AND GRAVEL ISLANDS



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Figure 7.2.4
INDICATIVE SECTION THROUGH WET GRASSLAND



grown Common Reed. These serve as a boundary to human disturbance from adjacent footpaths and provide valuable nesting and foraging habitat for wetland birds such as Reed Warbler and Water Rail.

Scrub

A double row of mixed shrubby Willow (incorporating some Hawthorn, Blackthorn and Dog Rose) forms a 4m wide hedge at the eastern edge of the site linking adjacent areas of reed, meadow, hedges and woodland. As with the reedbed the presence of the hedge also helps to mitigate the disturbance of the nearby footpath, as well as sustaining a rich insect population and providing over-wintering cover for frogs, toads and newts. The scrubby character is to be retained by staggered coppicing on an annual basis ensuring a permanent screen is maintained.

SUBSEQUENT PERFORMANCE 1999 – SPRING 2001

Continuous post-project appraisal was carried out on this site for the first 5 years after construction and the results showed that this small wetland creation scheme quickly acquired an extremely rich wildlife community.

In these 5 years over 20% (over 60 species) of all Britain's wetland and aquatic plant species colonised the site. In the main pond alone the plant community was one of the richest recorded in ponds in the county. Similarly 22% (over 150 species) of Britain's macroinvertebrate species were recorded on the site, including 12 breeding species of dragonfly.

Breeding wader densities have been very high, in one year up to 100pairs/km² equalling that of grazing marsh and other important British wader habitats.



Aerial view of site

In 1993 and 1994 two pairs of Little Ringed Plover bred, representing 15% of Oxfordshire's breeding population. Unfortunately the site was too small to sustain such densities and the plovers have not returned since 2000.

As a result of the commitment of the partners and individuals involved, the continued appraisal of the site's development some minor and major modifications have been funded in every second or third year between 1992 and 2002.

These have included:

- managing gravel islands;
- scraping new mudflats;
- creating new pools;
- doubling the size of the main reedbed;
- annual coppicing and thinning of the willow scrub.

A key reason for the success of Pinkhill is the combination of critical factors for creating biologically high quality sites:

- good water quality;
- high degree of landscape connectivity to other wetlands;
- complex mosaic design integrated sensitively into the floodplain; and specifically at Pinkhill;
- wetland creation with people in mind;
- combining 6 Key River Thames habitats in one place;

Similar design principles as those used to create Pinkhill Meadow have subsequently been adapted to create two further wetlands at the site, known as Shrike Meadow and Buckthorn Meadow.

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