Water Treatment Works

Title
Water Treatment Works 2001-2002

Description and Summary of Results
Historically, wastewater treatment works, previously often known as sewage farms, provided some of the most valuable artificial habitats for birds throughout the year in Britain and abroad, and many of the pioneer studies on inland wader migration were made at such sites. The shallow lagoon systems often supported high densities of several wader species, eg Ringed Plover *Charadrius hiaticula* and Redshank *Tringa totanus*, and the irrigation plots, effluent lagoons and sludge beds, with shallow water or bare mud, provided good feeding sites for several other waders and passerines. Sites with grass meadows were important sites for wintering waders such as Lapwing *Vanellus vanellus* and Snipe *Gallinago gallinago* as well as species like Black-headed Gull *Chroicocephalus ridibundus*, Fieldfare *Turdus pilaris*, Redwing *T. iliacus* and Starling *Sturnus vulgaris*. In the 1950s and 1960s most sites supported a range of breeding birds associated with wet or damp habitats, eg Moorhen *Gallinula chloropus*, Pied Wagtail *Motacilla alba* and Reed Bunting *Emberiza schoeniclus*, and many supported breeding Mallard *Anas platyrhynchos*, Sedge Warbler *Acrocephalus schoenobaenus* and Yellow Wagtail *Motacilla flava*.
Modern wastewater treatment in Britain, and therefore the sites, have changed markedly though. The field lagoon rotation system was a huge area by comparison with most contemporary sites and size was undoubtedly one of the key factors in their ornithological value. A variety of systems now operate, most of them very unlike the sewage farms of the past in terms of the habitats available for birds, with the biggest change being the reduction in the extent of wetland habitat. Nevertheless, there are still opportunities for birds on modern sites, especially where there is habitat (or habitat that can be created) that is otherwise scarce in the surrounding landscape. Even small areas of semi-natural or marginal habitat, such as waste ground, scrub and hedgerows, can provide valuable feeding and nesting sites for a range of species. Man-made features, eg percolating filters and tertiary treatment, especially surface irrigation can be important, and pump-houses and buildings provide nest sites for hirundines, thrushes, wagtails, Starlings and House Sparrow *Passer domesticus*. But, despite the known value of urban habitats for birds, our knowledge about the nature of the bird communities of treatment sites and the factors determining their density and diversity remain poor.
The Water Treatment Works survey was designed to describe the bird communities at works in lowland eastern England through the seasons, and relate these both to the habitat characteristics of the sites themselves and to the nature of the habitat and bird community in the surrounding landscape.
A total of 35 sites was surveyed covering the whole Anglian Water region. Nineteen of these received all nine visits, 32 received all three winter visits and 19 received all six summer visits (ten sites received no summer visits).
Over the whole survey period, the total number of species on a site varied from nine species (Wymondham) to 81 species (Marston), with the main factors increasing numbers being site

size, habitat diversity and, perhaps surprisingly, the extent of urban habitat in the surrounding area. The numbers of most individual species tended to be most strongly associated either with damp habitats, often with areas of short grass, or woody habitats such as hedgerows (the most important feature) and scrub.
Pied Wagtail, Starling and Dunnock *Prunella modularis* were the most obvious species associated with sites compared to surrounding areas, and several others listed as 'Birds of Conservation Concern' were found more commonly on treatment sites than nearby.
Treatment works no longer provide extensive wetland habitats, but they do provide areas of rough grass, scrub and hedgerows that are becoming increasingly rare in the wider countryside. The value of the sites for birds can be maximised by enhancing habitat diversity, particularly where this includes areas of cut and uncut grass alongside woody habitats. Sites that still include large areas of wet or damp grassland or meadows or are particularly large merit specific management plans, but continued positive habitat management is likely to benefit many bird species, particularly those foraging, roosting or nesting within woody habitats.

Methods of Data Capture
Volunteer observers were able to choose any site from a complete list of over 1000 wastewater treatment works within the Anglian Water region. They were asked to visit their site three times in the winter and six times in the summer although the number of visits at most sites fell rather short of this ideal.
Observers were asked to walk to within 50m of every part of the site and, using a standard mapping technique, record all the birds encountered, either by sight or sound, on site maps. Birds flying over, such as gulls were not recorded unless they were actively using the air space for hunting. In a few cases, at the smaller sites observers were able to record birds accurately from the perimeter fence but at most access had to be arranged.
In addition, an initial visit, prior to the first bird survey, was made in late summer/autumn 2001 to map habitats. Observers were asked to record the presence of all habitats within and including the boundary of the works site. This included semi-natural habitats such as hedgerow, scrub and wet meadows, as well as the installations themselves, eg pump-houses and rotary filters.

Purpose of Data Capture
The primary aim was to assess the ornithological value of modern wastewater treatment works. More specifically: 1) to describe the bird community of treatment works in an area of lowland England in winter and summer; 2) to relate the bird communities to site characteristics including size, the nature and diversity of habitats present and the nature of the surrounding landscape; 3) to determine the extent to which the breeding bird community was similar to that in the surrounding countryside; and 4) to use this information as a basis for management recommendations.

Geographic Coverage
The region covered by Anglian Water, roughly in and to the east of Essex, Cambridgeshire, Northamptonshire, Leicestershire and Lincolnshire.

Temporal Coverage
Twelve months from the autumn of 2001.
Birds were recorded on nine survey visits, three in winter and six in summer. Winter visits were made between 1 October and 15 November 2001, 16 November and 31 December 2001 and 1 January and 28 February 2002, with a minimum of ten days between each visit. Summer visits were carried out monthly between 1 April and 30 September 2002. Summer visits were made before 11:00 hours and winter visits between 10:00 and 15:00 hours, to coincide with peak bird activity and, in winter, to avoid roosting movements in the morning and evening.

Other Interested parties
The project was funded by Anglian Water and with the full cooperation of their managers and staff on individual sites.

Organiser(s)
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Publications
The main report was produced as a BTO Research Report:
Gough, S., Gillings, S. & Vickery, J.A. 2003. The value and management of waste water treatment works for breeding and wintering birds in lowland eastern England. *BTO Research Report* no. 333.

Available from NBN?
No.

Computer data -- location
BTO Windows Network central area.

Computer data -- outline contents
The bird counts from each visit on each site divided into the habitat they were recorded in.

Computer data -- description of contents
1 spreadsheet contains the counts of each species in each habitat type on each visit to each survey site. 1 spreadsheet contains the habitat types available on each site.
Other files are letters, images, reports, instructions, lists of volunteers etc.

Information held in BTO Archives
1 Transfer Case holds all data and associated papers.

Notes on Access and Use

Other information needed

Notes on Survey Design

Specific Issues for Analysis