



Report No. SRL/WE/004.2

Otter, water vole, badger and bat activity and
distribution in the Lakes E and F area, near
Radley, Oxfordshire.

Additional information on mammals; a supplement to Ecology
Summary Report SRL/WE/001

by

R M G Eeles
B J B Crowley
and
J Cartmell

ECOLOGY SUMMARY REPORT (MAMMALS)

commissioned by
Save Radley Lakes

(updated)

April 2006



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Summary: Otters, water voles, badgers and bats occur in and around Lakes E and F, the lakes that RWE Npower has threatened (ENV/019/2005 and ENV/057/2006) to fill with Pulverised Fuel Ash (PFA). Otters occur in the vicinity of the lakes and, since 2000, have been seen, or field signs have been found, with increasing frequency. Otters appear to have recently re-established themselves in the locality (or are remaining for longer, rather than being sporadic and transient residents as in the recent past), after an effective absence of many decades. They seem to have bred in the Radley Lakes environs in 2005. The last remaining lakes at Radley probably represent critically important resources for the long-term survival of female otters and cubs in the district, which are reliant upon, and spend typically between 80% and 90% of their time in, freshwater lakes and inter-connecting streams. Water voles are present in both lakes, currently in limited numbers, although indications from adjacent habitats are that numbers are rising significantly in the district, after years of national decline, and they are also likely to rise in Lakes E and F area. Badgers and their setts are present around these Lakes. These animals regularly forage around these waterbodies, especially since much of the surrounding landscape has been lost to PFA disposal. Few, if any, badgers would be likely to remain in the area if Lake E were to be infilled with PFA – there would be insufficient foraging habitat left for them. Bats are notably common around the lakes. The destruction of either or both of the lakes by infilling with PFA will have a devastating impact on bats, due to loss of both feeding and roosting sites. All of these species are legally protected, and as such any developments that may have an impact upon them cannot proceed without proper assessments and mitigation, if at all. Previous habitat losses of significant magnitude, in the locality, have increased the importance of the lakes, and their surrounding habitats, to wildlife.

April 2006

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OTTER, WATER VOLE, BADGER AND BAT ACTIVITY AND DISTRIBUTION IN THE LAKES E AND F AREA.

A summary report prepared by RMG Eeles BSc (hons) PhD, BJB Crowley MA D.Phil, and J Cartmell

SUMMARY

*Otters, water voles, badgers and bats occur in and around Lakes E and F, the lakes that RWE Npower has threatened (ENV/019/2005 and ENV/057/2006) to fill with Pulverised Fuel Ash (PFA). **Otters** occur in the vicinity of the lakes and, since 2000, have been seen, or field signs have been found, with increasing frequency. Otters appear to have recently re-established themselves in the locality (or are remaining for longer, rather than being sporadic and transient residents as in the recent past), after an effective absence of many decades. They seem to have bred in the Radley Lakes environs in 2005. The last remaining lakes at Radley probably represent critically important resources for the long-term survival of female otters and cubs in the district, which are reliant upon, and spend typically between 80% and 90% of their time in, freshwater lakes and inter-connecting streams. **Water voles** are present in both lakes, currently in limited numbers, although indications from adjacent habitats are that numbers are rising significantly in the district, after years of national decline, and they are also likely to rise in Lakes E and F area. **Badgers** and their setts are present around these Lakes. These animals regularly forage around these waterbodies, especially since much of the surrounding landscape has been lost to PFA disposal. Few, if any, badgers would be likely to remain in the area if Lake E were to be infilled with PFA – there would be insufficient foraging habitat left for them. **Bats** are notably common around the lakes. The destruction of either or both of the lakes by infilling with PFA will have a devastating impact on bats, due to loss of both feeding and roosting sites. All of these species are legally protected, and as such any developments that may have an impact upon them cannot proceed without proper assessments and mitigation, if at all. Previous habitat losses of significant magnitude, in the locality, have increased the importance of the lakes, and their surrounding habitats, to wildlife.*

INTRODUCTION

Due to the restricted nature of the ecological appraisal requested by RWE Npower, the July 2005 report from Bioscan (E1340R2, 2005)¹ provides little information about the presence or distribution of mammals in the vicinity of Lakes E and F, apart from a limited bat survey being carried out. No evidence for the presence of otters, badgers and water voles was obtained, for example. A report commissioned by Save Radley Lakes (SRL/WE/001)² gave information on the presence of these and other mammals, but provided little additional information on their distributions³ or population estimates, because much of the data were not available until later in the year. Without this information it has not been possible for wildlife organisations, such as BBOWT, to obtain a clear understanding of the importance of Lakes E and F to mammals. This report addresses some of the shortfalls in the preceding documents.

¹ Bioscan (UK) Ltd, (July 2005) *Radley Ash Disposal Site Lakes E and F Ecological Appraisal*, Bioscan Report No: E1340R2

² Eeles R.M.G., (2005, 2006) *Evaluation of the Wildlife and Habitats at Spinage's Field and Thrupp Close/The Bullfield*, Save Radley Lakes Report No: SRL/WE/001.

³ An oversight pointed out to the author by Matt Jackson of BBOWT.

A number of mammal species present in and around Lakes E and F, are listed in previous documents (see above). Some of them have protected status under wildlife legislation, such as the European Habitats Directive (EHD) 1992 and the Wildlife and Countryside Act (WCA) 1981. Amongst these are otters⁴, water voles,⁵ badgers⁶ and bats, at least four species of which inhabit the Lakes E and F area⁷.

A number of mammal species occur in and around Lakes E and F. In the prevailing absence of significant data on species, such as rodents and terrestrial insectivores (shrews) this report focuses on those species, for which data are available, which tend to be those that are covered by stricter legislation.

BATS

Bats enjoy legal protection under a number of Acts and Directives. These apply to all species found in Britain. The presence of bats should be sufficient to require a full ecological survey, as would normally be carried out under an *Environmental Impact Assessment*, addressing matters such as which species are present, distribution, population sizes and likely impact throughout the year, on the bats, of a proposed development, before any planning permission can be granted. This has been legally tested in the very significant 'Cornwall Case', **R v Cornwall CC ex parte Hardy**, (Appendix 1). The legal judgment in this test case applies to all species protected under, in this example, the Habitats Directive (1992), not just bats. A number of such protected species inhabit, or are dependant upon, the habitats in and around Lakes E and F.

Bat surveys, carried out on behalf of Save Radley Lakes (and additionally by Alison Riggs, Appendix 2) have provided additional distribution data to that given by Bioscan in E1340R2 (2005)¹ together with some limited information on abundances. Activity of bats and some idea of numbers are approximately assessed. It is extremely difficult to obtain accurate population estimates for such highly mobile and nocturnal species, even using a number of experienced bat detector operators equipped with torches. Surveys were confined to the Lakes E and F area. The northern part of Lake E has not yet been investigated using a bat detector. Bat activity beyond the immediate Lakes E and F area was not investigated. Surveys were undertaken in 2005 in July (2 nights⁸), August (1 night) and September (1 night) plus incidental observations between May and September 2005

⁴ The Otter, *Lutra lutra*, is listed on Appendix 1 of CITES, Appendix II of the Bern Convention and Annexes II and IV of the Habitats Directive (1992). It is protected under Schedule 5 of the Wildlife and Countryside Act 1981. The European sub-species is also listed as globally threatened on the IUCN/WCMC RDL. It is a UKBAP *Priority Species*.

⁵ The water vole, *Arvicola terrestris*, is currently protected by means of Section 9, part (4) of the Wildlife and Countryside Act (1981), which means that it is illegal to damage, destroy or obstruct access to any structure or place which it uses for shelter or protection, AND which also makes it an offence to disturb a water vole whilst using such a structure or place for that purpose. It is currently being considered for addition to Schedule 5. It is a UKBAP *Priority Species*.

⁶ The badger, *Meles meles*, is protected by the Wildlife and Countryside Act (1981) and the animal and its sett are protected by the Protection of Badgers Act 1992.

⁷ The Daubenton's bat, *Myotis daubentoni*, Pipistrelle bat, *Pipistrellus pipistrellus*, and Noctule bat, *Nyctalus noctula*, are listed in Appendix III of the Bern Convention, Annex IV of the Habitats Directive (1992) and Appendix II of the Bonn Convention (and are included under the Agreement on the Conservation of Bats in Europe EUROBATS). All bats are protected under Wildlife and Countryside Act 1981. These acts also apply, by inference, to the 'soprano' Pipistrelle, *Pipistrellus pygmaeus*, which has only recently been recognised as being resident in Britain. All species of bat are UKBAP *Priority Species*. All European bats are listed under Appendix II of the Convention on Migratory Species (CMS).

⁸ A 'night' in this context means from a little before dusk until around midnight, or earlier if activity shifted away from accessible parts of the site.

during other nocturnal survey activities. Precise timings of bat occurrences were not recorded.

Daubenton's bat

Daubenton's bats, *Myotis daubentoni*, were notably common over the whole of Lake F and the southern part of Lake E (Figure 1). They were very apparent at dusk flying with their characteristic 'shallow-amplitude' wing-beat close to the water surfaces. Identification was confirmed using a bat detector. Surveys were confined to these locations, and the northern part of Lake E was not surveyed. We estimated that, during July, abundance of this species over the southern part of Lake E, and the whole of Lake F, exceeded 100 and was perhaps in the order of 150. They are known to roost close to water⁹ and are, therefore, likely to be roosting in the trees surrounding lakes E and F. Maternity roosts are also likely to be located in nearby trees¹⁰.

Pipistrelle bats

Large numbers of Pipistrelle bats, *Pipistrellus pipistrellus*, and the 'soprano' Pipistrelle, *Pipistrellus pygmaeus*, were detected in all surveyed areas and numbered around 100. Many more are likely to be present across the whole site. These species were seen and acoustically detected after sunset over the water bodies (not indicated in Figure 1) and along all hedgerows and tree lines. There were notable numbers of (mostly) Pipistrelles on the southwest side of Lake F (numbering around 50) in the air during August, for example. The 'soprano' Pipistrelle is much more dependant upon lakeside habitats (for feeding) than is *Pipistrellus pipistrellus*¹¹ and, therefore, is ecologically more like the Daubenton's bat, in that it is more dependant than *Pipistrellus pipistrellus*, upon standing water bodies and emerging aquatic insects such as caddis flies. *Pipistrellus pygmaeus* also roosts in much larger colonies than *Pipistrellus pipistrellus*¹², so the effect of tree removal is likely to have a more severe impact on populations of the 'soprano' species, as more individuals are potentially roosting in each individual tree.

Noctule bat

Noctule bats were observed throughout the site at tree level, with no evidence of any focus or concentration of activity. Sightings were incidental to the overall bat surveys, or other surveys at dusk. This species was recognised mainly by its large size and characteristic flight behaviour (rapid flight above trees with frequent steep dives). It was infrequently picked up with a bat detector and echolocation may be confused with the serotine bat, *Eptesicus serotinus*. Numbers were in the 10's of individuals, but more are likely to be present in the area. They were seen, occasionally at tree top height or higher, on the west side of Lake F, and along the boundary between Lakes E and F. The authors know of no roosts, but they are considered most likely to be present in the larger trees along the eastern and northern sides of Lake E.

⁹ Barret-Hamilton G E H. (1910-11). *A History of British Mammals*. I. *Bats*. Gurney & Jackson, London.

¹⁰ Nyholm ES. (1965). The ecology of *Myotis mystacinus* (Leisl.) and *Myotis daubentoni*. *Annales Zoologici Fennici*, **2**: 77-123.

¹¹ Vaughan N, Jones G & Harris S. (1997). Habitat use by bats (Chiroptera) assessed by means of a broad-band acoustic method. *Journal of Applied Ecology*, **34**: 716-730.

¹² Barlow KE. (1997). The diets of two phonic types of the bat *Pipistrellus pipistrellus* in Britain. *Journal of Zoology (London)* **243**: 597-609; Barlow KE, Jones G & Barratt EM. (1997). Can skull morphology be used to predict ecological relationships between bat species? A test using two cryptic species of pipistrelle. *Proceedings of the Royal Society of London, Series B*. **264**: 1695-1700.

General comments on bats

In view of the numbers of bats apparent when weather conditions were ideal (still, warm nights) it is clear that sizeable populations of at least three, and possibly four, species are present around Lakes E and F. We would be surprised if there were not more species, such as the brown long-eared bat, *Plecotus auritus*, of which one of us (R Eeles) has, in the area, found corpses. The recent test case (the 'Cornwall Case', Appendix 1) clearly indicates that full ecological surveys are a legal requirement before the full impact of the proposed destruction of Lakes E and F, and surrounding trees, can be evaluated. Neither the bat work undertaken by Bioscan (E1340R2, 2005)¹ nor that carried out on behalf of Save Radley Lakes meets the criteria of a full ecological assessment and hence, a full survey by suitably trained and licensed specialists would be required. No roosts have been located (except in nearby houses) though their occurrence in the Lakes E and F area is highly probable.

BAT DISTRIBUTION AROUND LAKES E AND F

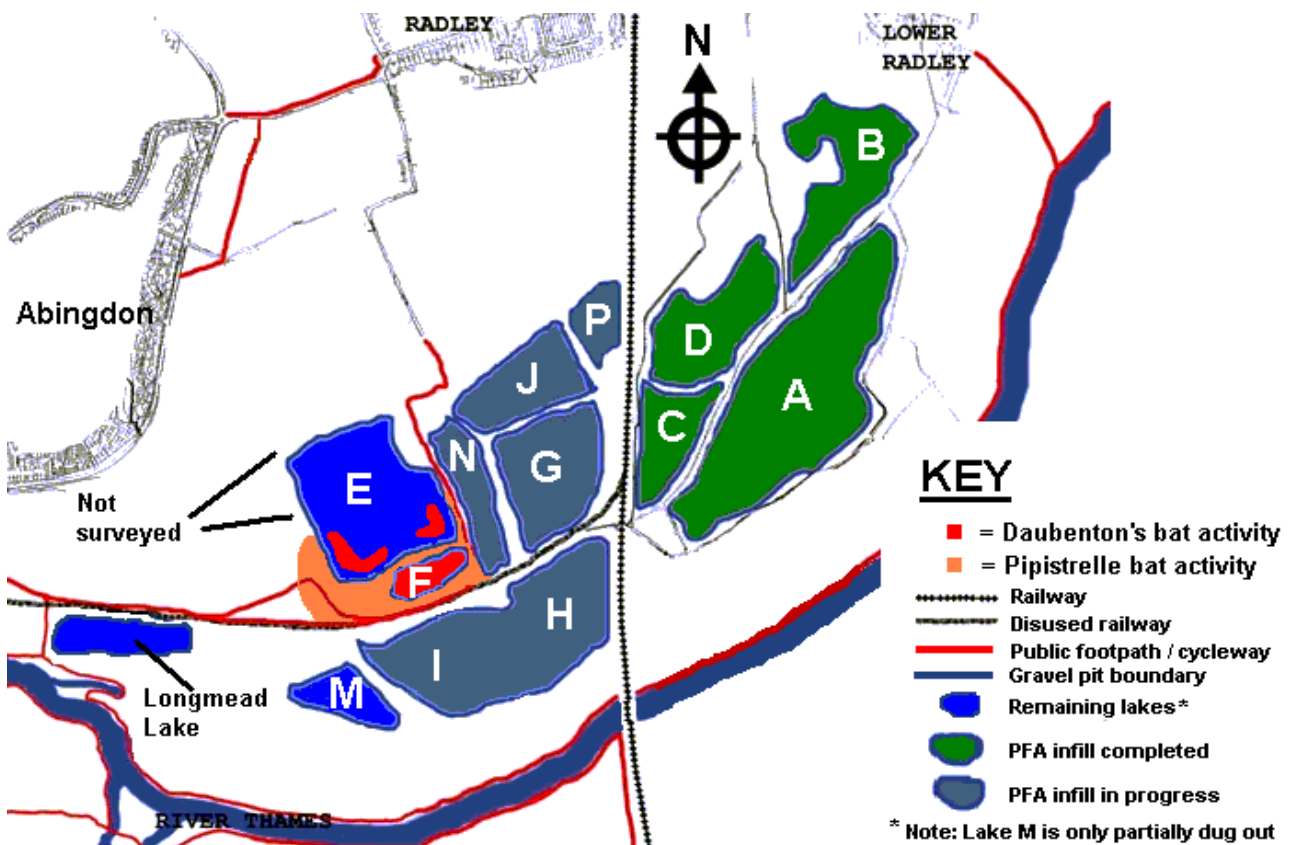


Figure 1: Distribution of Daubenton's bat, *Myotis daubentoni*, and pipistrelle bats, *Pipistrellus pipistrellus* and *Pipistrellus pygmaeus*, visual sightings and bat detector records around Lakes E and F.

OTTERS

One of us, R Eeles, has had an interest in otters, *Lutra lutra*, for over 25 years. Since 1985, he has consistently followed up sighting reports, and interviewed observers, in order to verify records of sightings, to eliminate misidentifications of mink, *Mustela vison*, for example. Increasing frequency of reliable recorded sightings have led him to believe that there is now ample evidence, dating back to at least 2000, that otters visit the Radley Lakes complex and the surrounding area (Figure 2, which shows a selection of recent sightings.). The nature of otter records is such that, because the animals range widely and are present in low numbers, observations are usually chance occurrences and are unpredictable. It is therefore difficult for surveys to determine the full extent of usage of the site. Absence of spraints (faeces) does not mean an absence of otters¹³.

Otter field signs and sightings within 1 km of the Radley Lakes complex, rated as reliable by the authors, include the following:

2000: Sprainting sites and a possible lying-up 'couch' were located by Cresswell Associates¹⁴, ecologists, around Lakes H/I and along the river Thames nearby (centring on NGR SU 523973).

2002: Heard at dawn (splashing), then seen in spring by J Cartmell on the Thames (NGR SU 527971).

2002: Seen during the winter floods along the Swift Ditch by Peter Gent, a dog otter judging by head size, standing on the bank, eating a chub. This animal was apparently accompanied by another otter (perhaps a female), which was calling, but was not seen (NGR SU 505964).

2003: Seen by Ray Faulkner and one other (an Npower employee) late summer/autumn swimming across the Pumney Brook (NGR SU 527974).

2003: Footprints (excellent ones showing unmistakable webbing) found by the author next to the Swift Ditch in June (NGR SU 513967).

2005: Adult and small cub observed to climb out of Lake F and cross over to Lake E by Emma Wiskin in May (NGR SU 519974).

2005: Adult and two cubs (possibly the same as above) seen along the Swift Ditch in June and again in July by Emma Wiskin and her partner, a barbel fisherman (NGR SU 510965).

2005: Footprints, a few days old and not distinct (probable ID) found by R Eeles next to the Swift Ditch in September (NGR SU 513967).

2006: Fish kill characteristic of otter found by R Eeles at SW corner of Lake E in early February.

2006: Otter footprints found and photographed by J Cartmell and B Crowley in shallow water at western end of Lake F in mid February, Figure 3. The footprints were matched for size and shape. Further out, there was evidence of sliding, another otter characteristic.

Taken together, these data suggest a local increase in otter numbers in recent years, and successful breeding is indicated. These records were incidental to other activities and were not the results of otter-specific surveys. Many otter records prior to 2000 are doubtful, in our opinion (there are some exceptions dating back to the 1980's and 1990's

¹³ Kruuk, H. (1995). *Wild Otters: Predation and Populations*. Oxford University Press, Oxford.

¹⁴ Cresswell Associates (2000). *Radley Ash Disposal Site. Ecological Survey of Lakes I and H*. Section 4.0, page 4 and Figure 1.

including spraints found by R Eeles in 1984) and interviews with the observers usually indicate that mink may, in fact, have been seen on many occasions.

The documented occurrence of otters¹¹ in the Lakes H/I area (prior to the infilling of these lakes) in spring of 2000 is perhaps of most interest, as it seems to indicate fairly intensive use of the site at this time. The report in which these observations were made provides the following statement, which is copied here in its entirety, since it is significant:

[Section 4.0, final paragraph]

The presence of otters is a more significant constraint in terms of the Ash Disposal site. Otters are protected under the EC Habitats Directive and the Wildlife and Countryside Act (1981), and are a UK Biodiversity Action Plan (UKBAP) *Priority Species*. It is an offence to kill, take or injure an otter, to disturb it in its place of shelter. The proposed works at Lakes I and H would almost certainly cause disturbance to otters, and would result in loss of habitat available to resident otters. In order to proceed with the infilling of Lakes I and H, it would be necessary to obtain a license from the Department for the Environment, Transport and the Regions (DETR). It would also be appropriate to consult English Nature and the Environment Agency. A license to fill Lakes I and H is unlikely to be forthcoming unless it can be demonstrated that an equivalent area of suitable habitat for otters exists post-development as existed previously. (This will normally involve habitat creation/enhancement schemes in mitigation). It would therefore be appropriate to review the ash disposal strategy at Radley, and to assess the options which exist to dispose of the ash safely, without detriment to the resident otter population.

This report is quite explicit in its recommendations concerning the requirement to ensure sufficient habitat remains for otters in the area. With the loss of Lakes H/I, the only remaining open water habitat of sufficient size and quality, and with islands, in the district occurs as Lakes E and F – where an otter plus cub were seen in May 2005. Importantly, it is precisely this sort of habitat that is of critical importance to females and their cubs, as they spend 80% - 90% of their time in clean water lakes and interconnecting streams. Dog otters rely more heavily upon rivers¹⁵. Otters may have once been present in the 'Lakes' A-D area as well, but since de-watering and infilling with PFA, no otter signs have been observed recently¹⁶.

The proposed infilling of Lakes E and F with PFA will constitute a significant loss of habitat for otters, and this loss is likely to result in a reduction in the probability of otters remaining and breeding in the district. Mitigation, with respect to otters, is not possible, as no other suitable habitats (i.e., open, clean waters plus numerous tree-covered islands, similar to those which were once present in Lakes H/I) occur in the district. RWE Npower appear to have ignored the recommendations of their ecological consultants (Cresswell Associates) in 2000 (see above). They should act on those same recommendations now. The implications of the proposed destruction of Lakes E and F for continued otter recovery, after decades of decline and near extinction in the district, must be fully recognised.

¹⁵ Kruuk, H. (1995). *Wild Otters: Predation and Populations*. Oxford University Press, Oxford.

¹⁶ Bioscan (UK) Ltd. (August 2005) *Radley Ash Disposal Site (Phase 1 Area – Lakes A to D)*. Interim Ecological Report no. E1340R3.

LOCATIONS OF OTTER SIGHTINGS AND FIELD SIGNS (PRE 2006)

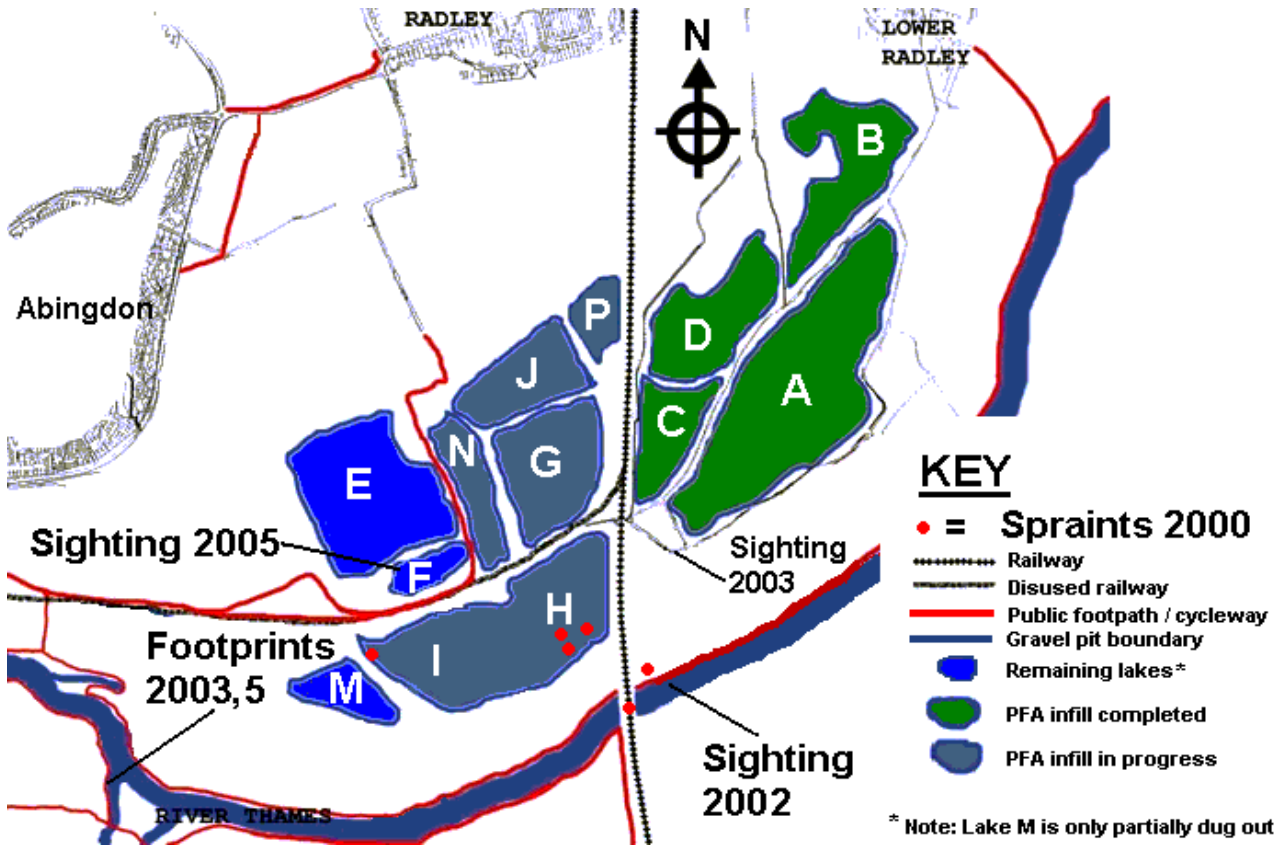


Figure 2: Locations of otter sightings and field signs in the Radley Lakes area up to 2005.



Photograph © J Cartmell 2006

Figure 3: Silt-filled otter footprints in shallow water at western edge of Bullfield Lake (F), February 2006.

WATER VOLES

Significant water vole populations occur along Thrupp Water and Bruney Water to the west of Lakes E and F. A small number of water voles occur in the Lakes E and F site, located mainly along the southern and south-western banks of Lake E, during June, July and August, with sporadic activity along the northern side of Lake F (Figure 4). Footprints, feeding signs (figures 5 - 6) latrines, and tunnels were found in this area by J. Cartmell and B. Crowley. The indicator mark (red dot) for water vole activity on the southeast side of Lake F was of chewed plant stems, which may have drifted into this location from the northern bank. In comparison to Thrupp and Bruney Waters, where numbers approached 'plague' proportions in spring 2005 (R Eeles, J Cartmell, *pers. obs.*), water vole activity is not intense around Lakes E and F. However, only a few years ago, any water voles at all would have been highly significant for this UK BAP *Priority Species*, so the Lakes E and F colony should be viewed in this context. Any water voles at all represent a conservation 'plus'. The local water vole population could be considered to have a high 'buffering' capacity (in terms of their large numbers and long-term 'immunity' from environmental perturbations and excessive predation from, e.g., mink, *Mustela vison*) due to habitat diversity, complexity and the size of the area in question. Water voles are notably more abundant in the Radley Lakes area than they are in the wider district, and hence have an importance above and beyond their actual presence in Lakes E and F. The water voles in the Radley Lakes area are likely to constitute an important source population from which colonisation into less suitable habitats can occur as and when conditions allow.

DISTRIBUTION OF WATER VOLE SIGHTINGS AND FIELD SIGNS

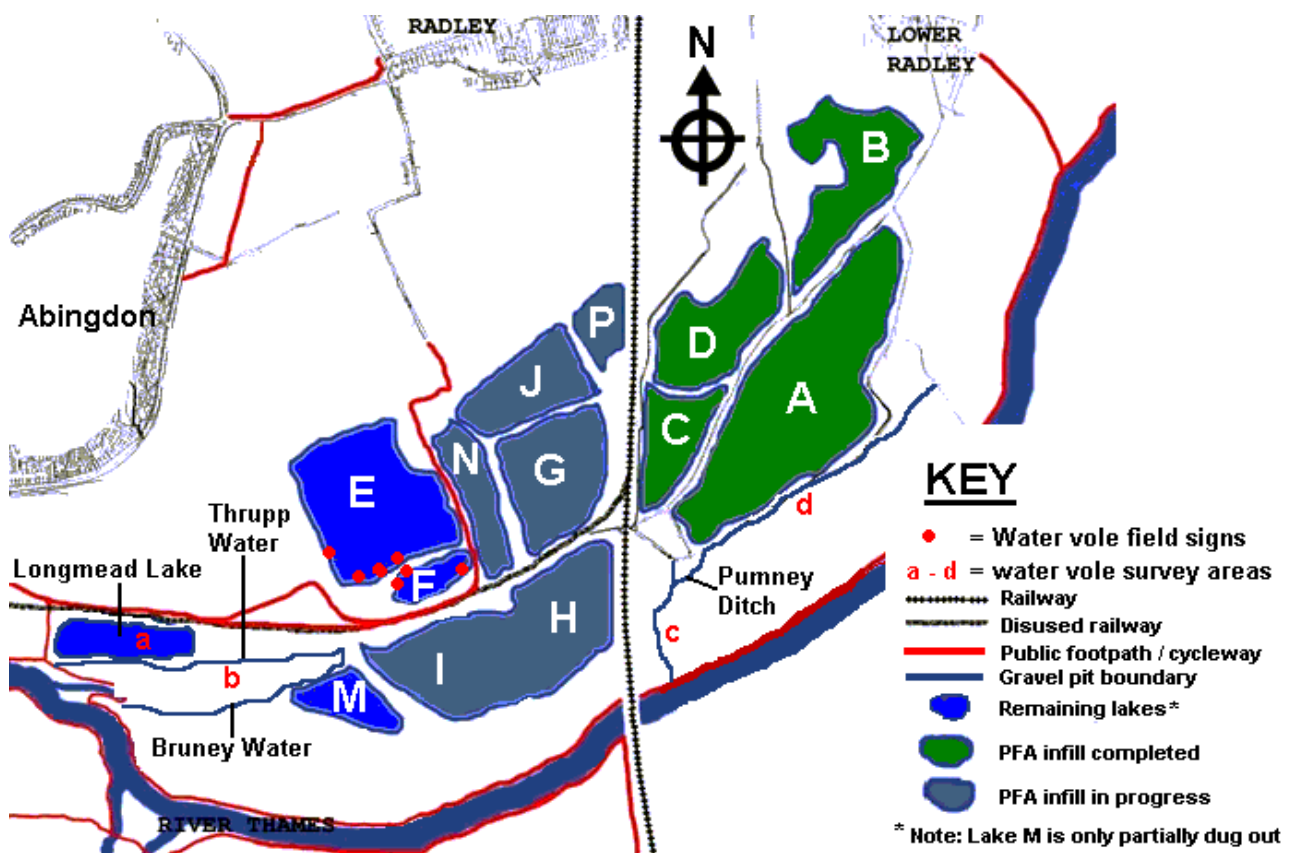


Figure 4: Distribution of water vole sightings and field signs in the Radley Lakes area.

EXAMPLES OF WATER VOLE FIELD SIGNS



Photograph © B J B Crowley 2005

Figure 5: Water vole feeding signs, between lakes E and F, 17 July 2005.



Photograph © B J B Crowley 2005

Figure 6: Probable water vole footprint, found near recent feeding signs on SW shore of Lake E, 29 July 2005.

BADGERS

Badger activity, most probably associated with occupants of the 'bunk-line' sett (NGR SU 525975), is highlighted in orange (Figure 8). This activity, noted between May and September 2005 (and also in previous years) by R Eeles, is of variable frequency and mostly comprises scratching and snuffle holes, plus footprints in wet soil. We have never located dung pits in this area, which is perhaps not surprising in an area where sett/badger density is low and where territorial boundary marking is less of a 'priority' (R Eeles *pers. obs.*). The 'bunk-line' sett has previously been affected by development of Lakes H/I and Lake G and the enclosure of the sites with chainlink fences. In our view, previous mitigation measures were inadequate: The perimeter was marked out to only 15 metres, during the creation of the clay bunds around these PFA lagoons¹⁷. This distance should have been considerably greater, at least 25 metres, in order to be assured that disturbance to the badger sett was minimised. The creation of bunded PFA "lakes" on either side has resulted in a significant reduction in foraging area for the 'bunk-line' badgers. Their creation has also resulted in prolonged flooding of the marshy area in front of the sett, presumably due to impedance of groundwater flow to the south and the damage to the Radley Stream that once connected this marshy area to the Pumney Ditch¹⁸. In consequence, the area around Lakes E and F has seen an increase in badger activity in recent years (R Eeles *pers. obs.*) and this site is probably now of great importance for the continued survival of these animals.

Two badgers were observed by Ray Faulkner, in July 2005, on the northwest corner of Lake E. We are assured by Paddy Docker-Drysdale, of Wick Hall, that there has been a sett in his wood for over 40 years (red spot marked with ?) although we have found only limited excavations by badgers, a few footprints and probable badger paths in, respectively, the wood and along the northern bank of Lake E (which is also used by other animals). Badgers are nightly visitors to the garden of Thrupp Cottages, on the southwest corner of Lake F, and are regularly seen by Karen and Andy Durkin. Badgers approach the house and set off the intruder lights. This garden is of obvious importance to foraging badgers. The owners do not put food down for badgers. It is the invertebrates in the lawns that attract them. There are at least three, possibly four, badger setts in the area of the map, north of the Thames. Other setts occur on the south bank. Badgers have been observed crossing the railway bridge, from Lockwood, over the Thames, in the past (Police Constable Gilligan, *pers. comm.*) but interactions are likely to be infrequent.

There is an obligation for suitably competent surveyors to assess badger activity in the lakes area, as part of any impact assessment. Sufficient foraging areas must be left (average territory size in lowland Britain is about 50 hectares^{19,20} but needs to be larger, ~100-150 hectares²¹, in the Abingdon area because suitable feeding sites are limited. The proposed creation of a PFA complex at Lakes E & F would further reduce available feeding territory, possibly to a critically low level.

¹⁷ Cresswell Associates (Dec 1996). *Badger Survey of Radley Ash Disposal Site: Updated Survey Results*. Cresswell Associates (June 2000). *Radley Ash Disposal Site. Ecological Survey of Lakes I and H*. Cresswell Associates (April 2000). *Survey of protected species around Lake G, Radley Ash Disposal Site, Oxfordshire*.

¹⁸ The Pumney Ditch has become stagnant and species poor since 1999, partly as a consequence of the blocking of the stream between the marshy area in front of the badger sett, which passes underneath the main railway line and into this watercourse. The deterioration in water quality and biodiversity of the Ditch is discussed in: Eeles R M G (2005) *The state of the Pumney Stream*, Save Radley Lakes report SRL/WE/002.

¹⁹ Kruuk H. (1989). *The social badger: Ecology and behaviour of a group living carnivore (Meles meles)*. Oxford University Press, Oxford.

²⁰ Neal E & Cheeseman C. (1996). *Badgers*. T & AD Poyser Ltd., London.

²¹ Eeles, RMG. (1992). *Territory and home range sizes of a colony of badgers at Culham, Oxfordshire, and comparisons with other areas*. Unpublished BSc (hons) thesis.



Photograph © R Eeles 2005

Figure 7: Badger (*Meles meles*) taken on the site in May 1988.

DISTRIBUTION OF BADGER SIGHTINGS AND FIELD SIGNS

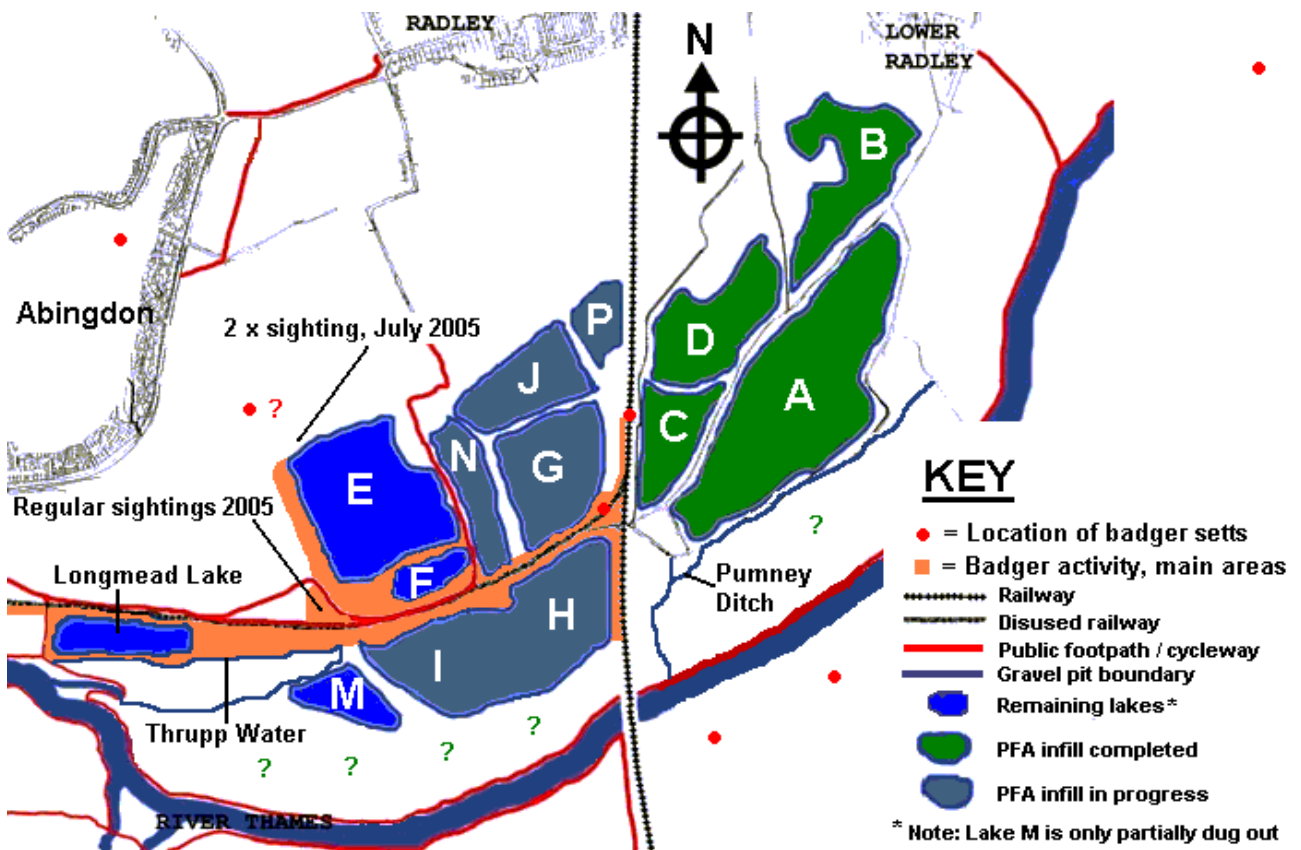


Figure 8: Distribution of badger sightings and field signs in the Radley Lakes area. (? : denotes foraging areas. ? : see text.)

RECOMMENDATIONS

Full ecological surveys are requirements under the Habitats Directive (1992) for bats and otters, and all other protected species listed under this Act and identified in E1340R2, (2005)¹ and SRL/WE/001 (2005, 2006)². Those that have been carried out do not meet the required standards. Likewise, surveys would be necessary in order to assess the impacts of the proposed development on water vole and badger populations, as these impacts are likely to be profound. It is not possible to decide upon mitigation measures without this information. Activity, by the species covered in this report, is apparent in the Lakes E and F area. These two lakes and the surrounding habitats are, in all likelihood, essential for the continued occurrence in the area of otters and, perhaps, the 'bunk-line' badgers. Bats will be seriously affected by additional losses of feeding sites (lakes and surrounding trees) and roosting sites, especially with regard to the species more dependent upon standing water. The previous losses of water bodies and adjacent habitats, due to previous infilling with PFA, has dramatically reduced available habitat to a host of species, several of which are protected by law. Cresswell Associates (2000) gave clear guidance on the likely impact upon the local otter population of the filling of Lakes H/I, for example. Sufficient habitat must be left for them. Our recommendations are, therefore, that,

1. As part of a full Environmental Impact Assessment (EIA) detailed assessments specific to the species covered here should be undertaken.
2. No work should be undertaken in and around Lakes E and F prior to the outcome of such an EIA.

CONCLUSIONS

Previous ecological work at the Lakes E and F site has been of limited scope, and consequently little useful information is available with which to determine the full impacts on mammals of infilling one or both of Lakes E and F with PFA. The requirement for this information is also one in law. The impact of the proposed development will be devastating and will result in the deaths of billions of organisms, amongst which are many that have legal protection. These include the mammals that are the subject of this report. There is clear legal precedent with respect to the requirement by Local Planning Authorities to be aware of, and to apply, the European Habitats Directive, if protected species are found to be present. Both Bioscan¹ and Save Radley Lakes² have demonstrated that this is indeed the case both within and in the vicinity of Lakes E and F.

In the absence of any remaining suitable lake habitats for, e.g., otters, there is no potential for mitigating the effects of the RWE Npower proposal, in which case, under this country's legal obligations set out within, for example, the Habitats Directive, the application must be permanently refused.

**APPENDIX 1: Bat Surveys for Development Proposals in North-East England.
Supplementary guidance note:**

***Surveying for bats following the publication of English Nature's National Bat Mitigation Guidelines (January 2004)*²².**

Appendix 2 of this document, page 14, states:

The implications of the 'CORNWALL CASE' for developments likely to impact upon bats.

Under the habitats regulations (Reg. 3 (4)) all competent authorities in the exercise of their functions must have regard to the requirements of the Habitats Directive. Therefore, local authorities considering a planning application affecting a European protected species are required to apply the requirements of Article 12 and Article 16 before issuing permission. This can only be done with adequate survey effort and ecological information. The local authority could be held negligent in fulfilling its duties if it does not have regard for these requirements. This could trigger a judicial review and a planning permission could be quashed opening the LPA to litigation from the developer. Consequently a LPA can refuse permission if adequate information on protected species is not forthcoming from an applicant because the LPA will be unable to assess impacts on protected species and thus meet the requirements of PPG9 (PPS9) or the Habitats Directive. An application can be withdrawn and resubmitted with the appropriate information.

A recent case in Cornwall (*R v Cornwall CC ex parte Hardy*) confirms this approach, where a high court ruling quashed a planning permission that potentially affected European protected species (bats) because the LPA had not fully considered the ecological information before granting planning permission. The case is an important decision, not least because it is a legal judgement, not just an interpretation by an Inspector or Secretary of State. It confirms that full environmental information must be submitted and considered prior to permission being granted. Where there are grounds to believe that a protected species may be present then it is not acceptable to leave required surveys, impact assessments and mitigation measures to be dealt with by way of a planning condition to be implemented after granting of planning permission. This case was reported in the *Journal of Planning and Environmental Law*, July 2001, p. 786.

²² The full document as available at:

www.english-nature.org.uk/about/teams/team_photo/bat%20survey%20guidance%20march%202004.pdf

APPENDIX 2: Results of a bat survey undertaken by Alison Riggs (ecologist) on the night of 23rd September 2005.

Bats were monitored using a bat detector at 8 points: Points 1 to 4 along a route travelling east from the southwest corner to the southeast corner of Lake F; and points 4 to 8 on a route travelling north along Thrupp Lane from the southeast corner of Lake F to the northeast corner of Lake E (Sandles).

| Location | Time | Species | Notes |
|----------|----------------|--|---|
| 1 | 19:22 | 55 kHz Pipistrelles | Southern path with tree lines edges as flightline. |
| 2 | 19:24 | 55 kHz Pipistrelles | Feeding in small clearing |
| 3 | 19:26 | 55 kHz Pipistrelles | Feeding in another clearing |
| 4 | 19:28 | 55 kHz Pipistrelles | Feeding between the 2 lakes |
| 5 | 19:35 | 55 kHz Pipistrelles | Many foraging. |
| 6 | 19:38 | 55 kHz Pipistrelles + Noctule | |
| 4 | 19:40 | 55 kHz Pipistrelles + Noctule | Noctule not seen but call very clear. Many Pipistrelles feeding. |
| 4 | 19:55 20:00 | – Myotis spp. | Between the Lakes (not seen). |
| 4 | 20:05 | Daubenton's seen on Lake E. 55 kHz Pipistrelles. | Pipistrelles foraging. |
| 7 | 20:10 | 45 kHz Pipistrelles. | |
| 8 | 20:12 | 45 kHz Pipistrelles. | |

APPENDIX 3: Water Vole Baseline Surveys 2005 at Longmead Lake, Thrupp Water and Pumney Ditch

Jo Cartmell

Note: I (Eeles) have added scientific names only to this report by Jo Cartmell, which is otherwise reproduced here in its entirety. The suggestion of a possible pollution influence along the Pumney Brook is entirely that of the original author.

Introduction

Survey results of these areas were very interesting and have made me wonder about the impact of water quality on water vole populations. There are few areas with industrial, residential or agricultural run-off, which undoubtedly helps water voles to thrive, even though they are known to tolerate poor water quality – to a degree. No one is sure why the Abingdon area water vole populations seem to be thriving whilst other areas of the UK have seen a dramatic decline and even extinctions of local populations. Otters are now known to be in the area of Longmead Lake at Swift Ditch and in the Lower Radley area. I think that there may be a link between the otters in this area and the plague of water voles that we have in Thrupp Water and Longmead Lake at present. There has also been a Himalayan balsam, *Impatiens glandulifera*, removal project, initiated by Marjorie White, (Warden of the Abbey Fishponds NR) in nearby nature reserves at Abbey Fishponds and Barton Fields, which has increased plant diversity and is likely to have facilitated water vole recovery in these areas.

Longmead Lake (NGR SU 512972)

The whole of Longmead Lake was surveyed (apart from one small overhanging section) on the 25th April 2005, with Dee Brooks who assisted. Water quality in Longmead Lake appears to be very good: there is unlikely to be any residential, agricultural or industrial run-off. Water depth is variable around the margins from a cm or two to 3 metres further out. Even at the start of the water vole survey season, when the breeding season had just got underway and with vegetation around the lake still establishing itself after the gravel extraction process, there were a good number of latrines and burrows, indicating a good number of water voles present in this apparently ideal habitat. There are plenty of steep, earth banks for water voles to burrow into and the lake edge has many areas of reed and willow. The survey revealed:

- 37 latrines
- 24 burrows
- 59 feeding signs
- 3 areas of coppiced willow around the lake

The willow was coppiced so extensively around the lake (one inch diameter branches had been gnawed clean through at some points) that Bob Eeles considered that it indicated a water vole 'plague' and the survey along Thrupp Ditch (Radley Brook) which runs along the southern end of Longmead Lake proved that there was, indeed, a very high abundance of water voles.

Two water voles were seen on the southern bank on the 30th April 2005.

Bob Eeles informed me recently that coppicing of willows is now occurring along the entire northern edge of Longmead Lake (3rd September 2005), which indicates that there are still high numbers around the lake.

Thrupp Water (Radley Brook) NGR SU 515972

Only one side of this approximately 500-metre long ditch was surveyed along this water vole 'plague' stretch. Latrines were very frequent. Water quality in Thrupp Water appears to be extremely good; water depth is approximately 1.5 metres in the centre. There is currently no intensive agriculture on the north side and the land is under Countryside Stewardship. The ditch itself has a high density of reed sweet-grass, *Glyceria maxima*, and there are good field margins on either side of the ditch with plenty of greater willowherb, *Epilobium hirsutum*, purple loosestrife, *Lythrum salicaria*, and meadowsweet, *Filipendula ulmaria*. There is an absence of steep banks, but there are signs that the reeds are woven into nests in the middle of the ditch, where the water voles feed and raise young. There are very few burrows along this stretch. Water vole signs were as follows:

- 113 latrines
- 8 burrows
- 159 feeding signs

Three water voles were seen on the 1st May 2005 at the western end of the surveyed ditch, by the Thames Path.

Pumney Ditch

I surveyed two (approximately 500 metre) stretches along Pumney Ditch with my co-surveyor David Guyoncourt: on one side only, as advised by BBOWT when water depth is too deep and the bed too silty to safely stand in, as was the case with both stretches here.

Pumney Ditch 1: NGR SU 527971

The first survey on the 2nd June 2005 started at the confluence with the River Thames, heading northeast to a footbridge, which crosses the ditch. Water quality appears to be poor in this ditch, which may be related to the discharge of fly-ash leachate along this stretch. Its depth ranges from 1 metre to 1.5 metres. This discharge, as analysed by the Environment Agency over a period of six years, has contained a cocktail of dissolved elements: arsenic, boron, chromium and vanadium all of which have exceeded permitted levels on frequent occasions under Environmental Quality Standard: EQS2 (a less stringent quality standard for rivers). The herbage was very tall and dense along the edge of the ditch (similar conditions to an earlier survey at Thrupp Water) so I 'scalped' in at two metre intervals in the same manner as the Thrupp Water survey. There was good cover on both sides of the ditch, but the denser areas of *Glyceria maxima* were on the far side. There were few signs of water voles prior to the outflow from the settling pond areas, in spite of there being a reasonable amount of *Glyceria maxima* for the water voles to feed on in the ditch, and plenty of herbage along the bankside. For this stretch up to the bridge there were:

- 8 latrines
- 1 burrow
- 30 feeding signs

I was surprised at the low number of latrines along this stretch, which is undisturbed and has areas along the banks that have dense patches of greater willowherb, meadowsweet, purple loosestrife and hemp agrimony, *Eupatorium cannabinum*. About 20% of the ditch is overshadowed by trees resulting in very little vegetation: no aquatic and very little bankside cover. The water quality did not look good. Water voles are known to be able to tolerate poor water quality, but they do not thrive in such conditions and their population numbers are low, in my experience.

Pumney Ditch 2: NGR SU 528974

My co-surveyor and I continued the second survey stretch from the footbridge on the 16th June 2005. It was very difficult to survey because the herbage had grown considerably in the fortnight between surveys and was very difficult to push through. Again, we 'scalped' surveyed. The stream became notably better beyond the outflow from the settling ponds: the bed of the stream had very dense *Glyceria maxima* cover and was an excellent water vole habitat providing good cover in the ditch. The bankside also had dense herbage and plenty of greater willowherb, meadowsweet, purple loosestrife and Hemp agrimony. We were unable to complete the survey of this ditch due to time constraints, but managed to survey (possibly 85%, it was difficult to tell exactly where we finished).

Along this stretch there were

- 17 latrines
- 4 burrows
- 65 feeding signs

My co-surveyor and I wondered whether water level control at the weir had washed some of the latrines away, because, when the bank profile changed and there was a raised bank, there were latrines along it and burrows where previously there had been less latrines, but obvious water vole tracks alongside the bank.

We both noted a marked change between the area of ditch below the outflow, which flows from the settling ponds to the River Thames and the area upstream of the outflow, which was much better. We intend to revisit the first area to see if there are any water voles on the opposite bank in a reed/marsh area.