



National Trust

Wicken Fen Wildlife

The Recording and Research Newsletter

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Wicken Fen National Nature Reserve, Lode Lane, Wicken, Cambs. CB7 5XP
Visitor Centre telephone 01353 720274, Email wickenfen@nationaltrust.org.uk
www.nationaltrust.org.uk/wicken-fen/

Wicken Fen nature reserve is owned by the National Trust. It currently totals 764 hectares (1887 acres), of which the designated National Nature Reserve is 255 ha and this includes the 163 ha of the core fen habitat on deeper peats that have not been drained for agriculture. The land area of the reserve has increased by more than 2.5-fold since the early 1990s, with the purchase by the Trust of several areas of land which is in the process of restoration to create a much larger nature reserve for wildlife and people.



The very rare Fen Violet was re-discovered in May 2014, at the very location on Verrall's Fen at Wicken where it was last seen in 1999 (photo Pete Stroh).

Introduction

Welcome to the latest annual edition of the Wicken Fen Wildlife Newsletter. The aim of this Newsletter is keep you informed of what is going on and what wildlife is being recorded here at Wicken Fen nature reserve. We hope you find the contents interesting and that you might be encouraged to get involved, come and visit and tell us what you find.

Wicken Fen is managed by a professional team guided by advisors and a highly experienced and knowledgeable Local Committee. In 2014, we welcomed a new Strategic Manager to lead the Wicken team, Joan Childs, who comes to the National Trust with a wealth of experience from working at the RSPB. Joan is also a top notch entomologist, with a special interest in hoverflies.

The 'Research and Recording Group' at Wicken helps to organise and co-ordinate the various scientific, recording and natural history activities on the property.

Contact

Stuart Warrington Newsletter Editor. National Trust Wildlife Advisor [tel: 01284 747520]
stuart.warrington@nationaltrust.org.uk

We hope that this Newsletter will find its way to everyone who has an interest in Wicken Fen. Please do tell Stuart Warrington, if you know of people who you think would like to receive it (postal or email address). Also if you don't want to receive this Newsletter again, just tell Stuart.

In this issue, the re-discovery of the fen violet, focus on flies, tansy beetle re-introduced, Wicken Fen's ecosystem services, new species discovered, bird ringing and nest records, cuckoo book and an update to the Wicken Fen species data on the NBN Gateway.

The weather in 2014

2014 was a much better year than the exceedingly wet 2012, but it was 25% wetter than 2013. Annual rainfall in nearby Cambridge Botanic Garden was 618 mm in 2014, 498 mm in 2013, 813 mm in 2012 and a much drier 380 mm in 2011. The long-term 30 year average annual rainfall in Cambridge is 557 mm, with 150 rain-days per year.

<http://www.botanic.cam.ac.uk/> (click the link to 'The Garden' and then 'Climate & Soils')

Site Management in 2014

A detailed Site Management Report is produced quarterly by Martin Lester (Wicken Countryside Manager) for the Wicken Local Committee, but here are some highlights. Also, the Wicken Ranger team write a blog about their activities which is well worth following; see <http://wickenvision.blogspot.co.uk/>

One of the most significant events in 2014, was the introduction of Wicken's konik horses and Highland cattle to the whole of Burwell Fen. Some of our cattle had been introduced to a small section of this huge area in 2013 and they were joined by family groups of koniks in August 2014. This was quite an operation, run with military precision, to get the animals safely into and out of their transport. It was 6 miles by road, but only 100 metres as the crow flies, but Burwell Lode is in the way! So now in 2015, these animals have over 200 hectares of land across Burwell Fen to graze where they wish.



The Godwin plots, on Sedge Fen, beautifully cut and raked to maintain this long-running experiment.



The path (Drove) by Drainer's Dyke, on the Sedge Fen, cut and raked (October 2014).



The mini-tractor cutting a strip of the Sedge Fen.



Cattle by the new Mere on Burwell Fen, Feb 2015.

When you have livestock, you do get 'events'. Here is a description of one such event with a male Highland that the team had to tackle!

"It has been nearly two years since Mitchell was an entire Highland bull, it seems he still remembers those urges. We think he must have seen Edmund across Harrison's Drove and started displaying by the gate in the corner of Compartment 104. During one of his digging exploits we think he got his horn stuck in the field gate which leads onto Harrison's Drove. Finding himself with restricted movement he must have tossed his head to free himself and in so doing lifted the gate and gate post completely out! Far from then going on the rampage along Harrison's Drove, he simply recognised "his" territory and stood in the gate way bellowing and displaying. We recovered and re-installed the gate whilst Mitchell looked on."

The cutting of the Sedge Fen is an important part of the cycle of work at Wicken. It was so wet in mid-summer that much of the cutting of the fen sedge areas had to be suspended. However, after the dry September, it was possible to get most of the Drovers and the Godwin Plots cut and raked. Several ditches were 'slubbed' too, which is the rotational 'light-touch' clearance of accumulated vegetation and a little silt. By doing this we keep some of the ditches at an early stage of succession, whilst others are reedy and 'late successional'. Different plants and invertebrates favour the ditches at different stages in the succession.

The wetness of the old fen for the last three summers means that we may need new equipment to be able to carry on with the traditional, rotational cutting of the sedge fen.

One much less happy event in 2014 was that an illegal rave was held in and around the old barn on Burwell Fen. Ranger John Hughes wrote about it on the Wicken Ranger Blog.

“Over the first weekend of November a rave took place on Burwell Fen. Clearly this had a considerable impact on the wildlife present on site as well as our ponies and cattle grazing the field next door. Dealing with it, the rubbish and vandalism has taken the best part of a week so far to sort out and is costing a considerable amount to repair. There were cars and vans everywhere too, and quite a lot of damage to the ground and vegetation.

We have filled a big skip with rubbish and bits of fence that were ripped down to gain access to the barn site. A huge amount of rubbish, mostly drink cans and bottles and boxes along with zillions of small gas bottles, balloons and toilet rolls (shudder), the site also doubled as a toilet for the rave. 11 medical grade nitrogen oxide bottles were dumped on site. Adding to the frustration was the fact that quite a bit of the litter was stuck to the barn floor and had to be pressure washed off. With no water or power on site, we had to fill a bowser and hire in a pressure washer.

I spent most of Sunday at Burwell Fen, making sure that people didn't accidentally let our ponies and cattle out by attempting to leave the wrong way, chatting to people down there to let them know that the site is a nature reserve so they might have some inkling of the damage being caused and in general keeping an eye on things. One thing that was evident was the complete ignorance to the level of damage being caused and of the value of the countryside. Numerous people reassured me that they would tidy the mess up, and that they do after such events. Some apologised for the actions of others but the impact of the 1000 people that were estimated to have attended was considerable.

The good news was that we have seen signs that the wildlife is getting back to normal, owl pellets in the barn as well as Barn Owls and Short-eared Owls in the fields nearby, Kingfishers in the ditches, Marsh Harriers overhead and Roe deer roaming about.”



Photos by John Hughes to show the impacts and extent of clear up required after the 'rave'.

The rare Fen Violet re-found at Wicken Fen.

The Fen Violet (*Viola persicifolia* Schreber) is a very rare species in Britain had has been assessed as *Endangered* in Great Britain (Cheffings & Farrell 2005) and more recently as *Critically Endangered* in England (Stroh *et al.* 2014). It used to be found at 20 sites, but now is known from just three (Otmoor SSSI in Oxfordshire, Wicken Fen and Woodwalton Fen in Cambridgeshire). At Wicken Fen there have been sporadic records of the species over the decades, with a run of higher counts in the 1990s, however, despite searches the species had not been seen at Wicken for well over a decade.

The Fen Violet Steering Group led by Drs Camilla Lambrick and Pete Stroh were at Wicken Fen on 19th May 2014 to discuss the conservation of this special species and as part of the visit the group visited Verrall's Fen at Wicken to look at the last site the species had been seen back in 1999. Similar searches had been made in this area in previous years with no luck, but in 2014 near to one of the dipwells (for the fen water table monitoring), tiny seedlings of Fen Violet were spotted and soon afterwards small flowering plants were found growing on the warm, damp peat. 114 plants were counted of which 10 were in flower. This was exactly the same location as the last records in Verrall's Fen, as some small fragments of the plastic markers used at that time were still present.

It is possible that the pleasant spring of 2014 had helped to drawdown the surface water and warm up the peat, so that Fen Violet seeds had managed to germinate, grow and some to flower. Fen Violet is typical of nutrient-poor, periodically disturbed habitats where change is cyclical rather than successional. At Verrall's Fen, the light grazing and trampling by the konik ponies and cattle, plus some occasional scrub management work, will hopefully maintain the right conditions for this lovely little violet. The Fen Violet Group will be back to check on the progress of this endangered species.



The Fen Violet on 19th May 2014.

Note the plants in the gaps in the tall fen vegetation and the damp peat surface.



Photos by Pete Stroh

Birds

Wicken Fen Bird Ringing Group Report of 2014 activities

Chris Thorne

The Wicken Fen (Bird Ringing) Group has been in continuous operation for 47 years, having been founded in 1968. By the end of the year 2014 the overall ringing total was 111,893 and of this total, 614 birds have subsequently been reported away from the Fen (89 of them abroad).

The Group, at 31 December 2014, numbered 37 members and 26 registered Friends or Associates. Additionally there were, at any one moment, about 15-20 would-be ringers/trainees/visitors on the Group's "books". Coverage at the Fen, measured in hours, was lower than in 2013, but this was partly due to fewer ringers "overnighting" (most are too old for that to be as much fun as it was when younger), and partly to the fact that, with experience (and the use of sound-lures), we are becoming more efficient at catching the birds. Ringing operations with nets were conducted on 163 different days, involving 3434 member- (man- & woman-) hours. These netting sessions were held in every month, with the majority of sessions, 93, being carried out on St. Edmund's Fen (Compartments 30-35) while 53 sessions were at the Reedbed (Compartments 51-53). During the winter months 35 sessions were at North Field/Gallops (Compartments 20-23) and 4 at the Brickpits, working from the Roger Clarke Hide (Compartment 24). In the autumn there were also 12 sessions in the more "remote" areas (Burwell and Tubney Fens, Compartments 201-205 and 303-308 respectively). In addition, many days (counted up as 480 hours, this year separated from mist-netting hours) were spent in nest-finding and the subsequent ringing of nestling birds (482 in all) – these involved both nestboxes and open nests, the latter involving almost all areas of the "old" and "new" (vision) Fen.

The 2014 ringing total was 4969 birds of 63 different species. In addition to the 4969 "new" birds in 2014, 689 "retraps" (birds already bearing rings) had been originally ringed at the Fen in years earlier than 2013 and a further 16 were "controls" (birds originally ringed away from the Fen, but captured at Wicken) – so a total of 5674 different birds were handled. Several species topped the 100 mark, the highest scores being Swallow 615 ringed, Blue Tit 494, Meadow Pipit 439, Blackcap 369, Reed Bunting 297, Reed Warbler 293, Great Tit 290, Greenfinch 231, Chiffchaff 176, Goldfinch 166, Wren 161, Robin 131, Blackbird 122, Long-tailed Tit 110 and Chaffinch 101; the next most numerous were Bullfinch 84, Sedge Warbler 81, Long-tailed Tit 80, Dunnock 71, House Sparrow 69, Bearded Tit 67, Lesser Redpoll 66, Redwing 62, Linnet 60, Goldcrest 52 and Pied Wagtail 41.

The Meadow Pipit, Bearded Tit and Linnet totals are all-time Wicken records, while that for Blue Tit equals the former record (from 2010). Other Wicken Fen ringing records broken in 2014 were the 21 Barn Owls, 22 Yellow Wagtails and 7 Jackdaws.

The more "unusual" species, normally ringed in small numbers, remained much the same as in recent years: Sparrowhawk 5, Kestrel 1, Hobby 1, Water Rail 1, Collared Dove 2, Cuckoo 7, Kingfisher 9, Green Woodpecker 5, Grasshopper Warbler 3, Jay 2, Tree Sparrow 3, Siskin 1, Mealy Redpoll 3 and Yellowhammer 4. Birds caught in 2014 after a longish absence from the list were the single Nightingale, Whinchat, Mistle Thrush and the two Carrion Crows and Stonechats. No new species was added to the Group's ringing list which thus remains at 106 species.

A simple look at the annual ringing totals does not give more than the sketchiest summary of the year, in comparison with former years (the Group's Standard Sites and the more recent Constant Effort Sites provide this data more accurately), but 2014 totals suggest that, while several of the mainly all-year residents remained at (Blackbird, Song Thrush, Tree Creeper) or above (Wren, Dunnock, Robin, Cetti's Warbler, Bullfinch) 2013 levels, the summer and winter visitors were much more variable. Of the former, Lesser Whitethroat, Blackcap and Chiffchaff increased, but Grasshopper Warbler, Sedge Warbler, Reed Warbler, Whitethroat, Garden Warbler and Willow Warbler all declined. The numbers of winter birds caught is very dependent on ringer effort, but 2014 produced more Goldcrests, Redwings, Fieldfares and Greenfinches; but fewer Chaffinches and Lesser Redpolls (but 2013 of course was a rather special Redpoll winter).

A number of the species caught in large numbers were, as is nowadays usual, those repaying a lot of effort by a small number of dedicated Group members, using lure calls in the autumn (after the end of the Constant Effort Sites sessions) at the Reedbed, Burwell and Tubney Fens. These efforts produced 439 (i.e. all) of the Meadow Pipits, 379 of the Swallows, 139 of the Reed Buntings and 27 of the Linnets.

During 2014 we received news of the origins of some ringed birds recently trapped at Wicken Fen (although there seems to be a backlog of data from abroad – we are still awaiting information on two warblers from France) – Swallows from Cleveland, Durham, Worcestershire and Suffolk, Reed Warblers from Hertfordshire and Peterborough, Reed Buntings from Suffolk and Hertfordshire, Blackcaps from Lancashire and Hertfordshire, Lesser Redpolls from Suffolk and a Chiffchaff from Suffolk. The total of ringed “imports” to Wicken Fen during the lifetime of the Group so far, stands at 276, with 21 of these coming from abroad.

28 Wicken-ringed birds were reported from elsewhere in 2014, 5 of them from abroad (a Redwing, a Goldfinch and a Sand Martin to France; a Reed Warbler to Spain and a Robin to the Netherlands). Domestic travellers were Swallows to Hertfordshire and Sussex, a Song Thrush to Norfolk, a Reed Warbler to Hertfordshire, a Sedge Warbler to Sussex, Reed Buntings to Suffolk, Blackcaps to Norfolk and Suffolk, a Chiffchaff to Hampshire and a Lesser Redpoll to Nottinghamshire. A further eleven birds moved to other parts of Cambridgeshire, sadly some falling prey to cats or to traffic.

Longevity records broken in 2014 were a Jay at 7 years 7 months, a Cetti's Warbler at 7 years 1 month, a Blackcap at 6 years 11 months and a Bearded Tit at 3 years 11 months; a Robin came close to its record at 7 years 3 months. The oldest birds (or rather the longest intervals between ringing and recapture) of other species were a Long-tailed Tit at 6 years 10 months, Chaffinch at 6 years 8 months, a Blackbird at 6 years 7 months, a Bullfinch at 6 years 4 months, a Blue Tit at 5 years 2 months, a Reed Warbler at 5 years 1 month and a Reed Bunting at 5 years 0 months.

In 2014, for the fourth successive year, Constant Effort Sites monitoring of the birds at the Reedbed (REECES) was carried out. An analysis of the 2014 work broadly confirmed the general Wicken Fen picture with, for example, Reed and Sedge Warbler numbers down, but Blackcap and Chiffchaff numbers up. As foreshadowed in the 2013 Report, the Standard Sites Sessions at St. Edmunds Fen (4 monthly 24-hour netting sessions) were abandoned in 2014, but replaced with a second CES (STECES), following the same pattern as REECES, with twelve 8-hour sessions at approximately 10-day intervals. With two CES projects, operating for the same period of time, and using a similar quantity of nets, some comparisons are possible. And, as with REECES already, year-by-year comparisons will also soon be possible.

A small, but dedicated, number of Group members continued the task of digitizing the backlog of the Group's ringing and retrap data (going back to 1968). This is now nearing completion (last year's Report statement was premature!).

The Group remains most grateful to the National Trust for granting permission for ringing on the Reserve, and for assisting with expenses. In turn, the Group in 2014 assisted the National Trust staff by putting on ringing demonstrations for visitors to the Fen, including some at the Roger Clarke Hide. The University of Cambridge, in their turn, made a significant financial contribution to the National Trust, to assist with scientific studies at the Fen (the Ringing Group qualifies under this heading). Group members also collaborated with Anglia Ruskin University for a third year by demonstrating ringing to its MSc (Animal Behaviour) students. Some Group members, assisting with bird-ringing away from the Fen (at Michael Holdsworth's sites, with the Wash Wader Group and with the Nene Washes Corncrake studies) were able both to gain more experience, and to contribute expertise. Specific scientific support was also given, by Group members, to the University of Cambridge Madingley studies – those on Great and Blue Tits under the leadership of Dr. Hannah Rowland in Madingley Wood, and also those on Jackdaws under Ms. Gabrielle Davidson and Ms. Alison Greggor at Madingley Hall.

Anyone interested in joining the Group is welcome to contact Dr. Chris Thorne at St. Catharine's College, Cambridge, CB2 1RL (phone 01954 210566, email cjrt@cam.ac.uk).



Barn owls had a good year at Wicken Fen in 2014.

A lovely murmuration of starlings could be seen in the winter months at dusk at Tubney Mere, with upwards of 12,000 birds present.

Also, in the winter, the harrier roost on the Sedge Fen was often occupied by 5 or more hen harriers and 3 or 4 marsh harriers.

Nest Record Summary, 2014.

Carole Davis
Wicken Fen Nesting Group

A small number of volunteers from Wicken Fen Group continued the nest recording activities of the group, finding and monitoring nests from a range of species across the Fen. The group is continuing to gain knowledge and experience in nest finding which, alongside the favourable weather during the breeding season in 2014, resulted in a substantial increase in the number of nests monitored from previous years.

The weather patterns in 2014 were more favourable than for the previous two years with the temperature up a degree or two on the five year average. According to the British Trust for Ornithology, a mild winter was followed by favourable weather for the majority of the breeding season (BTO 2014).

The nesting activities on the Fen can be split into three groups:

Small boxes: There are more than 80 small nest boxes used by Blue Tits and Great Tits (and, to a lesser extent, Wrens) sited mainly at St Edmunds Fen but with a small number also at Gallops and at the Reedbed pools.

Large boxes: There are several large boxes spread at various locations across the Fen to encourage Barn Owls but which are also often used by Jackdaws and Stock Doves.

Open nests: The most difficult challenge is the location of open nests of passerines. In 2014, the group again focussed on specific areas of the fen including parts of St Edmund's Fen and the short scrub at the far end of Monk's Lode. A record number of 83 open nests were found and monitored in 2014.

Small Boxes

As usual, this required some maintenance work to repair and also relocate some of the boxes, ready for the breeding season with weekly monitoring of the boxes carried out from early April until the last broods fledged.

Of the 83 nests monitored, 50 reached egg laying stage. Of these only two were predated (compared to 26 in 2013). 29 Blue Tit nests producing a total of 223 young, 205 of which were ringed and 21 Great Tit nests producing a total 134 young, 123 of which were ringed (with three nests of unknown outcome). As can be seen from Table 1, this was an outstanding year compared to all previous years (from 2009) with almost no predation as in previous years. In addition one of the nest boxes at the Reedbed pools was successfully occupied by Wrens, five pulli of which were ringed.

Table 1 Summary of results from Great Tit and Blue Tit nest boxes 2009 to 2014

Great Tit					Blue Tit				
Year	No. of nests occupied	Average no of eggs	Total no of birds fledged	Success rate	Year	No. of nests occupied	Average no of eggs	Total no of birds fledged	Success rate
2009	21	5.2	75	48%	2009	18	5.3	43	39%
2010	23	6.8	76	52%	2010	18	7.3	93	72%
2011	21	8.1	74	52%	2011	20	8.6	119	65%
2012	23	7	36	22%	2012	26	7.2	41	19%
2013	18	5.5	22	28%	2013	25	8.5	85	40%
2014	21	8.0	134	100%	2014	29	8.6	223	93%

NB number of birds fledged is a minimum number given there is no final outcome for a small number of nests.

Large Boxes

Several changes to the barn owl boxes were made in 2014. The barn wall at Priory Farm was demolished by winds early in the year and the barn owl box was reported as being damaged beyond repair. New gates have been erected at Priory Farm and the decision has been made to curtail our visits to this site due to a combination of factors including the new gates and the loss of the barn owl box. The little owl box remained unvisited and no attempt was made to monitor the smaller barns for swallows.

Nesting was underway from the earliest visit in April and it was clear that Barn Owls were making the most of the early warm spring following two poor breeding seasons in 2012 and 2013. Although no owls used the traditional tank site in the barn on Burwell Fen, one of the new boxes on the Fen had a pair which produced seven young. The box in the Badcock's barn produced six young and at Guinea Hall the early clutch of five was followed by another of six young. As far as can be ascertained, all the pulli fledged successfully.

The high productivity in these two barn owl boxes reflects the BTO reports that levels of productivity of Barn Owls are up by 40% and that, by October 2014, volunteers had ringed more Barn Owl chicks than any previous year (BTO 2014).

Stock Doves occupied at least three nests fledging five young. On Burwell Fen, a pair made use of the vacated tank to raise two single chick broods and another pair raised two chicks in the kestrel box. After

fledging, this box survived both falling from the rafters and use as a seat during the illegal rave. Senior Ranger John Hughes erected two new barn owl boxes on poles along the centre of the Fen partly to mitigate the loss of this box.

In contrast to previous years, during which several broods of Stock Dove pulli had been raised and ringed in the owl box in the Oily Hall barn, there was no evidence of breeding at this site in 2014. No Stock Doves were seen during several visits to the box. Jackdaws had fewer nests than previous years, but with larger clutches including four young raised in the jackdaw box and three more in John's second barn owl box. Over the coming winter, there are some repairs and cleaning to be done and opportunities to investigate for the possibility of erecting more jackdaw boxes, possibly making more use of the outer barn on Burwell Fen.

Open nests

The 2014 nesting season got off to a more typical start (according to the preliminary report of the 2014 breeding season published by the British Trust for Ornithology), after the breeding season in 2013 had been noticeable for being exceptionally late, probably owing to unusually low temperatures in April and May. As in previous years, group members spent many hours at locating nests and carrying out repeat visits to nests to collect data on timing of breeding and productivity. Nest-finding was done by searching or watching, often in combination. Overall, 83 nest records were collected by the open nest finding team with the highest number being 18 nests of Chiffchaff. Of the larger and more obvious species: Mute Swans nested at Pout Hall and both Coot and Great-crested Grebes were present, though no chicks of either species were seen. Common Terns were present on the Pout Hall raft and, for the third year, produced three chicks. In addition to those nests monitored, some nesting attempts were encountered but not recorded because the nests themselves were not found. A pair of Little Grebe exhibited nesting behaviour all spring and summer on the ponds at the end of Monks Lode and small young were seen with a pair of adults in early August. Garden Warblers and Cetti's Warblers were seen feeding newly-fledged young but the nests were not found.

Many thanks to Carl Barimore, Ann Beeby, Neil Larner and Alan Wadsworth for their significant contributions to this report.



A view eastwards over the **Wicken Fen** reedbeds (lower left) and beyond to the Mere and the flooded areas of Baker's Fen. Through the centre is Burwell Lode. On the right side is the new shallow mere on Burwell Fen which has proved to be very attractive to birdlife. The central triangular pond is Pout Hall.

Cuckoo

Cheating *by* nature

By Nick Davies

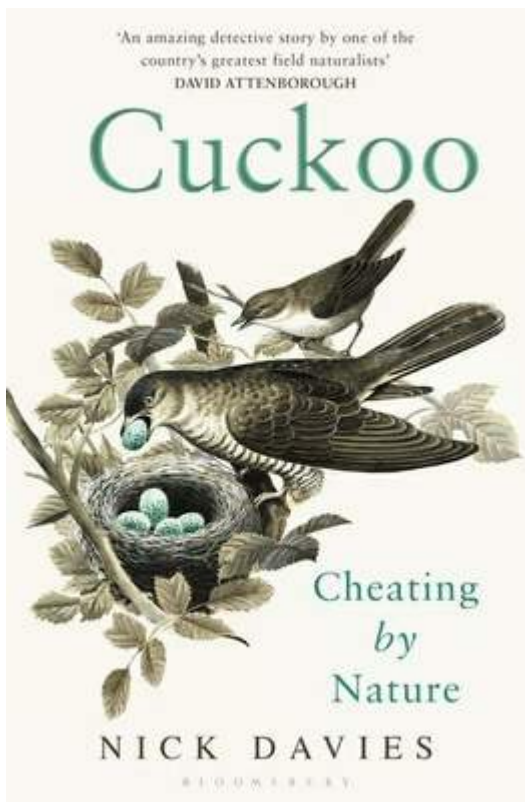
www.bloomsbury.com/uk/cuckoo-9781408856567/

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Nick Davies is Professor of Behavioural Ecology in the Department of Zoology at the University of Cambridge.

In March 2015 he published the definitive book on Cuckoos, based on over 30 years of research, much of it carried out at Wicken Fen.

In this enormously engaging book, naturalist and scientist Nick Davies reveals how cuckoos trick their hosts. Using shrewd detective skills and field experiments, he uncovers an evolutionary arms race, in which hosts evolve better defences against cuckoos and cuckoos, in turn, evolve novel forms of trickery. This is a fascinating corner of Darwin's 'entangled bank', where creatures are continually evolving to keep up with changes in their rivals. Cuckoo offers a new insight not only into the secret lives of these extraordinary birds, but also into how cheating evolves and thrives in the natural world. It reveals how Wicken's reed warblers are locked in an evolutionary arms race in The Fens with the female cuckoo.



Focus on Flies (Diptera)

The true flies are the most species-rich insect group at Wicken Fen. This we know thanks largely to the work of Ivan Perry, an expert dipterist who spent several years surveying and compiling a superb faunal list of flies found at Wicken Fen. However, in recent years, we have been able to add quite a few new species to the list, primarily from the survey work of Peter Kirby both on the old fen and on the restoration land. In 2013 Peter was commissioned to focus on the reed-dominated habitats at Wicken and this has turned up a number of new and scarce species for the nature reserve. In addition, a specialist ‘carrion-fly’ survey was carried out by Carys Breeze, a student from Newcastle University, and her baited traps brought in several new species. Also, two new hoverflies were found, so in 2013 and 2014, this has added 40 new Diptera species to our site list and raises the total to a very impressive **2,018 species**.

Cigarillo Gall-flies (family Chloropidae): These flies cause a distinctive gall (a swelling) in the stem of common reed (*Phragmites australis*). Unusually, all three species of *Lipara* that occur in Britain can be found at Wicken Fen: *Lipara lucens* (the most widespread species), *Lipara rufitarsis* (nationally scarce) and *Lipara similis* (the rarest species, RDB2 Vulnerable and a species of conservation concern (S41)). All three were found to be present at several places in and around the Wicken reedbeds in summer 2013 by Peter Kirby during his survey of reed habitats at Wicken, both in sweep net samples and in window traps. *Lipara similis* is a speciality of the Cambridgeshire and Suffolk fenland reedbeds and Wicken Fen is an important stronghold of the species.



A Cigarillo Gall in the stem of common reed caused by one of the *Lipara* fly species.

These species only develop strong populations in places where there is plenty of common reed that is infrequently cut, as the species require the stems to stand for two or more seasons. The galls also support a community of associated species that use the micro-habitat created by the *Lipara* flies.

Reader, T. (2003) Strong interactions between species of phytophagous fly: a case of intraguild kleptoparasitism. *Oikos* **103**: 101-112. [studied *Lipara* galls, Wicken was one of the field sites]

Hoverflies (Diptera: Syrphidae)

The spectacular hoverfly *Volucella zonaria*, the largest of the UK's hoverfly species, was discovered new to Wicken Fen last summer. Joan Childs photographed a specimen feeding on a bramble flower on the north side of the reserve at Spinney Bank (TL550708) on 07/08/2014 (see next page).

The dipterist G.H. Verrall had bought several parts of the sedge fen and when he died in 1910 he owned 220 acres, all of which he bequeathed to the National Trust. Interestingly, Verrall, who collected hoverflies at Wicken Fen, could not envisage that *V. zonaria* would ever become a British species. He was aware of two specimens, purportedly from the New Forest, but he did not believe that this was the case and he reported that they were removed from the British collection. He lists *Volucella* species known from Britain, or with a potential to colonise, in his book of 1901; *V. zonaria* was not among them. However, during the 1940s *V. zonaria* did indeed become established in the London area, a few areas on the south coast and Bristol. Since then it has undergone a rapid range expansion, likely reinforced by further influx from the continent, reaching as far north as Hull and Cheshire. The larvae of this species are scavengers and predators in the nests of social wasps. The adults fly in high summer, peaking in July and August, and are well worth looking out for feeding on flowers.

We now have four *Volucella* species at Wicken, *bombylans* (1st record pre-1910, many records since then), *inanis* (1st record 2002), *pelluscens* (1st record 1977) and *zonaria*.

Two other hoverfly species have been added to our lists recently. Joan Childs discovered *Epistrophe nitidicollis* in Little Breed Fen (TL560710) on 28/04/2014. A PhD project by N. Dalton (Univ Bristol) on pollinators discovered *Meliscaeva cinctella*, new to Wicken with 1 male visiting *Angelica sylvestris* flowers on the Sedge Fen (TL553702) on 27/08/2013 (identification was checked by expert D. Gibbs). Joan Childs made the 2nd site record of *Epistrophe diaphana* on 22/06/2014 (the 1st was in 2010) on St Edmunds Fen (TL563704). This is a nationally notable (scarce) species, although it appears to be spreading.

This brings the Wicken hoverfly list to 123 species, and 1555 separate records, of which one species is Red Data Book (*Anasimyia interpuncta*) and nine are nationally scarce. However, our last record for eight of our 123 hoverfly species is pre-1980, so we are not sure that they are all still present.



Left: The spectacular hornet-mimic hoverfly *Volucella zonaria* feeding on bramble blossom at Wicken Fen in 2014 – the first record for the reserve. Record and photo by Joan Childs.

Right: The rare hoverfly *Anasimyia interpuncta* which is widespread at Wicken Fen.

Other Diptera (flies)

Carys Breeze, set 100 carrion (meat) baited bottle traps in Evan's Fen (TL543696) from 10 to 17/08/2013 as part of a research project for the University of Newcastle. This unusual survey method produced several interesting records, such as four blow-fly (Calliphoridae) species new for Wicken Fen;

Bellardia viarum (8 specimens recorded), *Lucilia sericata* (4 specimens), *Melinda gentilis* (57 specimens), *Pollenia amentaria* (1 male specimen) and also two new flesh-flies (Sarcophagidae) *Sarcophaga agnata* (12 specimens) and *Sarcophaga depressifrons* (1 male specimen).

The most abundant species in the survey with 237 specimens was *Muscina levida* (Muscidae), a common house-fly and then the widespread *Melinda gentilis* (above).

Bibio anglicus (Bibionidae): A new species of 'St Marks-fly' for the Wicken list. Peter Kirby swept it from the willow scrub on the side of the reedbed on Adventurers' Fen (TL551695) on 13/05/2013.

Dolichopus lineatocornis (Dolichopodidae): A new rare (RDB near threatened) species for the Wicken list, swept from common reed *Phragmites* by Peter Kirby, on 26/06/2013 in Adventurers' Fen: Cmpt 52 (TL549695).

Dolichopus claviger (Dolichopodidae): A new species for the Wicken list, Peter Kirby found it in a pitfall trap set 20/06 to 08/07/2013, in dense *Phalaris*-dominated vegetation in Adventurers' Fen (TL549693).

Sybistroma crinipes (Dolichopodidae): A new species for the Wicken list, Peter Kirby swept it from vegetation fringing a large pond in the Adventurers' Fen reedbed (TL550692) on 26/06/2013.

Thrypticus nigricauda (Dolichopodidae): A new Nationally Scarce species for the Wicken list, Peter Kirby took it in a suction sampler used in tall marginal vegetation of a large pond in Evan's Fen (TL544695) on 24/06/2013.

Empis albinervis (Empididae): A new species for the Wicken list, Peter Kirby found it in a window trap set 14/05 to 30/05/2013, in an open space amongst Salix scrub in the reedbed, Adventurers' Fen (TL548697).

Hilara longifurca (Empididae): A new species for the Wicken list. Peter Kirby swept it from vegetation fringing a large pond in the Adventurers' Fen reedbed (TL550692) on 26/06/2013. This is a very local fly, with a stronghold in the Broads, so this discovery in the Cambs fens is a significant range extension.

Suillia flavifrons (Heleomyzidae): A new species for the Wicken list. Peter Kirby beat it from willow scrub on the north side of the Adventurers' Fen reedbed (TL549697) on 30/10/2013.

Tephrochlamys tarsalis (Heleomyzidae): A new local species for the Wicken list and probably a first record for Cambridgeshire. Peter Kirby swept it from vegetation fringing a large pond in Evan's Fen (TL544695) on 30/10/2013.

Bicellaria nigra (Hybotidae): A new 'dance-fly' species for the Wicken list. Peter Kirby swept it from willow scrub in two spots, edge of the Adventurers' Fen reedbed (TL549697, TL551695) on 27/09/2013.

Macrocera nigricoxa (Keroplastidae): A new, very local 'fungus-gnat' species for the Wicken list. Peter Kirby swept it from the willow scrub, edge of the Adventurers' Fen reedbed (TL551695) on 27/09/2013.

Gonomyia bifida (Limoniidae): A new nationally scarce 'crane-fly' species for the Wicken list. Peter Kirby took it at two locations in Adventurers' Fen (TL552697 on 20/06/2013; TL549695 on 26/06/2013). This species is generally associated with seepages in wooded or scrubby areas in southern Britain.

Molophilus bihamatus (Limoniidae): A new nationally scarce 'crane-fly' species for the Wicken list. Peter Kirby took it at two locations in Adventurers' Fen (TL547696, TL550694) in window traps set beneath willow shade, run from 20/06 to 08/07/2013.

Anticheta atriseta (Sciomyzidae): This very scarce 'snail-killing' fly was taken in three locations by Peter Kirby in Adventurers' Fen at Wicken in 2013, new to Wicken and to East Anglia. On each occasion it was found in a window trap. Set 14 to 30/05/2013, wetland vegetation pond margin TL545695; 14 to 30/05/2013, edge of a *Phragmites* bed TL548696; 20/06 to 08/07/2013, amongst Salix scrub by a ditch TL548697.

Pteromicra leucopeza (Sciomyzidae): This very rare (RDB2 Vulnerable) 'snail-killing' fly was taken by Peter Kirby in a window traps set from 29/07 to 22/08/2013 on a path margin, on the edge of the Adventurers' Fen reedbed (TL548696). New for Wicken Fen list, but is found in the Broads.

Sciomyza dryomyzina (Sciomyzidae): Another very rare (RDB2 Vulnerable) 'snail-killing' fly new to Wicken. Peter Kirby trapped it (3 in pitfalls, 2 in window traps) on five occasions in July to September 2013 around the reedbed in Adventurers' Fen (TL5569 and TL5469).

Oxyna flavipennis (Tephritidae): A new nationally scarce 'fruit-fly' for the Wicken list. This was swept from south bank of Wicken Lode at Verrall's Fen (TL548697) by Peter Kirby on 26/06/2013.

Call for Dipterists!

Wicken Fen is holding a Diptera recording weekend 27 and 28 June 2015 with an option to record also during the preceding week. Details of overnight accommodation can be provided if required (B&B or local pubs). Please let me know if you are interested in coming: **Joan Childs**
Strategic Manager, Wicken Fen, Lode Lane, Wicken, Ely, Cambs. CB7 5XP
Tel: 01353 720274. Mobile: 07785 654137 joan.childs@nationaltrust.org.uk

The Tansy Beetle *Chrysolina graminis* is re-introduced to Wicken Fen

Probably the most significant event for invertebrates at Wicken Fen in 2014 was the joint project between the National Trust, Buglife and the Tansy Beetle Action Group (TBAG) to re-introduce the Tansy Beetle *Chrysolina graminis* (Chrysomelidae) to Wicken Fen. *Chrysolina graminis* was added to the UK Biodiversity Action Plan list in 2006 and to the England's Priority Species ('Section 41, NERC Act') list in 2007, due to its rarity and extinction threat evident from the huge decline in its range. The species was last recorded at Wicken Fen in 1982, however, a small number were re-discovered at Woodwalton Fen in summer 2014, and it has its only true stronghold along the River Ouse around York.

Lack of food plant is not thought to be a factor in its decline, as all potential food plants (tansy, gypsywort, water mint) can be very abundant. However, the beetle seems very reluctant to fly and it needs to walk between potential food plants, so it is vulnerable to habitat fragmentation and to deep floods should the plants get submerged. Research at York has also shown that its eggs and larvae are vulnerable to predation, especially by ants on drier sites, which may explain its preference for wetlands. At Wicken, we suspect it declined in the period from 1970-82 as the fen was getting too dry and scrub-invaded. These two issues have been largely resolved since the 1990s by conservation work, such as the installation of the impermeable membrane along the north banks and the large-scale scrub removal project.

The primary aim of establishing a population at Wicken Fen was to decrease the vulnerability of this species to catastrophic flood events at its core River Ouse, York sites. So, in September 2014, about 150 adult tansy beetles (half captive-bred, half wild caught after a bumper York season) were brought down the A1(M) (in buckets) by Geoff and Roma Oxford, who have been leading the conservation of this species at York. They were carefully placed on gypsywort and water mint plants in an area of the Fen that looked highly suitable. We will be checking if they successfully emerge from hibernation in May of this year.



A tansy beetle *Chrysolina graminis* on water mint at Wicken Fen, in Sept 2014 (photo: S.Warrington).

These beetles are about 10mm in size and have a lovely iridescent sheen.

There is a similar and related species *Chrysolina herbacea*, the mint leaf beetle, which is much more common and widespread. A careful examination of the puncturation on the pronotum is required to separate the species.

Interesting species records at Wicken Fen

Further beetle records

These records come from a variety of sources and include surveys from the last two years that we have not reported in a previous Newsletter.

Aderus populneus (Aderidae): A nationally scarce, saproxylic (associated with dead and decaying wood) beetle, new to Wicken, when taken in the St Edmunds Fen: Education Area (Cmpt 30) TL564703 by Mark Telfer on 28/09/2013.

Anisoxya fuscata (Melandryidae): A nationally scarce, saproxylic beetle, new to Wicken on 08/09/2013 from an ash tree on Adventurers' Fen at TL555694 by Mark Telfer. Also at the same spot, same day, *Orchesia micans*, also nationally scarce, a species that was last recorded at Wicken in 1898.

Sepedophilus testaceus (Staphylinidae): A nationally scarce, saproxylic beetle, new to Wicken. 28/09/2013 in 2 locations, St Edmunds Fen: Education Area (Cmpt 30) TL564703 by Mark Telfer, and Guinea Hall Cmpt 108 TL571700, from a white-rotted *Salix* trunk by David Buckingham.

Agaricochara latissimi (Staphylinidae): New to Wicken. Adult taken from *Trametes versicolor* (a bracket fungi) on *Salix* (willow). St Edmund's Fen: Cmpt 33 TL570701 by Mark Telfer on 28/09/2013.

Amischa nigrofusca (Staphylinidae): New to Wicken. Adult female found by Mark Telfer in Inonotus brackets on a mature Ash tree on 08/09/2013 at Adventurers' Fen: Cmpt 42 TL555694.

Oxytelus fulvipes (Staphylinidae): A nationally scarce rove beetle, new to Wicken, in pitfall traps set 14 to 30/05/2013 on a path margin, edge of Adventurers' Fen: reedbed TL548696 by Peter Kirby.

Aspidiphorus orbiculatus (Sphindidae): New to Wicken. Saproxylic. Found by Peter Kirby in window traps in several sites in Adventurers' Fen (such as TL549693, TL550692, TL550694 on 08/07/2013) and also by Mark Telfer, sieving woodchips on 08/09/2013, Adventurers' Fen at TL563690.

Eपुरaea biguttata (Nitidulidae): New to Wicken. Saproxylic. Adult female found by Mark Telfer in Inonotus brackets on a mature Ash tree on 08/09/2013 at Adventurers' Fen: Cmpt 42 TL555694.

Hallomenus binotatus (Tetratomidae): New to Wicken. Saproxylic, nationally scarce. Found by Peter Kirby in a hand search of *Laetiporus sulphureus* fungus on an old willow Adventurers' Fen: trackway TL551696 on 20/06/2013.

Elater ferrugineus (Elateridae): This large, spectacular and very rare 'rusty-red click beetle' was discovered new to Wicken Fen in 2013, but an interesting extra record was when 2 males came to a pheromone lure set by Stuart Warrington on 14/07/2014 at Adventurers' Fen (TL558696) some 250m away from any sizeable tree. They came flying-in at 3pm only 10 minutes after the lure was opened on a hot, still, humid day (25 C).

Saproxylic soldier beetles (Cantharidae):

In addition to the records noted above, Peter Kirby took several saproxylic soldier beetles in 2013 in window traps or by sweeping close to the old willows and ash trees on the edges of the reedbeds on Adventurers' Fen (TL5569). *Malthinus balteatus* (26/06/2013, 08/07/2013), *Malthinus frontalis* (swept 26/06/2013), *Malthinus seriepunctatus* (16/07/2013), *Malthodes marginatus* (30/05/2013, 06/06/2013), *Malthodes minimus* (26/06/2013), *Malthodes pumilus* (window trap 08/07/2013, and swept at TL544695 on 06/06/2013).

Aerial interception traps:

These were used for the first ever time at Wicken, for three periods in 2013, with 3 traps placed by the trunks of old willows in St Edmunds Fen (TL564703) and they yielded some interesting species. Stuart Warrington ran the traps and Mark Telfer identified the beetles. Some highlights were *Malthinus frontalis* (19/07/2013), *Platycis minutus* (nationally scarce & new to Wicken, 02/09/2013), *Anthocomus fasciatus* (19/07/2013, 1st record since 1926), *Enicmus brevicornis* (nationally scarce, saproxylic & new, 25/09/2013), *Enicmus*

rugosus (nationally scarce, saproxylic & new), 02/09/2013), *Enicmus testaceus* (saproxylic & new, 02/09/2013), *Platystomos albinus* (nationally scarce, saproxylic & new), 19/07/2013), *Dienerella clathrata* (new, 25/09/2013), *Cis villosulus* (saproxylic & new, 25/09/2013), *Leptusa fumida* (new, 25/09/2013), *Opilo mollis* (new, 26/07/2013) and *Trixagus dermestoides* (1st for 80 years, 26/07/2013).

Bees (Hymenoptera): *Bombus ruderatus* (the Large Garden Bumblebee). A nice re-discovery, as it was last recorded 10 years ago, was this bumblebee species (a S41 priority species for conservation), when Peter Kirby netted two workers on 06/06/2013 in Adventurers' Fen TL549695.

Ants (Hymenoptera): discovered new to Wicken by Peter Kirby were *Formica fusca* (the 'Negro Ant') in pitfall traps in Adventurers' Fen TL549693 set 30/05 to 20/06/2013 in scrub-sheltered Phalaris-dominated vegetation; and *Lasius platythorax* in traps in Adventurers' Fen TL550694 set 20/06 to 08/07/2013 under willow canopy by a shaded shallow drain.

Harvestman (Opiliones): Two species new to Wicken Fen. *Dicranopalpus ramosus* by Mark Telfer, on tree trunks in two places in Adventurers' Fen TL555694 on 08/09/2013 and TL560700 on 02/09/2013. This species has amazingly long legs and rests in a characteristic manner (see photo below). It was also found by Ian Dawson in 2 different locations in 2014. Also found was *Oligolophus tridens* a common and widespread species, in Adventurers' Fen TL551695 on 30/10/2013 by Peter Kirby. This brings the site list up to 13 species, although 4 of these have not been recorded since before the 1930s.

Mollusca (Snails): *Merdigera obscura* the Lesser Bulin, a new land snail for the Wicken list. Found in Adventurers' Fen: Cmpt 51 (TL549693) in a pitfall trap run from 14 to 30/05/2013, in scrub-sheltered dense Phalaris-dominated vegetation, by Peter Kirby.

Moths: 2 new micro-moths.

Aethes beatricella (Tortricidae): new to Wicken Fen (TL5570), recorded by Kevin Button on 09/06/2014 and 17/06/2014, close to Lode Lane.

Cochylis dubitana (Tortricidae): new to Wicken Fen (TL5570), recorded by Kevin Button on 09/06/2014.



Merdigera obscura, the Lesser Bulin, a new land snail for Wicken's list.



Dicranopalpus ramosus, an amazing harvestman (photograph © Adrian Colston, taken in Devon)

Fungi:

The British Mycological Society held a conference in Cambridge in October 2013 and several people came on an excursion to Wicken Fen on 22/10/2013. Not surprisingly, several new species were discovered for the Wicken Fen list, including many common species such as:

Auricularia mesenterica ('tripe fungus'), *Bolbitius titubans* var. *titubans* (Yellow Fieldcap), *Byssomerulius corium* (Netted Crust), *Clavulina coralloides* (Crested Coral), *Coprinellus disseminatus* (Fairy Inkcap), *Coprinellus micaceus* (Glistening Inkcap) and *Galerina marginata* (Funeral Bell).

However, there were also some rare species discovered, such as *Hebeloma cavipes*, recorded by A. Henrici and confirmed by G.G. Kibby (only 2 sites on the NBN).

Wicken Fen species data on the NBN.

Is Wicken Fen the most species rich nature reserve in England?

On 23rd March 2015, we further updated our Wicken Fen dataset of the species records from the nature reserve on the NBN Gateway. There are now **97,695 records** (up 33% from the 73,514 records we put on the NBN in 2012) of **9,175 taxa** (species and subspecies), up 432 species (+ 5%) from 8,743 in 2012.

We are pretty confident that this makes Wicken Fen the most species rich nature reserve in England based on the data placed on the NBN. *Does anyone know differently?*

The earliest published records for wildlife at Wicken Fen are 1833 for a plant (the unusual Water Soldier), 1826 for an otter sighting and 1829 for a water beetle. We have a few hundred records in several years from 1878 until 1938 and then rather little data until 1966. A big increase in species recording came in the 1990s with a drive to get a high quality site list for the publication of 'The Checklist for Wicken Fen' by Friday and Harley (1999) (although 1996 was surprisingly poor with only 430 records). The biggest single years for records are the 10,543 in 2013, followed by 7,648 in 2012, 5426 in 2010 and 4,147 in 1998.

Not surprisingly for Wicken Fen the majority of the records with 78% of the data are for invertebrates, 70% are of insects and 27.8% are of moths (but do note that the bird data are actually a much higher proportion as we only send a sub-set of key data to the NBN).

Wicken Fen nature reserve species summary

Type of species	Number of species recorded at Wicken Fen	Examples
Mammals	30	Bats, Deer, Voles, Mice, Shrews, Otter.
Birds	233	77 regular breeding species, rest are occasional breeding, wintering & migrants.
Reptiles and Amphibians	7	Frog, toad, smooth newt, great crested newt, grass snake, slow-worm, common lizard.
Fish	24	Spiny Loach and Bitterling are rare.
Plants - vascular	440	Flowers, grasses, sedges, trees, ferns
Plants - mosses	133	Mosses and liverworts
Plants - algae	313	Stoneworts, diatoms, green algae
Fungi	590	Toadstools, bracket fungi, waxcaps.
Lichens	131	
Insect - flies	2018	Hoverflies, horseflies, soldierflies, snail-killing flies, assassin flies, houseflies, dung flies, picture-wing flies, midges.
Insect - moths	1220	Reed dagger and Silver-barred are two of the rarest.
Insect - butterflies	35	Brimstone, orange tip, gatekeeper, comma, peacock, ringlet.
Insect - beetles	1578	Reed beetles, ladybirds, rove beetles, ground beetles, dung beetles
Insect - bugs	377	Shieldbugs, pond skaters, water boatmen, aphids, plant hoppers
Insect - bees, wasps, ants	188	Bumble bees, solitary bees and wasps
Crustaceans	128	Woodlice, shrimps, water fleas
Molluscs	89	Snails, slugs, bivalves
Spiders	271	Spiders and harvestmen
Other insects and invertebrates	1370	Worms, nematodes, mites, springtails, rotifers, millipedes, centipedes, water bear, sawflies, mayflies, caddisflies, bristletails, lacewings, fleas ...
Total	9,175	Species and sub-species

More than 20 of the species from Wicken Fen that we have on the NBN Gateway are unique to this site, such as the fly *Megaselia wickenensis* and the nematode *Thornenema wickeni*, which were also both discovered new to science at Wicken. Some other examples of species unique to Wicken on the NBN are the aphids *Myzus lythri* and *Rhopalosiphum nymphaeae* (probably as aphids are such an under-recorded group), the two-tailed bristletail (Diplura) *Campodea lubbocki*, the 'house-fly' (Muscidae) *Polietes meridionalis*, the

flatworm (Turbellaria) *Mesostoma platycephalum*, 6 species of rotifer such as *Polyarthra remata* and at least 6 species of algae (e.g. *Euastrum insulare* and *Cosmarium ovale*).

NBN data, Wicken Fen and the National Trust

All of our Wicken Fen records can be viewed and downloaded via the NBN. You can find the Wicken dataset here: <https://data.nbn.org.uk/Reports/Sites/SB00000211088/Groups>

The Wicken dataset statistics are here: <https://data.nbn.org.uk/Datasets/GA000565>

All boundaries of National Trust properties have also been put on the NBN, from which you can access a great deal of our data as the NT's species data were uploaded in December 2014. Click here and use the zoom function or search facility. https://data.nbn.org.uk/Site_Datasets/SB000002

NBN data and feedback

We welcome feedback on our species data, such as new species, corrections and information on our older data that may need to be reviewed in the light of modern taxonomic or distribution information.

If anyone would like a full **list** of the Wicken records for a taxon group, such as Moths, Beetles, Vascular Plants, Flies etc. supplied as an **Excel** file, this is easily done. Just contact Stuart Warrington by email.

The Living Beauty of Wicken Fen

A superb article by Helen MacDonald in the New York Times Magazine (7th April 2015).

Helen Macdonald teaches at the University of Cambridge. Her most recent book, "H Is for Hawk," won the 2014 Samuel Johnson Prize and was the 2014 Costa Book of the Year.

http://www.nytimes.com/2015/04/12/magazine/the-living-beauty-of-wicken-fen.html?_r=2

The opening paragraph is:

On a foggy morning last spring, I took my brother and 11-year-old niece for a long walk in one of Britain's oldest nature reserves, Wicken Fen, a tiny fragment of a lost marshland ecosystem that once covered around 2,500 square miles of eastern England. We spent hours walking through a mosaic of grassland and sedge, past wet fields cut with scrub-shadow and flashes of open water. Everywhere was bursting with life: singing nightingales, snipe winnowing through the upper air, cuckoos tilting from the tips of willows and rails squealing and grunting in reeds. As we walked on wet grass by one of the fen's ancient waterways, a barn owl floated past us, its mothy wings shining through particulate mist; at our feet a drinker moth caterpillar inched furrily across the path like a cautiously mobile mustache. We knelt to watch its progress. Then my niece turned to me and asked: "When they made this place, where did they bring the animals from? Did they come from a zoo?"



Research

Ecosystem services research

KS-H Peh, A Balmford¹, RH Field, A Lamb, JC Birch, RB Bradbury, C Brown, SHM Butchart, M Lester, R Morrison, I Sedgwick, C Soan, A. Stattersfield, P. Stroh, RD Swetnam, DHL Thomas, M Walpole, S Warrington & FMR Hughes (2014)

Benefits and costs of ecological restoration: Rapid assessment of changing ecosystem service values at a U.K. wetland. *Ecology and Evolution* 4: 3875-3886.

This research was based entirely on a case study of Wicken Fen

Abstract

Restoration of degraded land is recognized by the international community as an important way of enhancing both biodiversity and ecosystem services, but more information is needed about its costs and benefits. In Cambridgeshire, U.K., a long-term initiative to convert drained, intensively farmed arable land to a wetland habitat mosaic is driven by a desire both to prevent biodiversity loss from the nationally important **Wicken Fen** National Nature Reserve and to increase the provision of ecosystem services. We evaluated the changes in ecosystem service delivery resulting from this land conversion, using a new Toolkit for Ecosystem Service Site-based Assessment (TESSA) to estimate biophysical and monetary values of ecosystem services provided by the restored wetland mosaic compared with the former arable land. Overall results suggest that restoration is associated with a net gain to society as a whole of \$199 ha⁻¹y⁻¹, (£130), for a one-off investment in restoration of \$2320 ha⁻¹. Restoration has led to an estimated loss of arable production of \$2040 ha⁻¹y⁻¹, but estimated gains of \$671 ha⁻¹y⁻¹ in nature-based recreation, \$120 ha⁻¹y⁻¹ from grazing, \$48 ha⁻¹y⁻¹ from flood protection, and a reduction in greenhouse gas (GHG) emissions worth an estimated \$72 ha⁻¹y⁻¹. Management costs have also declined by an estimated \$1325 ha⁻¹y⁻¹. Despite uncertainties associated with all measured values and the conservative assumptions used, we conclude that there was a substantial gain to society as a whole from this land-use conversion. The beneficiaries also changed from local arable farmers under arable production to graziers, countryside users from towns and villages, and the global community, under restoration. We emphasize that the values reported here are not necessarily transferable to other sites.

Download the full article for free from:

<http://onlinelibrary.wiley.com/doi/10.1002/ece3.1248/pdf>

Discussion (extract)

The data from 2011 showed that each hectare of restored wetland was worth £130 more than if it had remained in arable cultivation. The main service lost after restoration is arable production. We omitted several services that are likely to be provided by restored wetland because we could not measure them. Perhaps most importantly and related to the original aims of the Wicken Fen Vision, we did not measure the enhancement of the wildlife value of the restoration land and its potential to buffer and make more viable the populations of rare species that occupy Wicken Fen NNR.

Additionally, when arable land is converted to wetland, inputs of agrochemicals into surface waters and ground water (as well as greenhouse gas emissions from applying them) are reduced. Changes to water quality were not measured because no suitable inflow or outflow sites were present at which comparative measurements could be made. Ecological restoration can also lead to soil quality improvements, but we were unable to evaluate these. Also, our study did not include all of the costs associated with agricultural drainage and pumping of water into rivers.

More generally, we hope that our approach for rapidly evaluating a broad range of services under contrasting land uses can be used to identify those of greatest benefit to society as a whole, and hence to inform a wider debate about the purpose and scope of publicly funded incentives to landowners.

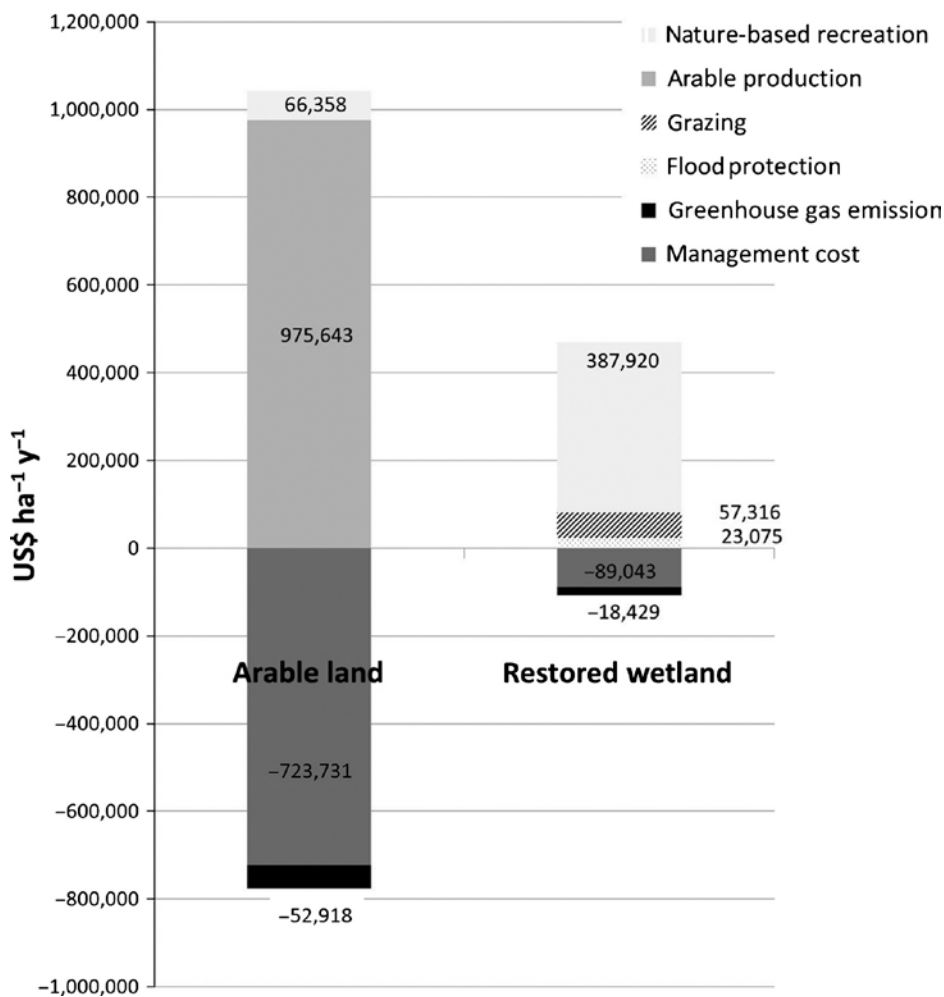


Figure 1. A comparison of the ecosystem service values and management costs in 2011 (in US \$ for 479 ha/year) of restored wetland and of the same land if returned to arable agriculture.

Press release extract: Dr Francine Hughes, Reader in Animal and Environmental Biology at Anglia Ruskin University, said:

“Our study at the Wicken Fen Vision project gives us evidence that restoration of wetland habitats not only helps wildlife but also provides benefits for many people both locally and further afield. Under arable production, a small number of landowners and their employees gain the majority of the benefits. Under restoration a much broader range of people benefit, including many more visitors as well as the global community through reduced greenhouse gas emissions. Yet many of these benefits do not accrue to the landowner who is therefore encouraged to continue undertaking arable production rather than considering the possibilities of restoration. More generally, we hope that our approach for rapidly evaluating a broad range of services under contrasting land uses can inform a wider debate about the purpose and scope of publicly funded incentives, such as carbon payments, to landowners.”



Some preliminary results from Sedge Fen eddy covariance station: Energy and water fluxes

Jörg Kaduk, Department of Geography, University of Leicester, jk61@le.ac.uk

The following data result from a **preliminary** analysis of the Eddy Covariance (EC) data from Wicken Sedge Fen for the 12 months from 1 July 2013 to 30 June 2014 focussing on energy and water fluxes.

Results

Environmental conditions

The second half of 2013 was relatively warm with a mild autumn (Figure 1). Spring 2014 was cooler than autumn 2013. Annual precipitation amounted to 470mm yr^{-1} for the time period considered here. Water table dropped from the beginning of the period considerably to a maximum depth of 0.8m below the ground in September and October. During November and December the water table recovered and stayed close to or above the surface until the end of June 2014.

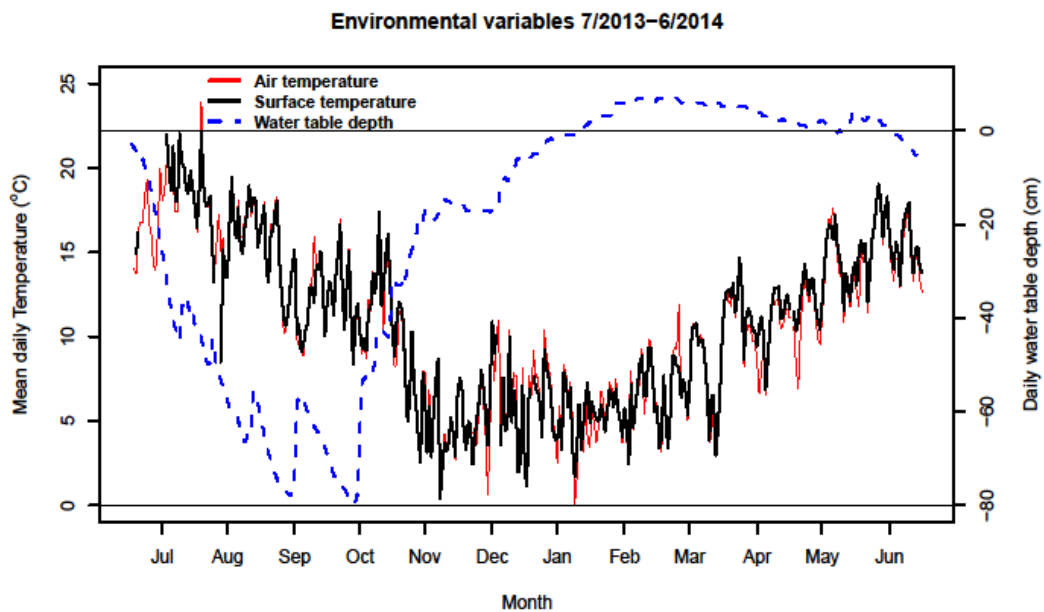


Figure 1. Air temperature (red line), surface temperature determined from the upwell longwave radiation (black line) and water table depth (dashed blue line, RH axis).

Evapotranspiration

Annual evapotranspiration for the time period July 2013 to June 2014 amounted to 727 mm yr^{-1} . Evapotranspiration was larger in the second half of 2013 than in the first half of 2014 (2) as expected from the temperatures in 2013/14 (Figure 1).

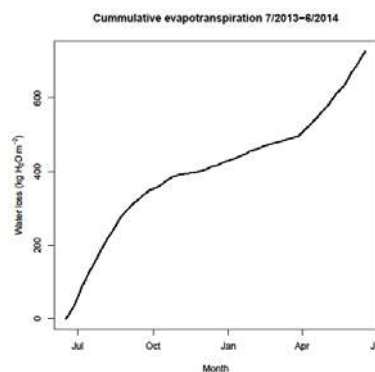


Figure 2. Cumulative evapotranspiration July 2013 to June 2014 determined from the gap filled LE fluxes.

Discussion

Energy balance

The energy balance closure is a measure of how well the EC system captures the different energy fluxes. Also, since it compares the measurements resulting from the H₂O/CO₂ infrared gas analyser including the full Eddy covariance data processing and QC with in principle much simpler and error prone measurements, R_n and G, (Twine et al., 2000) the energy balance closure is a limited check on the quality of the calculated fluxes. The energy balance closure from the equipment suggested a good overall system performance. Some underestimation of the partitioning of the net radiation could result from the warming of the top soil layer above the heat flux plates or warming of the canopy air which might not be captured by the instruments above.

Water fluxes

Annual potential evapotranspiration for Wicken Fen is given at 594 mm yr⁻¹ (McCartney & de la Hera, 2004) and precipitation measured at our other EC station was only 470 mm yr⁻¹. This is much lower than the here measured annual evapotranspiration of 727 mm yr⁻¹. However, much lower values are not supported by the energy balance closure achieved here. Average rainfall for East Anglia for the period was 676 mm yr⁻¹ and the long term means (1981-2010) from the two nearest weather stations are 574 and 632 mm yr⁻¹. This suggests that our measurement is an underestimate and precipitation input was in fact at least 600mm yr⁻¹. Additionally, the NT installed a wind mill to pump minerotrophic water onto the fen in 2009 and there is some indication for a small inflow from the lode to the Fen (McCartney and de la Hera, 2004). Overall there seemed to have been enough water input to support the measured annual evapotranspiration and allow the water table to return to within 5mm of the level beginning of July 2013.

Furthermore estimates of potential evapotranspiration contain come uncertainties regarding assumptions about the resistance used and there are different studies showing that evapotranspiration from reed (*Phragmites*) and wet sedge vegetation can be 10-20% higher than indicated by the potential evapotranspiration. Assuming a 12 and 13% higher evapotranspiration for Summer and Winter respectively than the potential, this suggests an annual evapotranspiration of 669 mm based on monthly potential evapotranspiration for Wicken Fen. Additionally, there are indications that annual potential evapotranspiration for the Wicken Fen area has been increasing over the last decades (McCartney & de la Hera, 2004). Considering the latter and that there was a warm spell in the second half of 2013 the first half of 2014 cool compared to long term climate suggests that the measured seasonal change and annual total compare well with other estimates of evapotranspiration.

McCartney, M. P., and de la Hera, A (2004) Hydrological assessment for wetland conservation at Wicken Fen. *Wetlands Ecology and Management*, **12**: 189-204

Recent publications in addition to Peh et al (2014).

Panter C.J., Dolman P.M., Mossman, H.L (2013) *Predictive modelling of spatial biodiversity data to support ecological network mapping: a case study in the Fens*. University of East Anglia, Norwich.
<http://www.fensforthefuture.org.uk/admin/resources/5fensbiodiversityauditfinalreport24-10-2012.pdf>

Peh, K.S-H. (2013) TESSA: A toolkit for rapid assessment of ecosystem services at sites of biodiversity conservation importance. *Ecosystem Services* **5**: e51–e57 [Wicken is a case study]

Rotherham, I.D. (2013) *The Lost Fens: England's greatest ecological disaster*. The History Press. [Wicken is mentioned many times]

Sills, N. (2013) Marsh Carpet moth larvae at Wicken Fen. *Nature in Cambridgeshire* **55**: 37-43.

Thorogood, R. & Davies, N.B. (2013) Reed warblers fine-tune their defences to track three decades of cuckoo decline. *Evolution* **67-12**: 3545–3555.

Wilson, D. (2014) *Cimbex luteus* (L.) (Symph.: Cimbricidae) at Wicken Fen. *Entomologists' Record and Journal of Variation*, **126**: 115-116 [refers to a 1974 record]

Recent research projects at Wicken Fen.

Carys Breeze (2014) The successional development of Diptera community on decomposing flesh – using multivariate modelling to predict duration of environmental exposure. Thesis, University of Newcastle, Biology Department.

Traps were set up at Wicken Fen (Evan's Fen) to catch blowfly species on progressively aged meat baits. 40 Diptera (fly) species were identified that had been attracted to these meat baits. Analysis showed that there were several explanatory variables that impact on the blowfly species that are found on a carcass: 1) the type of habitat in which the carcass is placed, 2) the age of the carcass, and 3) the plant species and moisture levels of the surrounding area.

Gez Noyce (2014) Biotic and abiotic factors affecting the abundance of the species *Argyroneta aquatica* (Araneae, Cybaeidae) at Wicken Fen National Nature Reserve. MSc Thesis, Imperial College University London, Taxonomy and Biodiversity.

This research looked at biotic and abiotic factors and variables which may influence *Argyroneta aquatica* (water spider) distribution at Wicken Fen. This species was regularly found in the ditches across the old fen, but was almost absent from the more recently restored sites. Plant density was found to be the most influencing factor among the data, explaining 57.9% of the variance for the distribution of *A. aquatica* with a positive correlation value of +0.761.

Carrying out a Research Project at Wicken Fen

If you wish to carry out research at Wicken Fen, you will need to have the support of the Wicken Research and Recording Group and you must get a permit.

For research proposals, please ask for the form: email: wfresearch@nationaltrust.org.uk

The R&R Group will consider the research proposal and get back to you as soon as we can. We like to have the site used for research (there have been 24 students projects (BSc, MSc, PhD) at Wicken in the last 6 years). However, we do need to co-ordinate and manage the research work. We also have ideas for useful projects and can guide you to good sites on the property, provide maps etc. We have risk assessments available if you wish to work on areas where we have grazing animals.



The fen flux equipment in Baker's Fen.

Recording species at Wicken Fen

Please do come to Wicken Fen to observe and record its flora and fauna. Don't assume that because the site has such a long history of recording that nothing new or unusual can be found. This Newsletter has highlighted a number of species found new to the property or the first record for many decades. Also, the Reserve is getting larger and it is very interesting to find out what species occur on the restoration land, so do look at the new land as well as the classic fen.

We can send you a Map of the site too, to help you get around and find the new areas of habitat to survey.

Please get a Permit

You will need a permit to use a trap, net or collect specimens, but these are readily obtained, with the understanding that you will send us your records. To get a Recording Permit, email (or write) with your address and what you want to do study (eg 'Moth trapping', 'collect Coleoptera and Hemiptera using a sweep net'), to either:

Karen Staines, Administrator, Wicken Fen. Address and telephone number on p1.

Email Karen.staines@nationaltrust.org.uk or Email stuart.warrington@nationaltrust.org.uk

Sending in your Records

The key information we need is:

Species Name, Location, OS Grid Ref., Date, Recorder.

It is also useful to add Comments (exactly where found, the habitat, notes on the behaviour etc.), Determiner (if different to the recorder) and Abundance (how many). The ideal Format for us is an Excel Spreadsheet, with each individual record on a separate line, with separate columns for Species Name, Location, Grid Ref., Date, etc. This can then be emailed to wickenfen@nationaltrust.org.uk or to stuart.warrington@nationaltrust.org.uk

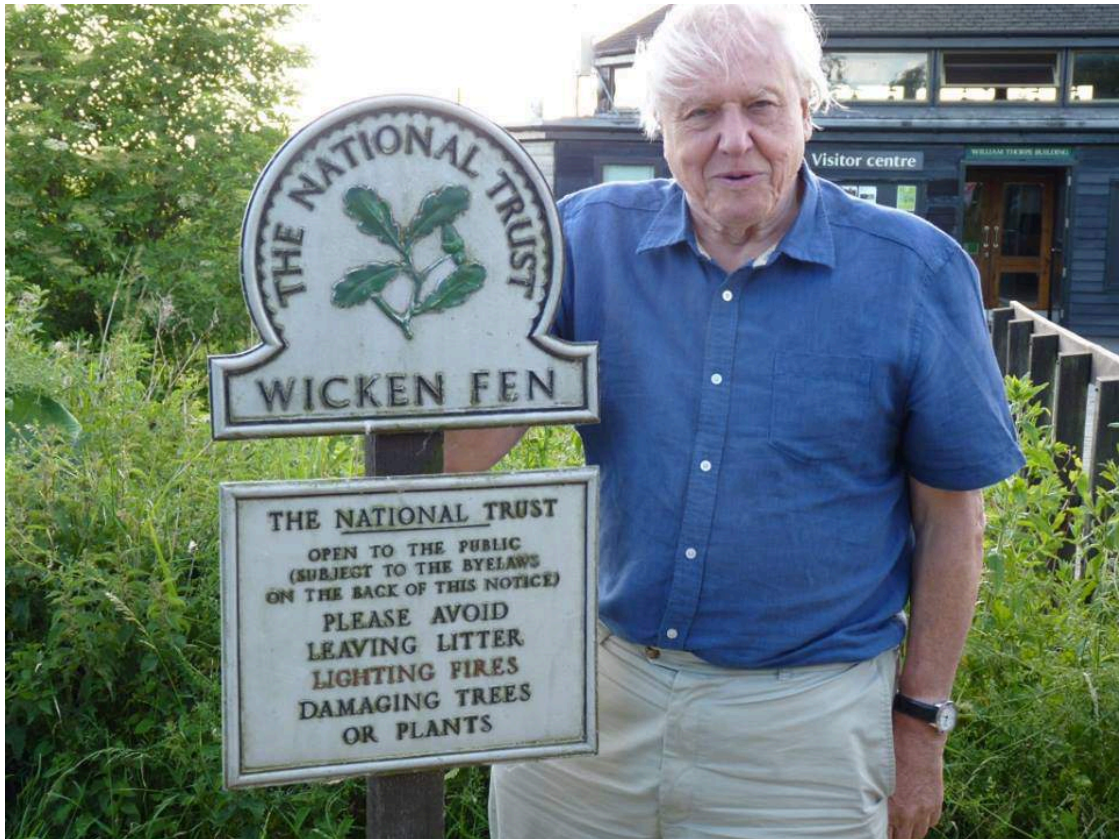
If you don't have access to email and computers, than a typed or hand-written list is perfectly acceptable.

With Moth records, it is very useful if the Bradley Checklist Code number can be included.

Small Copper	Compartment 22	TL562706	15/07/2005	John Smith	Basking on path	4
Gatekeeper	Sedge Fen Drove	TL556706	15/07/2005	John Smith	15 over 100 metres	15
Speckled Wood	St Edmunds Fen	TL564702	15/07/2005	J.B. Jones	A few noted	
Peacock	Burwell Fen: Cmpt 208	TL563689	15/07/2005	J.B. Jones	5 around thistles	5

1634	Lackey	Sedge Fen Drove	TL556706	10/06/2006	C.C. Brown	5
1640	Drinker	Sedge Fen Drove	TL556706	10/06/2006	C.C. Brown	1
1713	Riband Wave	Sedge Fen Drove	TL556706	10/06/2006	C.C. Brown	1
926	Phalonia maniana	St Edmunds Fen	TL564702	11/06/2006	C.C. Brown	1





David Attenborough visited Wicken Fen in July 2014



The arrival of the Tansy Beetles made the local television news, September 2014.