

Pond Survey of Bedfordshire 1991

A report to Bedfordshire County Council

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Introduction

The Bedfordshire Landscape and Wildlife Review 1979 included information on the number and condition of ponds in the county based on a sample survey. The purpose of the present survey was to update this information with reference to 1991 aerial photographs.

Methodology

The 44km² sample grid squares originally identified in the 1976 survey were used, providing a 4% sample of the county (Figure 1) and the following definition provided by Pond Action (Oxford Polytechnic) was followed throughout the survey:

A pond is a small water body, seasonal or permanent, between 0.0001 ha (i.e. 1m x 1m) and 2ha in area. Water is usually present for at least 6 months of the year during which time it may be of any depth.

The original three category classification of ponds, 'Remaining', 'Overgrown' and 'Lost' has been retained with the addition of a further category to include 'New' ponds. As in the original 1976 survey, woodland ponds, garden ponds, flooded pits, effluent lagoons, moated sites and parkland lakes have been excluded. However, changes in boundaries and land use over the 16 year period between surveys have brought some of the originally recorded ponds into categories initially excluded in the original survey. For the purposes of this study, ponds recorded in 1976 have been included despite these changes.

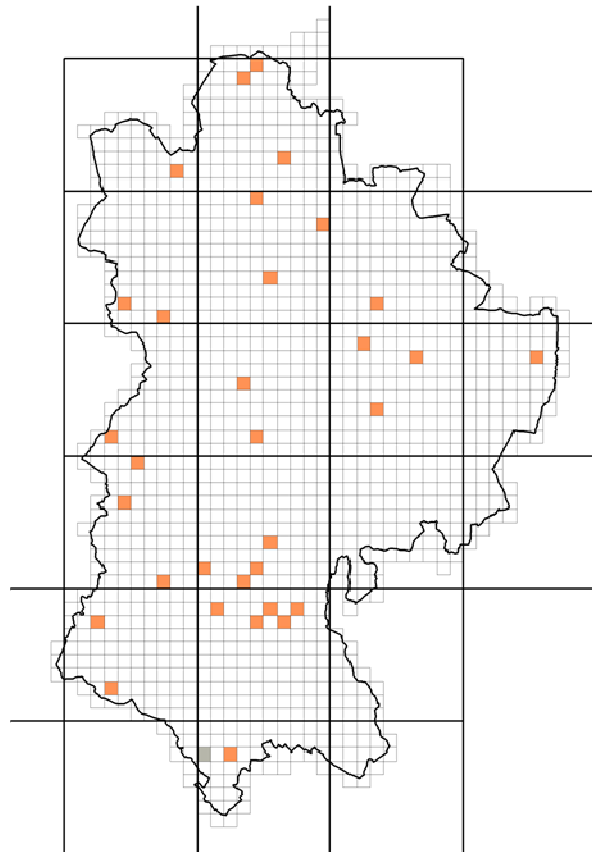


Figure 1 1km² grid squares included in the 1976 and 1991 Bedfordshire pond surveys. The grey square represents Whipsnade Park Zoo. Sample squares without ponds are not represented.

Earlier Survey Work

Identification of pond sites required checking the original locations using the OS (1984) Edition, with reference to the OS 2nd Edition (1902) for historical accuracy and continuity. It was by this process that a number of omissions in the 1976 survey became apparent and were confirmed by reference to the original 1976 aerial photographs. Any omitted ponds so located were included in the survey and were further confirmed by site investigation; where the site's existence was confirmed and its condition recorded. Phantom ponds (recorded but non-existent) and double plots were also corrected as necessary.

Whipsnade Park Zoo

An anomaly (shaded in grey in Figure 1) within the survey has been the inclusion of Whipsnade Park Zoo as a site square from the original 1976 survey, as inclusion skews the data through the presence of numerous water features. Although the park is the site of an ancient pond and three newly restored wildlife dipping ponds and several duck ponds, it also

contains giraffe drinking ponds, flamingo ponds and several rhino wallows, which although could be considered ponds, due to their use by exotic species and for the purposes of this survey are not; data have therefore been recorded separately (Table 1).

Results

The original results of the 1976 survey indicated an 82% rate of loss relative to the number of ponds present in 1902. This figure has been shown to be incorrect with a re-evaluation of the 1976 survey resulting in the identification of a further 43 ponds. The original error was further compounded by the combination of two separate categories to provide an inflated figure. Table 1 shows the results of both the original and more recent survey.

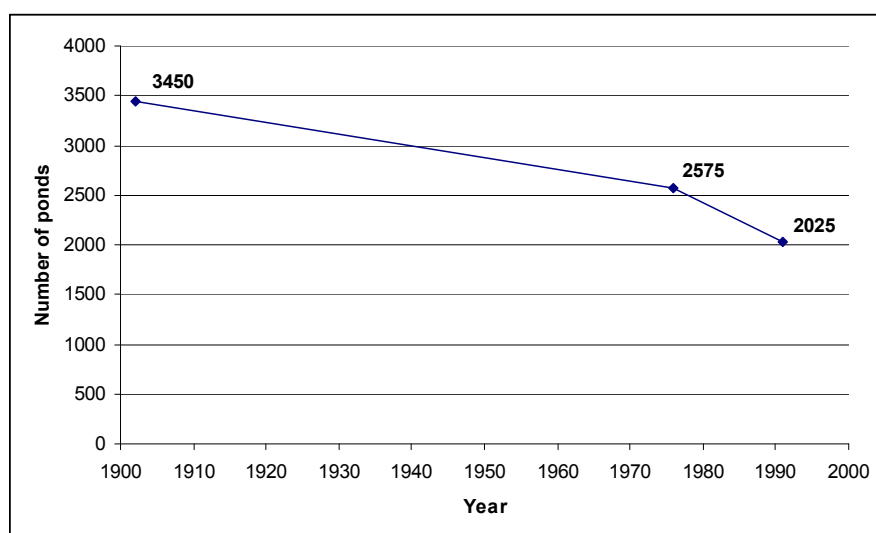
Table 1 Comparison of overall results from the 1976 and 1991 Bedfordshire pond surveys

	1976 (original)	1976 (revised)	1991
Km ² sampled	44	44	44
Km ² with ponds	25	33	32
Total number of ponds	95	138	103 (115)
Ponds removed	38	38	22
Ponds overgrown	40	38	46 (47)
Ponds retained	17	62	35 (49)
New ponds	-	-	4
Rate of loss	82%	27.5%	21% (20.5% including new ponds)

(Figures including Whipsnade Park Zoo in brackets)

Based on the revised data, of 138 ponds present in 1902, 38 had been lost by 1976, a rate of loss of 27.5%. Countywide this would approximate to the loss of 943.5 ponds within the 74 year survey of 12.75 ponds per year (Figure 2).

Figure 2 Change in the number of ponds in Bedfordshire, from 1902 to 1991



Of the remaining 103 sites in 1976, a further 22 had been lost by 1991, a rate of loss of 21% equivalent to 36.6 ponds per year countywide, indicative that the rate at which Bedfordshire's ponds are disappearing is increasing. This loss is not being offset by the creation of new ponds of which in 1991 4 were recorded (lowering the rate of loss to 20.5%) or re-emergent ponds (ponds lost or removed that reappear in later years) of which 3 were recorded in 1991 equating to a rate of pond creation of 3.8% and re-emergence of 3.0%.

Not only has the number of ponds declined in the past 15 years, but also the condition of the surviving ponds has deteriorated. In 1976, of the 100 existing ponds, 38% were in an overgrown condition, 62% open and accessible; by 1991 the situation had almost reversed. Of the 103 ponds recorded in 1991, 57% were overgrown and 43% open and accessible.

Trends

Underlying this observation are the significant changes that have taken place between categories. Between 1976 and 1991 33 (24%) ponds have changed category in a downwards direction, either from an open pond to an overgrown one, or from being overgrown to being lost. Only 7 (5%) ponds have changed category in an upward direction, five of these due to miscategorisation in the 1976 survey. The overall shift is indicative of the downward trend in the condition of the county's ponds, the condition of the remaining ponds making them vulnerable to further degradation and of less value either as landscape features or wildlife habitat.

Locational characteristics

In terms of location, agricultural land remains the single largest category, containing 56.4% of all ponds recorded in 1991. It has also experienced the greatest loss, 68.2% of all ponds lost since 1976 being originally located there. 23.5% of the remaining ponds are currently located within village boundaries, 2.3% on roadsides and 17.16% in other locations. Losses amount to 22.7%, 4.5% and 4.5% respectively in these areas.

Condition of ponds

It is of note that proportionately agricultural ponds are in a poorer condition than their counterparts elsewhere. 56.2% of agricultural ponds can be listed as being in good condition that is open and accessible, while the figure is 58.3% for village ponds and 71.4% for ponds in other areas. This is exacerbated by 6.25% of agricultural ponds being in a very poor state, densely overgrown and inaccessible, while none of the other categories contain ponds in this condition.

Implications

So the value then of non-agricultural ponds in villages and other areas can be seen to be of increasing importance as the number and physical condition of agricultural ponds declines. This may also be the case in terms of chemical pollutants from agricultural activity as although chemical analysis was not carried out for this survey, films of oil and dense algal mats were observed in some ponds. There are however particular implications for those plants and animals with specialised requirements and those susceptible to disturbance by human activity. As pond habitats away from settlement areas become fewer and poorer in quality, and the distance between ponds increases the reproductive strategy of some species may also suffer.

Current project areas with the county such as the Marston Vale offer an opportunity for further analysis on a regional basis and extending the information contained within this

survey to include the physical and biological condition of both established and newly created ponds and their current usage, information not included in this survey.

Re-interpretation of Table 1 data

Table 1 in the 1991 report was inconsistent in the way the Whipsnade WAP site (no. 43) was included, and the way new ponds were counted. Also one pond (site 4, pond 7) was declared not to be a pond in the 1991 revision. Site 4, pond 9 was ambiguously marked as being both overgrown and lost, with a comment of being silted-up in woodland.

For consistency then, the following revised numbers *exclude*:

- Site 43 (Whipsnade WAP)
- New ponds
- Site 4, pond 7

And assume Site 4, pond 9 was lost.

(The 1991 removed, overgrown and retained numbers are with respect to the ponds that were in existence in 1976, i.e. 22 ponds were lost between 1976 and 1991)

	1976 (revised 2007)	1991 revised
Km ² sampled	43	? ¹
Km ² with ponds	32	30 ²
Total number of ponds	138	103 ³
Ponds removed	38	22
Ponds overgrown	39 ⁴	46 ³
Ponds retained	61 ⁴	35 ³

If new ponds are considered then the following are the revised numbers:

	1976 (revised 2007)	1991 revised
Km ² sampled	43	?
Km ² with ponds	32	31
Total number of ponds	138	107
Ponds removed	38	22
Ponds overgrown	39	46
Ponds retained	61	34
New ponds		4

Keith Balmer – 12/04/2007

¹ Unclear if the 11 other 1km squares were reviewed in 1991. The list of these squares is lost.

² Value of 32 in 1991 report appeared to include the effect of new ponds (and the Whipsnade site).

³ Includes 3 ponds that came back from the grave!

⁴ Mis-totalled in 1991 report