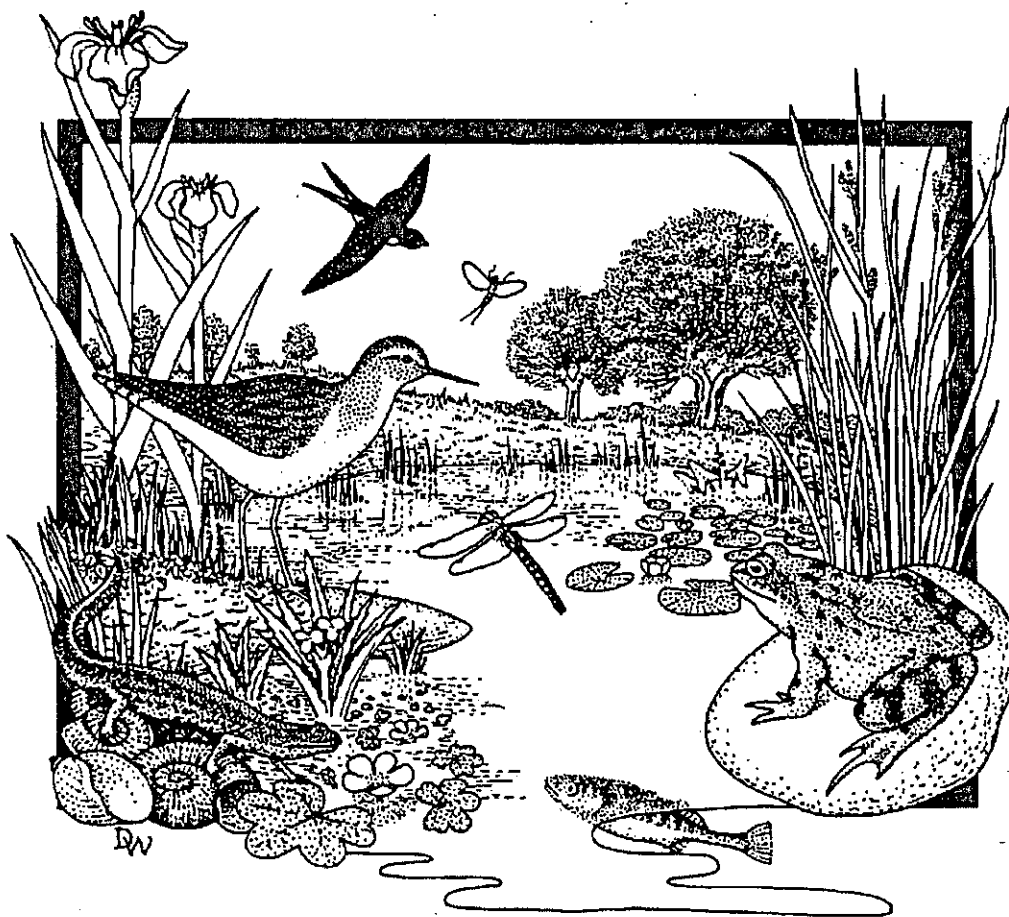


## Ecological Survey of Warden Law



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*Report produced for:*  
Ponds for People

# ECOLOGICAL SURVEY OF WARDEN LAW

## 1. Aims and objectives

This report describes the results of a plant survey undertaken by Pond Action at Warden Law (Grid reference NZ371504), north-west of Houghton le-Spring (near Durham). Of the four pools present on the site, the upper (north-west) pond was chosen for detailed survey work. Additional plant species were also noted during brief surveys of the other ponds.

The work was commissioned by The Ponds Conservation Trust in order to give information about the ecological value of the site and to help provide the basis for decisions about its future management.

The current study forms part of The Ponds Conservation Trust's (PCT) 'Ponds for People' project. The first phase of this project is currently running in the NE of England as a collaborative venture between the PCT, the Environment Agency, local authorities, water companies and local community groups. The project's overall objective is to help deliver local Biodiversity Action Plan objectives with respect to ponds.

## 2. Methods

The site was surveyed for wetland plants, by Penny Williams, on 28<sup>th</sup> September 2000. Note that the survey was carried out relatively late in the year, and that additional species, particularly aquatic plants such as stoneworts, water-buttercups and pondweed species, may have been present at the site earlier in the season.

The method used for the assessment was based on a standard technique developed for the National Pond Survey.

Wetland plants<sup>1</sup> were surveyed by walking and wading the perimeter and open water areas less than 1 m deep noting the species present.

The pond's conservation value was assessed in terms of:

- (i) the number of species of plants recorded,
- (ii) the number of uncommon plant species found.

Plant data from the site were compared with information from other UK sites that have been surveyed using the same methodology (see Appendix 2).

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<sup>1</sup>The term 'wetland plant species' refers to species defined as wetland plants on the National Pond Survey field recording sheet list. Terrestrial plant species are not recorded.

### 3. Plant survey results

The survey pond at Warden Law supported a good plant assemblage with a total of 17 wetland plant species recorded during the current survey (see Appendix 1). This is a little below the average number of wetland plant species recorded in high quality, unpolluted ponds protected from human impacts (average number of wetland species in unpolluted ponds = 23; (see Appendix 2).

None of the species recorded from Warden Law were rare or Nationally Scarce plants. However two of the species noted can be considered to be "local" at a national level, in that they have been recorded in less than about a quarter of all 10 x 10 km squares in Britain. These species are listed in Table 1. Both were aquatic plants and both were recorded from pools in the south-west corner of the site. In addition the stonewort *Chara vulgaris* var. *papillata* was recorded. Although not an uncommon stonewort species nationally, this is the first time that this variety has been recorded from Northumberland (N. Stewart *pers. comm.*).

The pond as a whole was dominated by extensive stands of Common Spike-rush (*Eleocharis palustris*) which filled over 85% of the water area. However, a number of small pools remained open within the spike-rush. The largest of these, which occurred in the south-west corner between the two arms of the pond, supported extensive stands of Common Stonewort (*Chara vulgaris* var. *papillata*) and occasional plants of a water-crowfoot (probably *Ranunculus trichophyllus*). Other small openings in the spike-rush, particularly along the northern arm of the pond, supported stands of Small Pondweed (*Potamogeton berchtoldii*), Fennel Pondweed (*Potamogeton pectinatus*) and Broad-leaved Pondweed (*Potamogeton natans*).

Above the waterline, the pond's drawdown area was dominated by Creeping Bent (*Agrostis stolonifera*) and Common Spike-rush together with occasional wetland herbs particularly: Tufted Forget-me-not (*Myosotis laxa*), Lesser Spearwort (*Ranunculus flammula*), Great Willowherb (*Epilobium hirsutum*), and Marsh Speedwell (*Veronica scutellata*).

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**Table 1. Uncommon plant species recorded from the main survey pond**

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Plant species	English name	Status
<i>Potamogeton berchtoldii</i>	Small Pondweed	Local
<i>Ranunculus trichophyllus</i>	Thread-leaved Water-crowfoot	Local

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## Other ponds

Other pools on the site supported interesting species including the local aquatic plant Lesser Marshwort (*Apium inundatum*) which was locally common in shallow water and in the drawdown zone of both of the lower ponds. The most westerly of the lower ponds also supported good stands of two charophyte species, *Chara vulgaris* var. *papillata* and *Chara virgata*. This is the first record for *C. virgata* in Northumberland (N. Stewart *pers. comm.*).

The larger and most easterly of the lower ponds supported extensive stands of the local species Greater Spearwort (*Ranunculus lingua*), but this was almost certainly deliberately planted up at the site.

## 4. Discussion

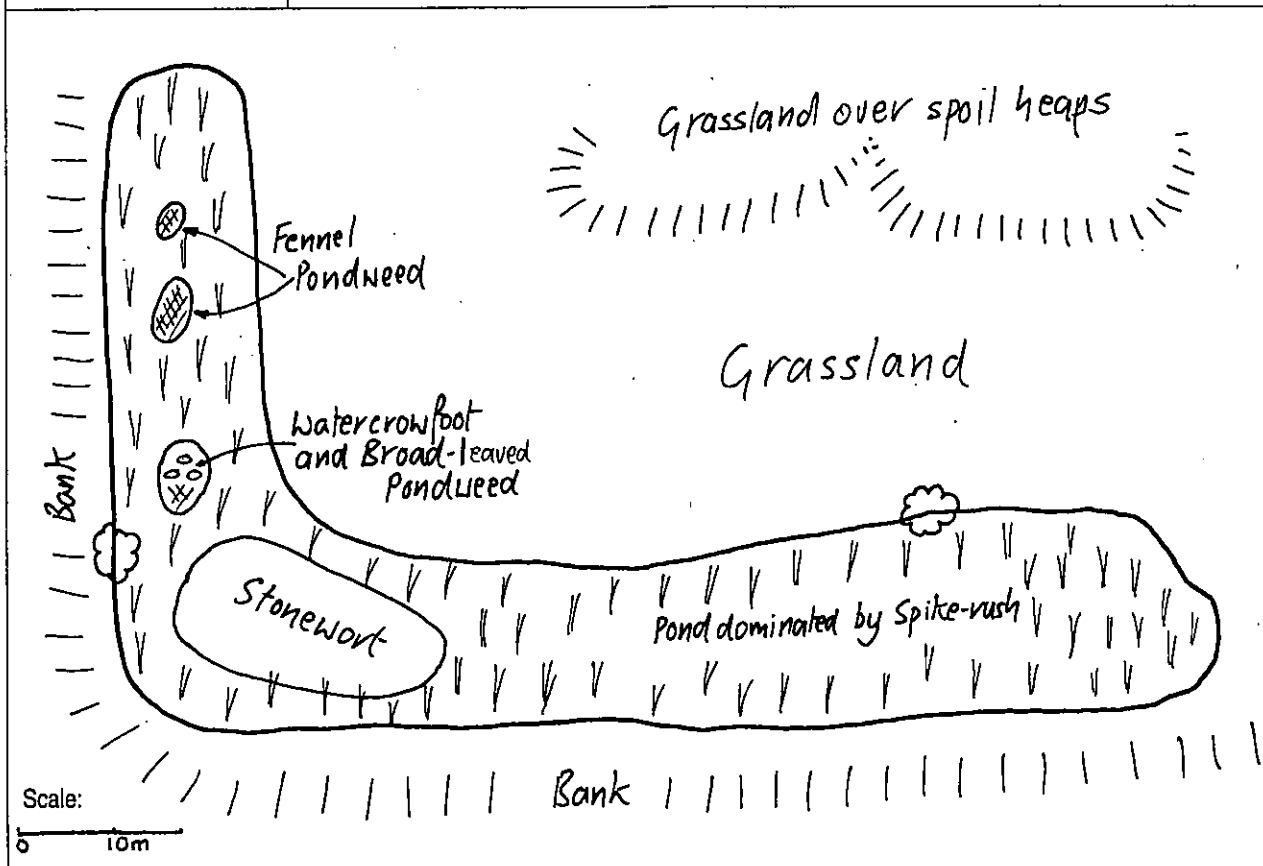
The site as a whole supported an interesting mix of wetland species characteristic of different water chemistries. This included both eutrophic species such as Fennel Pondweed and more acid-loving oligotrophic and mesotrophic species such as Lesser Marshwort and Marsh Speedwell. The site, which is only about five miles from the coast, also exhibited a maritime influence through the presence of species such as Brookweed (*Samolus valerandi*).

It was clear from the survey that the open pools remaining in the spike-rush area were valuable for aquatic plant species. In order to protect and enhance these areas for both aquatic plants and for great crested newts which are known to be present on the site, it would be valuable if these pools were maintained, and a few additional open pools created by clearing out areas of spike-rush (perhaps 3 - 4 metres diameter). Ideally these should be located away from the northern tip of the site which probably receives relatively poor quality water from the hillside above.

It would be worth ensuring that the Bulrush (*Typha latifolia*) growing in the main survey pond does not spread too much and begin to out-compete the spike-rush.

## Warden Law site details

<b>Location</b>	Grid reference: NZ 371 504. North of the village of Warden Law. North-west of Houghton le-Spring, near Durham.
<b>Date of visit</b>	28 <sup>th</sup> September 2000.
<b>Description</b>	The site comprises a complex of four terraced ponds of varying size and permanence located in an old quarry. The ponds also act as balancing ponds for water draining from the hillside above. Of the four ponds, the upper (north-west) pond was chosen for more detailed botanical survey work.
<b>Surrounds</b>	The ponds are surrounded by acid grassland with arable land below the pool area and made-over ground (= old waste tip?) and a motor-cross track above.
<b>Pond area</b>	The survey pond was c 0.25 ha in area; other pools varied from approximately 0.1 ha to 2.7 ha.
<b>Shade</b>	All ponds were almost completely unshaded.
<b>Depth and permanence</b>	The ponds varied in depth and permanence. The two upper ponds were both seasonal sites. The two lower ponds were probably permanent, with the lowest having maximum water depths of 80 cm and maximum silt depths of 50 cm.
<b>Water clarity</b>	All the ponds had clear water.
<b>Water source</b>	All ponds were fed by surface water draining from the surrounds and/or other ponds.
<b>Impacts</b>	The upper ponds, in particular, will receive some silt and accompanying pollutants in water draining from the bare hillside above.
<b>Invertebrate habitats</b>	All the ponds were well vegetated with abundant underwater habitat provided by emergent, and sometimes submerged, plant stands.



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## Appendix 1a. Plant species recorded

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Plant species	English name	Status
Submerged plants:		
<i>Chara vulgaris</i>	Common Stonewort	Frequent
<i>Potamogeton berchtoldii</i>	Small Pondweed	Local
<i>Potamogeton pectinatus</i>	Fennel Pondweed	Common
<i>Ranunculus trichophyllus</i>	Thread-leaved Water-crowfoot	Local
Floating-leaved plants:		
<i>Potamogeton natans</i>	Broad-leaved Pondweed	Common
Emergent plants:		
<i>Agrostis stolonifera</i>	Creeping Bent	Common
<i>Cardamine pratensis</i>	Cuckooflower	Common
<i>Deschampsia cespitosa</i>	Tufted Hair-grass	Common
<i>Eleocharis palustris</i>	Common Spike-rush	Common
<i>Epilobium hirsutum</i>	Great Willowherb	Common
<i>Epilobium parviflorum</i>	Hoary Willowherb	Common
<i>Equisetum palustre</i>	Marsh Horsetail	Common
<i>Juncus articulatus</i>	Jointed Rush	Common
<i>Juncus inflexus</i>	Hard Rush	Common
<i>Myosotis laxa</i>	Tufted Forget-me-not	Common
<i>Ranunculus flammula</i>	Lesser Spearwort	Common
<i>Ranunculus lingua</i>	Greater Spearwort	Native but introduced to the site
<i>Typha latifolia</i>	Bulrush	Common
<i>Veronica scutellata</i>	Marsh Speedwell	Common
<b>Number of Submerged species</b>	<b>4</b>	
<b>Number of Floating species</b>	<b>1</b>	
<b>Number of Emergent species</b>	<b>12</b>	
<b>Total number of species</b>	<b>17</b>	

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## Appendix 1b. Additional plant species recorded from other waterbodies on the site

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Plant species	English name	Status
<i>Apium inundatum</i>	Lesser Marshwort	Local
<i>Elodea nuttallii</i>	Nuttall's Waterweed	Introduced
<i>Carex rostrata</i>	Bottle Sedge	Common
<i>Juncus effusus</i>	Soft Rush	Common
<i>Samolus valerandi</i>	Brookweed	Local
<i>Chara globularis</i>	Fragile stonewort	Frequent
<i>Chara vulgaris</i>	Common Stonewort	Frequent

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## Appendix 2. Comparative data for assessing pond conservation value

The following information gives a range of data about the conservation value of ponds in Britain. This information indicates the *typical* plant species richness of UK ponds based on standard surveys using National Pond Survey methods.

Note that National Pond Survey sites indicate the standard that ponds *should* reach in Britain when they are not exposed to damaging human impacts (e.g. water pollution, intensive land management, overstocking with fish, artificial feeding of waterfowl). The two wider countryside surveys show the typical state of ponds in the "ordinary countryside" where ponds are often exposed to a variety of factors which reduce their conservation value.

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**Appendix Table 1. Number of plant species recorded from UK ponds**

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		<i>Number of species:</i>		
		<i>Marginal plants</i>	<i>Aquatic plants</i>	<i>Total plants</i>
<b>National Pond Survey</b> (high quality ponds mostly protected from pollution)	<i>Average</i>	18	5	<b>23</b>
	<i>Range</i>	(1-42)	(0-14)	(1-46)
<b>Wider countryside ponds</b> (DETR Lowland Pond Survey 1996)	<i>Average</i>	8.0	2	<b>10</b>
	<i>Range</i>	(0-30)	(0-10)	(0-35)
<b>Wider countryside ponds</b> (ROPA Survey*)	<i>Average</i>	11	3	<b>14</b>
	<i>Range</i>	(1-32)	(0-11)	(1-38)

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\*The ROPA survey was undertaken by Pond Action with funding from the Natural Environment Research Council.