



# eDNA Survey

Petersfield Heath

January 2019

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# eDNA Survey

## Petersfield Heath, Hampshire

January 2019

South Downs National Park Authority

Western Downs Area Office

Empshott

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# Contents

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1.	Introduction.....	2
2.	Methodology.....	3
3.	Baseline Conditions .....	5
4.	Results .....	6
5.	Conclusions and Recommendations.....	7

Appendix A – Survey map

Appendix B – Legislation

# Non-technical Summary

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This Environmental DNA (eDNA) report forms part of a suite of protected species surveys undertaken by Phlorum Ltd. which were commissioned by the South Downs National Park Authority across land at Petersfield Heath, Hampshire. This eDNA survey assessed water bodies in and around Petersfield Heath, Hampshire for the presence or absence of great crested newt (*Triturus cristatus*) based on low concentrations of their shed skin, mucous and faeces in water samples.

The survey site is situated at Petersfield Heath, Hampshire, to the south-east of Petersfield, approximately 1.3km south-east of Petersfield town centre. Ponds within Petersfield Heath and an area extending 500 metres beyond the site boundary were surveyed where they were accessible and permission was provided.

The main findings of the survey are as follows:

- Three ponds were surveyed on 26th June 2018 for the presence of great crested newt; Heath Pond, a pond in the adjacent Petersfield pay and play golf course and a private pond in the garden of a house adjacent to the golf course (see Figure 1 – Appendix A).
- Agricultural Development Advisory Service (ADAS) eDNA kits were used to survey the ponds. The field sampling during the surveys followed strict protocol, as provided by ADAS and Natural England, to prevent contamination of the samples and to offer the best chances of detecting great crested newt DNA.
- The eDNA results were negative for the three ponds where water was sampled and subsequently analysed.
- Although suitable terrestrial habitat is present within the site and the wider surrounds the eDNA testing confirmed that great crested newts were not present in the three waterbodies tested.

Conclusions and recommendations, which include habitat management suggestions for other amphibians, are provided in section 5.

# 1. Introduction

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## Background

- 1.1 This Environmental DNA (eDNA) report forms one of a suite of protected species surveys undertaken by Phlorum Ltd. which were commissioned by the South Downs National Park Authority across land at Petersfield Heath (hereafter referred to as "the site").
- 1.2 This eDNA survey assessed water bodies in and around Petersfield Heath, Hampshire for the presence or absence of great crested newt (*Triturus cristatus*) based on low concentrations of their shed skin, mucous, gametes and faeces in water samples.

## Site Description

- 1.3 The survey site is situated at Petersfield Heath, Hampshire, to the south-east of Petersfield, approximately 1.3km south-east of Petersfield town centre. The site can be accessed on foot from many points but the car park is situated to the south of the site and accessed via the B2146 Sussex Road.
- 1.4 The site comprised of Heath Pond in the south-west of the site together with some amenity grassland, scattered trees, heathland, woodland, scrub and ditches. Buildings within the site area included the Plump Duck Coffee shop, Little School by the Lake day care centre and a building associated with a cricket pitch.
- 1.5 Within the immediate surrounds the site is predominantly encircled by residential properties forming the outskirts of Petersfield. At the southern corner of the site lies Petersfield pay and play golf course with some adjacent heathland and to the east there is arable land.
- 1.6 The National Grid Reference for the centre of the site is SU75493 22929. The site extends over approximately 35.6 hectares (ha).

## 2. Methodology

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### Data Search

2.1 Records for great crested newt from within a 2km radius of the site were obtained from the Local Records Centre (HBIC, 2019).

### eDNA

2.2 Environmental DNA (eDNA) analysis was approved by Natural England in 2014 for the determination of great crested newt presence or absence. All samples were taken in accordance with the Natural England technical advice note.

2.3 Sampling was undertaken at Heath Pond and 2 other off-site ponds on the 26th June 2018 by experienced Phlorum ecologists. Lead ecologists were registered to hold a Natural England great crested newt survey licence Class 1.

2.4 In accordance with the specified methodology, the field surveys followed a strict protocol to prevent contamination of the samples; this entailed:

- Gloves were worn at all times during the sampling process, and gloves were replaced between sample collection from the waterbody and pipetting into the sterile sub-sample tubes.
- Samples were collected without entering the water, i.e. the surveyor stood only on the waterbody bank or muddy waterbody edges. This prevented disturbance of the substrate to limit cross-contamination.

2.5 The field sampling protocol consisted of the following steps:

- 20 samples were taken from each waterbody. The location of sub-samples were spaced as evenly as possible around the waterbody margin. Sub-samples generally targeted areas with potential egg laying substrate (e.g. vegetation) and open water areas which newts may be using for displaying. Prior to sampling the entire water column was gently mixed using a ladle, whilst avoiding disturbing the sediment on the bed of the waterbody. Sampling of very shallow water was avoided where possible (less than 5-10 cm deep).
- Once 20 samples had been taken, the sample bag was closed securely and shaken for 10 seconds. This mixed any DNA across the whole water sample.
- A new pair of gloves were put on to keep the next stage as uncontaminated as possible.

- Using a clear plastic pipette approximately 15ml of water was taken from the bag and pipetted into a sterile tube containing 35ml of ethanol to preserve the DNA sample (i.e. the tube was filled to the 50 ml mark).
- The tube was shaken vigorously for 10 seconds to mix the sample and preservative. This is essential to prevent DNA degradation and was also repeated for each of the six conical tubes. Before taking each sample, the water in the bag was shaken to homogenise the sample, as DNA material constantly sinks to the bottom.
- The same sampling protocol was repeated for each of the three waterbodies located within the site or found within 500m of the site boundary. The samples were returned to the laboratory (ADAS) for the eDNA analysis to be completed.

## Caveat

### eDNA Constraints

- 2.6 eDNA assessments need to be carried out in the approved months (15<sup>th</sup> April to 30<sup>th</sup> June). If sediment is collected then it is possible that the DNA can remain in the sediment longer than it would if it was floating in the water, and could lead to a false positive. Sediment can also inhibit the analysis. If a pond is dry, or almost dry, then it will not be possible to collect enough sediment free water sample to analyse.

### 3. Baseline Conditions

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#### Aerial Photography and OS Maps

- 3.1 Aerial photography indicates that there are two ponds located within 500m of the site.

#### Ponds

##### Pond 1

- 3.2 Heath Pond at Petersfield Heath is on site (Grid reference SU 75328 22869) and of the three ponds sampled it is the largest, extending across approximately 9ha. This pond is used for boating and fishing and serves as an important recreational facility. It has emergent and edge plants and attracts a variety of wetland birds such as mallards (*Anas platyrhynchos*), coots (*Fulica atra*), cormorant (*Phalacrocorax carbo*), geese (*Anser* and *Branta* sp.) and swans (*Cygnus* sp.). The pond is surrounded by mown grass, a gravel path and woodland. There is a boardwalk adjacent to the B2146 Sussex Road.

##### Pond 2

- 3.3 Pond 2 is off site in Petersfield pay and play golf course adjacent to the B2146 Sussex Road (Grid reference SU 75572 22251). This 0.1ha pond has a small island at its centre and trees and shrubs adjacent to its boundary closest to the road and it lies 205 metres from the site at its closest point. There were some emergent and edge plants. Egyptian geese (*Alopochen aegyptiacus*) and their young were seen around and in this pond during the survey.
- 3.4 On the golf course there was also an ephemeral pond just south-west of the access road which did not contain water at the time of survey and therefore could not be sampled. This pond was approximately 125 metres from the site at its closest point.

##### Pond 3

- 3.5 Pond 3 was off site in a private garden north-west of the access road to Petersfield golf course (Grid reference SU 75422 22451) and is the smallest of the ponds which were sampled being only 0.05ha. It had managed banks with a few trees along its southern boundaries and some emergent vegetation and water lilies.

## 4. Results

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### Data Search

- 4.1 No records for great crested newt were returned from the data search for an area within 2km of Petersfield Heath (HBIC, 2019).

### eDNA

- 4.2 The results of the eDNA analysis are detailed below in table 1.

**Table 1 Results of eDNA analysis (Refer to figure 1 for the location of the waterbody).**

Sample ID	Waterbody	Waterbody grid reference	Detection of <i>Triturus cristatus</i>	Date of Analysis
2018-1539	Pond 1 - Heath Pond	SU 75328 22869	NO	27/06/2018
2018-1540	Pond 2 - Petersfield Golf course pond	SU 75572 22251	NO	27/06/2018
2018-1541	Pond 3 - Garden Pond	SU 75422 22451	NO	27/06/2018

- 4.3 Great crested newt DNA was not found to be present in any of the three ponds from which water was sampled and analysed .

# 5. Conclusions and Recommendations

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## Conclusions

- 5.1 Although suitable terrestrial habitat is present within the site and the wider surrounds the eDNA testing confirmed that great crested newts were not present in the three waterbodies tested.

## Recommendations

- 5.2 As great crested newts were not present within on-site waterbodies, or those up to 500m of the site boundary, no further great crested newt surveys are considered necessary as this species does not appear to be active within or adjacent to the site.
- 5.3 Although great crested newts were not recorded at Petersfield Heath some consideration can be given to amphibians generally. Fish and waterfowl, which are both present in Heath Pond, prey on amphibians and in addition wildfowl can strip aquatic vegetation from a pond and its shoreline, removing refuge and egg-laying substrates. The amount of time amphibians spend in aquatic and terrestrial habitats varies between species and environmental conditions, but generally most of their time is spent on land. There are some site enhancement measures which can be proposed which are generally favourable for amphibians and other wildlife such as reptiles and invertebrates ; these include:
- Log piles/ rubble piles/ rock piles/ earth banks could be installed within suitable habitat in close proximity to the pond. Log piles are ideal environments for amphibians; used for hibernation and as a refuge from predators. The dead wood also supports a diverse invertebrate fauna; a food source for a range of species including amphibians, reptiles and birds. Log piles should be orientated so as to maximise their daily exposure to the sun, with the longest side facing south. The log piles should be made from neatly stacked wood, ideally locally sourced where possible, stacked approximately 1m high, either in a pyramid shape (bound with wire to stop it breaking apart over time) or stacked against mature trees. Covering these structures with turf or loose earth may also be beneficial in areas where natural vegetation cover is sparse.
  - Ensuring a matrix of habitats present within 500m of a waterbody which ideally include:
    - scrub,

- woodland,
  - hedgerows,
  - banks and ditches,
  - leaf litter,
  - rough grassland,
  - bare ground with fissures,
  - disturbed ground, and
  - pasture.
-  Consider appropriate seasonal management, for example of terrestrial habitats between March and May and aquatic habitats between July and January. This could include;
- managing aquatic vegetation in ponds,
  - clearing trees and scrub around ponds so that only approximately only a quarter of the pond area is overhung or shaded,
  - desilting and clearing fallen leaves,
  - managing woodland and scrub, and
  - low mowing or cutting of grassland should be avoided in summer to reduce harming newly emergent frogs and toads. Amenity grassland and lawns should be kept mown short prior to this emergence to ensure that amphibians are not tempted to remain in grassland that may be mown shortly afterwards.

## Other

- 5.4 The habitat and environmental requirements of species, even amongst amphibians, can differ and it is possible that a suitable management for one species may be in conflict with the needs of another. Any changes in habitat management regimes should be carefully considered and monitoring for target species should be put in place before any major changes are made.
- 5.5 The results of this survey can be considered valid for two years from the date of survey after which time another survey should be undertaken to inform management decisions.

## **Appendix A**

## **Survey Map**



Legend

- Standing Water Areas
- Site Boundary Lines

**Figure 1: Ponds at and near Petersfield Heath**

Drawn by: HF  
On the: 10/01/2019  
Not to Scale  
Job No. 7826



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## **Appendix B**

### **Legislation**

# Legislation

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This section contains information pertaining to the legislation and planning policy applicable in Britain. This information is not applicable to Northern Ireland, the Republic of Ireland the Isle of Man or the Channel Islands. Information contained in the following appendix is provided for guidance only.

## Species

The objective of the EC Habitats Directive<sup>1</sup> is to conserve plants and animals which are considered to be rare across Europe. The Directive is transposed into UK law by The Conservation of Habitats and Species Regulations 2010 (as amended) (formerly The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) and The Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended).

The Wildlife and Countryside Act 1981 (as amended) implements the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and also implements the obligations set out for species protection from the Council Directive 2009/147/EC (formerly 79/409/EEC) on the Conservation of Wild Birds (EC Birds Directive) in Great Britain.

Various amendments have been made since the Wildlife & Countryside Act came into force in 1981. Further details pertaining to alterations of the Act can be found on the following website: [www.opsi.gov.uk](http://www.opsi.gov.uk). Key amendments have been made through the Countryside and Rights of Way (CRoW) Act (2000) and Nature Conservation (Scotland) Act 2004.

There are a number of other legislative Acts affording protection to species and habitats. These include:

- Countryside and Rights of Way (CRoW) Act 2000;
- Deer Act 1991;
- Natural Environment & Rural Communities (NERC) Act 2006;
- Protection of Badgers Act 1992; and
- Wild Mammals (Protection) Act 1996.

## Herpetofauna (Reptiles and Amphibians)

The following species receive full protection under the Conservation of Habitats and Species Regulations 2010 (as amended) through their inclusion on Schedule 2.

- sand lizard (*Lacerta agilis*);
- smooth snake (*Coronella austriaca*);
- natterjack toad (*Epidalea calamita*);

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<sup>1</sup> Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora.

- great crested newt (*Triturus cristatus*); and
- pool frog (*Pelophylax lessonae*).

Under this legislation, Regulation 41 prohibits:

- deliberate killing, injuring or capturing of species listed on Schedule 2;
- deliberate disturbance of any Schedule 2 species as to impair their ability:
  - to survive, breed, or reproduce, or to rear or nurture young; and
  - to hibernate or migrate.
- deliberate disturbance of any Schedule 2 species as to affect significantly the local distribution or abundance of the species;
- deliberate taking or destroying of the eggs of a Schedule 2 species;
- damage or destruction of a breeding site or resting place; and
- keeping, transporting, selling, exchanging or offering for sale whether live or dead or of any part of a species.

With the exception of the pool frog, these species are also currently listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Under this Act, they are additionally protected from:

- intentional or reckless disturbance (at any level);
- intentional or reckless obstruction of access to any place of shelter or protection; and
- selling, offering or exposing for sale, possession or transporting for purpose of sale.

Other native species of herpetofauna are protected solely under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended). These species include:

- adder (*Vipera berus*);
- grass snake (*Natrix natrix*);
- common lizard (*Zootoca vivipara*); and
- slow-worm (*Anguis fragilis*).

Under this legislation, for these species it is prohibited under Section 9(1) & (5) to:

- intentionally (or recklessly in Scotland) kill or injure these species; and
- sell, offer or expose for sale, possess or transport for purpose of sale these species, or any part thereof.

The following species are listed in respect to Section 9(5) of Schedule 5 of the Wildlife & Countryside Act 1981 (as amended) which only affords them protection against sale, offering or exposing for sale, possession or transport for the purpose of sale:

- common frog (*Rana temporaria*);
- common toad (*Bufo bufo*);
- smooth newt (*Lissotriton vulgaris*); and

- palmate newt (*L. helveticus*).



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