

THE ECOLOGY CO-OP.  
environmental consultants

518a Shepherds Lodge, Stag Park, Petworth, West Sussex, GU28 9LT

Tel: 01798 342 610 - E-Mail: [info@ecologyco-op.co.uk](mailto:info@ecologyco-op.co.uk) - [www.ecologyco-op.co.uk](http://www.ecologyco-op.co.uk)

## **Biodiversity Assessment and Ecological Management Plan:**

**The Crossing, Brambletyne Lane, Forest  
Row, RH18 5EH**

**Author: Ryan Walker**

**22<sup>th</sup> May 2015**



## Table of Contents

1	Introduction .....	2
1.1	Purpose of the Report .....	2
1.2	Background.....	2
2	Methodology.....	4
3	Results.....	5
3.1	Habitats .....	5
3.2	Protected Species.....	6
3.3	Net Biodiversity Gains Under Current Management.....	8
3.4	Potential Impacts to Local Designated Sites Under Current Management. ....	8
4	Discussion and Habitat management recommendations .....	12



## 1 INTRODUCTION

### 1.1 Purpose of the Report

This report details the results of a biodiversity assessment, ecological enhancement assessment and ecological management plan for the site referred to as The Crossing, Forest Row. The site comprises a narrow oblong field surrounded by mature hedges and woodland, on a south-east facing slope running down to a small stream. The location and appearance of the hedges suggest that the site is an 'assart', a field cut out of woodland leaving some of the original woodland trees to form the boundary hedge. This theory is supported by the presence of floral species that often occur as woodland indicator species.

The site has been managed as a low impact, small scale, sustainable and community based agricultural project. In addition, the site is actively management to promote biodiversity for local nature conservation.

This report details the net gain in biodiversity achieved through the active management of the site within the last five years. A number of management recommendations are made with the aim of enhancing the continued positive management of the site for biodiversity conservation. In addition, the potential impacts stemming from the site under its current/proposed use and management are considered for the Ashdown Forest SAC/SPA, 2km to the south of the site.

### 1.2 Background

The UK State of Nature report, a collaboration between 25 UK conservation and research organisations, lists the intensification of agriculture as one of the greatest causes of the recorded 60% decline in biodiversity within the UK over the last 50 years<sup>1</sup>. The loss of meadows, hedgerows and ponds, the increased use of pesticides, the abandonment of mixed farming, changes in cropping and the intensification of pastoral farming have all had a significant negative impact. However, the collaborative State of Nature team suggest that if properly designed, sustainable agri-environment schemes should be encouraged in the effort to help the nations' farmland nature to recover.

The site at The Crossing would have supported historical agricultural practices when first developed as an assart. This practice would have encouraged a unique assemblage of native flora and fauna as a result of these historical agricultural practices.

---

<sup>1</sup> Burns F, Eaton MA, Gregory RD, Al Fulajj N, August TA, Biggs J, Bladwell S, Brereton T, Brooks DR, Clubbe C, Dawson J, Dunn E, Edwards B, Falk SJ, Gent T, Gibbons DW, Gurney M, Haysom KA, Henshaw S, Hodgetts NG, Isaac NJB, McLaughlin M, Musgrove AJ, Noble DG, O'Mahony E, Pacheco M, Roy DB, Sears J, Shardlow M, Stringer C, Taylor A, Thompson P, Walker KJ, Walton P, Willing MJ, Wilson J and Wynde R (2013). State of Nature report. The State of Nature partnership



## THE CROSSING

Ultimately, the positive management of this site through low impact agricultural practices, similar to the historical practices that would have been undertaken at this site 100+ years ago, will enhance or restore the original native biodiversity to the site. Many of the species and habitats benefiting from these practices such as dormice (*Muscardinus avellanarius*), bats, farmland birds such as yellow hammer (*Emberiza citrinella*), ponds, species rich native hedgerows and meadows are now listed as Local and National Biodiversity Action Plan species and habitats.

The UK's Local and National Biodiversity Action Plans (BAP) were published in 1994, and were the UK Government's response to the Convention on Biological Diversity (CBD), which the UK signed up to in the 1992 Earth Summit in Rio de Janeiro. Biodiversity Action Plan species and habitats should be used to guide decision-makers such as local and regional authorities, in implementing their statutory duties to have regard to the conservation of biodiversity, in particular these habitats and species, in the exercise of their normal functions.



**Figure 1.** (Left) Map of the structure of the site at The Crossing, taken from the report produced by Sussex Nature<sup>2</sup>. (Right) Google Earth screen grab of the wider location of The Crossing. Figure orientated north to south.



## 2 METHODOLOGY

This work was carried out on 14/05/15 by Dr Ryan Walker BSc, MSc, a full member of the Chartered Institute for Ecology and Environmental Management (CIEEM) and a Chartered Environmentalist (CEnv). Dr Walker holds Natural England protected species survey licenses for bats, dormice and great crested newts (*Triturus cristatus*).

- A walk over survey following the methodologies developed by the CIEEM<sup>3</sup> consistent with undertaking a Preliminary Ecological Appraisal (PEA) was undertaken. This PEA establishes the presence of habitats potentially suitable to support the following protected species or taxonomic groups that have the potential to occur within a woodland and agricultural setting within Sussex; badgers (*Meles meles*), dormice bats, nesting birds, great crested newts, and the more widespread species of reptiles such as common lizard (*Zootoca vivipara*), slow worm (*Anguis fragilis*) and grass snake (*Natrix natrix*).
- During the walk over survey recent positive ecological enhancements were recorded within the site and assessed. In addition, net biodiversity gains were assessed from existing data collected by the 2012 floral survey undertaken by Sussex Nature and species lists of recent native floral planting upon the site by the current owners.
- The potential impacts of the site under its current management, as a low impact, small scale, sustainable community based agricultural project, upon the designated areas for nature conservation within the local area was assessed.

---

<sup>3</sup> CIEEM (2013) *Guidelines for Preliminary Ecological Appraisal*



### 3 RESULTS

#### 3.1 Habitats

The site supports four main habitats:

*Lowland meadow:*

The majority of the site supports a large species rich lowland meadow (Fig. 2). This habitat supports 27 floral species<sup>2</sup>. Lowland meadows are a Sussex BAP habitat, they are typically species-rich grasslands occurring on soils with a neutral pH, in the lowland areas. They are traditionally managed by hay cutting and/or grazing.

*Cultivated areas:*

There are two main areas cultivated within the site, to the northwest and to the southeast. The area to the northwest comprises of a small scale market garden type cultivated area with a poultry enclosure (Fig. 3). The area to the southeast is a forest garden type cultivated area with recently planted native trees.



Figure 2. Lowland meadow habitat that dominates the site.



Figure 3. The cultivated area to the northwest of the site.

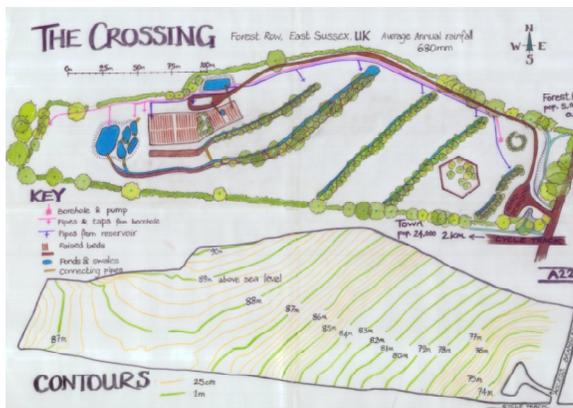


Figure 4. Schematic of the site showing the locations six ponds and bog and bung habitats.



Figure 5. One of the ponds to the west of the house.

*Ponds and wetland:*



## THE CROSSING

The site supports a network of six ponds of varying size and depth (Figs. 4 & 5). Ponds are listed as a Sussex BAP habitat and are highly bio-diverse habitats, supporting in excess of 1000 species in some established and well managed ponds. The site also supports five bog areas behind five purpose built soil bungs. The soil bungs are constructed of nutrient poor subsoil, that will in time, enable a diverse floral community to develop on account of the nutrient impoverish nature of the soil. Both the ponds, bog areas and bungs have recently been created within the last three years and planted up with native floral species. The ponds support at least 36 aquatic species of plant. The bog areas and soil bungs support at least 25 species of native flora.

### *Species rich hedges and liner broadleaved native woodland:*

The whole site is fringed by species rich hedgerows. The northern hedge (Figs. 1 & 6) is dominated by oak (*Quercus robur*), field maple (*Acer campestre*) and holly (*Ilex europaeus*) and supports six woody species, classing it a species rich hedge<sup>4</sup>. This hedge supports 10 native floral species. The southern hedge (Fig. 1) is dominated by hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*) and oak, this hedge supports six native woody species classing it as a species rich hedge. The southern hedge supports 10 ground floral species, including a small area of invasive Japanese knotweed (*Fallopia japonica*). The roadside area supports a small area of liner woodland dominated by oak and hazel (*Corylus avellana*), with a small stream running through part of it. This area supports 35 floral species and is an excellent example of native, ancient broadleaved woodland. This area supports what was once a former hazel coppice (Fig. 7).



Figure 6. Northern hedge dominated to the east by mature oak standards.



Figure 7. Liner woodland along the roadside boundary supporting a former hazel coppice.

## 3.2 Protected Species

### *Bats:*

The site supports excellent foraging habitat for bats along the margins of the linier hedge

<sup>4</sup> Where the structural species making up a 30m section of hedgerow include at least five woody species that are either native somewhere in the UK, or which are archaeophytes, the hedgerow is defined as species-rich. Climbers and bramble do not count towards the total except for roses. Hedgerows that contain fewer woody species but have a rich basal herbaceous flora may also be defined as species-rich, but the criteria to define these have to be set on a local basis as there is no national definition.



## THE CROSSING

and wooded areas. The hay meadow supports a species rich sward, which will in turn support a high diversity of flying insects and good forage for bats. The ponds could potentially support ideal foraging habitat for Daubenton's bats (*Myotis daubentonii*), that will forage almost exclusively over water bodies.

The larger trees within the hedges and the linier woodland have the potential to support roosting habitat for a number of species of bats, within cracks and rot holes.

### *Badgers:*

An extensive, active badger sett was recorded within the linier woodland area. The rest of the site supports ideal foraging habitat for badgers.

### *Great crested newts:*

A great crested newt habitat suitability index (HSI) assessment was undertaken for the larger pond to the west of the house<sup>5</sup>. The pond supports a score of 0.85 and therefore falls into the category of 'excellent' potential breeding habitat for great crested newts. Networks of ponds, of varying size and depth, as in the case of the site at The Crossing, are known to provide favourable habitat for great crested newts. Ponds that do not support fish populations, similar to the ponds at this site are also favoured as breeding habitat by great crested newts. These ponds support excellent aquatic plant diversity despite the ponds having only been in situ for two-three years. The site could be considered to support excellent potential aquatic and terrestrial habitat for great crested newts, and has the potential to be colonised by great crested newts at sometime in the near future. Great crested newts are Sussex BAP species, are known to occur within the local area and are an interest feature of the nearby Ashdown Forest SAC/SPA/SSSI<sup>6</sup>.

### *Reptiles:*

The site supports habitat that could be considered to have the potential to support reptiles such as slow worms, common lizard, grass snakes and adders. All four species are known to occur within the local area and are Sussex BAP species<sup>6</sup>. The marginal areas between the hedges and the hay meadow and the bungs, particularly with south facing aspects have the potential to support slow worms, common lizard and adders. Grass snakes have already colonised the marginal areas around the ponds and have been recorded on a number of occasions.

### *Dormice:*

The species rich hedges and the area of linier woodland supports habitat that could be considered to have the potential to support dormice. Dormice are known to occur within the area and are Sussex BAP species<sup>6</sup>.

### *Nesting bird habitat:*

All of the vegetation across the boundaries of the site support the potential to provide

---

<sup>5</sup> Oldham, R.S., Keeble, J., Swan, M.J.S. and Jeffcote, M. (2000) Evaluating the suitability of habitat for the great crested newt (*Triturus cristatus*). *Herpetological Journal* 10, 143-155.

<sup>6</sup> National Biodiversity Gateway database: <https://data.nbn.org.uk/>



## THE CROSSING

nesting habitat for a variety of species of birds during the breeding season. The meadow area has the potential to support ground nesting birds such as skylark (*Alauda arvensis*).

### 3.3 *Net Biodiversity Gains Under Current Management*

The site is currently managed with biodiversity conservation in mind. The following net gains in biodiversity have been achieved under current and/or recent management:

- Five ponds have been created that currently support 36 native species of aquatic plant. Ponds are one of the most threatened habitats within lowland England, with an estimated loss of half a million ponds with the last century and 80% of existing ponds within 'poor' or very 'poor condition'<sup>7</sup>. These ponds score highly when a great crested newt HSI was undertaken, suggesting that they are in good condition for high biodiversity and potential breeding habitat for amphibians. The ponds have been recorded supporting foraging grass snakes within the vegetation margins.
- A wetland system comprising of a system of five ditches (bog areas) and bungs have been recently created. The bungs comprise of nutrient poor subsoil, that will, in time create a species diverse sward of ground flora. The bungs provide good foraging and basking habitat for reptiles and a number of invertebrate species. The newly created wetland ditches (bog areas) have added greater diversity to the habitats already within the site. These wetland ditches provide ideal habitat to increase invertebrate and floral diversity within the site.
- There has been a 47% increase in floral diversity within the hay meadow habitat since the 2012 survey undertaken by Sussex Nature as a result of the recent planting scheme.

### 3.4 *Potential Impacts to Local Designated Sites Under Current Management.*

There are three designated sites within 2km of the site: Mills Rocks (SSSI), Ashdown Forest (SSI, SAC, SPA) and Weir Wood Reservoir (SSSI).

#### *Ashdown Forest*

This site is important due to its wet and dry heathland habitat. The site is designated due to its importance for great crested newts, nightjar (*Caprimulgus europaeus*) and Dartford warbler (*Sylvia undata*).

#### *Mills Rocks*

This site is designated due to its botanical importance, supporting a number of species with limited distributions including reed fescue grass (*Festuca altissima*), hay-scented buckler fern (*Dryopteris aemula*) and mosses and liverworts, including *Odontoschisma denudatum* and *Cephalozia connivens*.

<sup>7</sup> Williams, P. Biggs, J. Crowe, A. Murphy, J. Nicolet, P. Weatherby, A and Dunbar, M (2010). Ponds report from 2007. Countryside Survey Technical report No. 7/07.



### *Weir Wood Reservoir*

This site is designated due to its importance for overwintering and passage water birds.

Using the Wealden District Local Development Framework (WDLDF): Assessment of the Core Strategy under the Habitats Regulations<sup>8</sup>, it was decided to assess the following threats identified within local development frame work, upon the Ashdown Forest SAC/SPA. Ashdown Forest supporting a Habitats Directive designation (SAC, SPA). The WDLDF considers that Ashdown Forest and its interest features (great crested newts, nightjar and Dartford warbler) faced the following threats:

- Atmospheric pollution.
- Disturbance from recreation.
- Urbanisation effects on lowland heathland habitat.
- Surface water run-off impacts on hydrology.
- Deteriorating water quality.

### *Atmospheric pollution*

The WDLDF describes vehicle traffic as the overwhelming cause of atmospheric pollution in the UK. The proposed and current land use at The Crossing, will necessitate that a small amount of traffic will be entering the site (on average <5 cars per day). However, the current and proposed management of the site will reduce atmospheric pollution in the following ways:

- No dig, small scale agricultural projects, as proposed/being undertaken upon this site at The Crossing, inhibit the release of nitric oxides locked in soils that would otherwise be released into the environment through ground disturbance.
- Coppicing, hedge laying and a responsible mowing regime of the hay meadow, will promote more vigorous biotic growth of the floral species within the site. This increased vigour in growth will increase carbon dioxide absorption levels (a known green house gas). Therefore, the proposed management will cause a net reduction in carbon dioxide levels within the local atmosphere.
- All energy production upon the site will be undertaken using carbon free or carbon neutral methods; solar/photovoltaic energy, biochar/wood burning.
- Without available data to undertake a calculation of emissions generated by the site under its current/proposed use and the absorption rates of the site through its current/proposed use and management it is difficult to establish the impact of atmospheric pollution. However, an educated guess would suggest that the effects of potential atmospheric pollution stemming from The Crossing and potentially impacting the habitats of the SAC/SPA and its interest features (great crested newts, Dartford warbler and nightjar) are negligible.

### *Disturbance from recreation*

It is well understood that dog walking can have a negative impact ground nesting heathland

<sup>8</sup> UE Associates (2011). Wealden District Local Development Framework: Assessment of the Core Strategy under the Habitats Regulations.



## THE CROSSING

birds such as nightjar and Dartford warbler during the breeding season.

- There is no reason to suggest that the site under its current/proposed use and management will have any impact from recreational disturbance to the habitats of the SAC/SPA and its interest features.

### *Urbanisation effects on lowland heathland habitat*

The WDLDF<sup>8</sup> describes the following factors as impacts attributed to urbanisation; predation risk from increased domestic cat populations and the introduction of other invasive species and habitat deterioration through fly tipping.

- There is no reason to suggest that the site under its current/proposed use and management will have any impact from urbanisation to the habitats of the SAC/SPA and its interest features.

### *Surface water run-off impacts on hydrology and water quality*

The WDLDF<sup>8</sup> describes the following factors as impacts from surface water run-off impacts on hydrology, such as flash flooding from urbanisation and pollutants absorbed within these flood waters.

- There is no reason to suggest that the site under its current/proposed use and management will have any impact from surface water runoff to the habitats of the SAC/SPA and its interest features.
- The loss of ponds and wetland habitats throughout the UK within the last 100 years<sup>7</sup> is often cited as one of the causes of flooding, whereby these habitats used to work as sinks for flood waters. The construction of a network of ponds across the site could go some way to alleviating local flooding.

In summary, the current/proposed use and management of the land at The Crossing will at worst have a negligible effect upon the conservation status of the habitat at the Ashdown Forest SAC/SPA. The current/proposed management of the site could attribute some benefit to the populations of the interest features species upon the SAC/SPA, as follows:

### *Nightjar*

Nightjar are nocturnal moth feeding birds. The mowing regime undertaken and the proposed coppice regime at The Crossing will promote moth abundance and diversity. This could potentially create a small spillover effect of more moths reaching the areas of heathland at Ashdown Forest used by the nightjar.

### *Dartford warbler*

Dartford warbler are diurnal birds that feed on a variety of small, flying invertebrates. The mowing regime undertaken and the proposed coppice regime at The Crossing will promote invertebrate abundance and diversity. This could potentially create a small spillover effect of more flying invertebrates reaching the areas of heathland at Ashdown Forest used by the Dartford warbler.



## **THE CROSSING**

### *Great crested newts*

Populations of great crested newts, tend to exploit the wider landscape, whereby they will range over several kilometers moving between, terrestrial foraging or hibernacula areas and breeding ponds. The construction of a network of six wildlife ponds at The Crossing, will only enhance the breeding habitat opportunities for local great crested newt populations.



## **4 DISCUSSION AND HABITAT MANAGEMENT RECOMMENDATIONS**

The site at The Crossing supports a diverse array of habitats. The ponds, hay meadow, species rich hedgerows and broad leaved woodland are all priority habitats under the Sussex Biodiversity Action Plan. These habitats are of local importance for biodiversity conservation. The following management recommendations are suggested to maintain and improve the site for biodiversity:

### *Ponds:*

- Ensure that no fish are introduced into the ponds.
- Ensure that no non native, invasive aquatic plants are introduced to the ponds.
- Periodically thin out aquatic vegetation to insure that none of the ponds support more than 60% aquatic vegetation cover.
- Create a number of dead wood habitat piles upon the edge of the ponds, in an effort to improve invertebrate diversity and hibernacula for reptiles and amphibians.

### *Hay meadow:*

- Ensure that the meadow is mowed annually, during late summer and the arisings are removed to reduce nutrient input. This will ensure that sward diversity is maintained, promoting invertebrate diversity that will intern provide ideal foraging habitat for bats, farmland birds, reptiles and amphibians.
- If the meadow is to be grazed ensure that the meadow is grazed in a rotation system whereby small areas are grazed and the livestock periodically moved to reduce nutrient input to the ground.

### *Species rich hedgerows:*

- Remove the patch of Japanese knotweed within the southern hedge.
- Begin a five to ten year coppicing rotation within the mature sections of the northern and southern hedges. Focus on coppicing the hazel and the immature stands of oak, hawthorn, ash and willow. Faster growing species such as the hazel and willow can be coppiced every five years, slower growing species such as oak and ash should be coppiced every 10 years. The large oak, ash and holly standards within these hedges should be left. Coppiced material can be stacked and piled within the margins of the hedge to create deadwood habitat piles. These piles will provide refugia and hibernacula for reptiles, amphibians and small mammals. The decaying material will provide food and habitat for a variety of invertebrate fauna. Opening up areas of substrate will promote floral diversity within the coppiced areas. In time, dense re-growth within the coppiced stands will provide good nesting habitat for birds and nesting and foraging habitat for dormice. Coppicing should be undertaken during the winter months. Machines such as tractors should not be used within this area of the site during coppicing operations. This will reduce potential impact to dormice hibernation nests potentially present, that are typically constructed on the ground. this strategy will also help protect other hibernating fauna such as amphibians.



## THE CROSSING

- The north western section of northern hedge represents a more immature stand of species rich hedgerow, comparatively to the rest of the site. This section of hedge could benefit from being laid. Laid hedges provide a dense and continuous habitat and create ideal habitat for nesting birds and small mammals such as dormice. Arisings from the laying can be used as fuel wood or retained in situ as deadwood habitat piles. Hedge laying should be undertaken during the winter months.
- The species rich hedgerows and area of woodland could be subjected to a dormouse presence/absence survey using dormouse nest tubes. If dormice are present upon the site the management of the site could be tailored accordingly<sup>9</sup>

### *Linier deciduous ancient woodland:*

- The 2012 survey results, suggests that this area of woodland has excellent ground floral diversity, suggesting the presence ancient woodland soils. This floral diversity can be promoted by bringing the large hazel stands into a rotation coppice. Coppiced material can then be used for charcoal or biochar production. Coppicing can be undertaken on a five to 10 year rotation. Coppicing will enhance the nesting habitat small mammals and birds amongst the dense regrowth. Coppicing should be undertaken during the winter months. Machines such as tractors should not be used within this area of the site during coppicing operations to reduce potential impact to dormice hibernation nests, and other hibernating fauna. In addition, the use of machines could affect the structural integrity of the badger sett in this area and would be in breach of legislation protecting badgers and there setts.

### *Further management considerations:*

- Lighting should be kept to a minimum within the site, to reduce potential impact to foraging bats. If external lighting is required around the living areas, low intensity lighting should be used with downward facing baffles and timer switches<sup>10</sup>.
- The owners of the site are encouraged to engage local wildlife interest groups and monitors, such as the local mammal group, bat group, or moth/butterfly and floral recorders to monitor the biodiversity within the site. A number of locally rare moth species have already been recorded within the site. This data will aid in guiding the management of the site to favour interesting or locally significant/rare species. The data should be submitted to the Sussex Biodiversity Records Centre<sup>11</sup>

### *Impacts to designated sites within 2km of the site*

It is most likely that if all of the anecdotal information is considered, that on balance it is most likely The Crossing used under its current/proposed management will have a negligible effect upon the habitats within the Ashdown Forest SAC/SPA. If the habitats at The Crossing are well managed it could be possible that positive enhancements are made

---

<sup>9</sup> The local mammal group or the Peoples Trust for Endangered Species could advise on the availability of local licensed dormouse surveyors to carry out surveying work upon the site.

<sup>10</sup> Lacoueilhe A, Machon N, Julien J-F, Le Bocq A, Kerbiriou C (2014) The Influence of Low Intensities of Light Pollution on Bat Communities in a Semi-Natural Context. PLoS ONE 9(10): e103042. doi:10.1371/journal.pone.0103042

<sup>11</sup> <http://sxbrc.org.uk/>



### **THE CROSSING**

to the food sources of the nightjar and Dartford warbler, through spill over from flying invertebrates. The construction and management of the network of ponds at the crossing will have improved the wider landscape for local populations of great crested newts.