Knepp Wildland Project

Annual biodiversity report and monitoring update 2012

A wet year! **Charlie Burrell**

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1. Introduction

This year has seen some changes in ecological monitoring. At the Steering group meeting in November 2011, a number of issues were raised which resulted in the consensus that monitoring of the Wildland project should be reviewed. The initial Monitoring Strategy (Greenaway, 2007) that has been adhered to as far as funding would permit since 2005 was considered to be lacking by many on the Steering Group. One reason for this is that inevitably there has been a degree of 'project drift' in the 12 years or so since monitoring first began, with a number of new recruits to the Steering Group. The initial premise was that the action of large herbivores under a more naturalistic grazing regime would result in re-wilding that would be an end in itself; the aim being to observe changes rather than monitor any such changes towards stated targets. But a number of advisors think that ecological monitoring should be more target-led. Economic factors and the need to comply with agri-environmental funding have also combined to influence the direction that ecological survey and monitoring should pursue. A further meeting in February 2012 resulted in the decision to increase bird and butterfly monitoring, but left other aspects unresolved.

This update covers those aspects of the original monitoring strategy that were repeated in 2012, plus summaries of additional surveys and studies carried out by others. The annual repeat of the breeding bird and ragwort survey continued as in previous years. The butterfly survey, hitherto carried out by Rich Howorth, was taken over and extended by Neil Holmes. Two students carried out studies that, in addition to fulfilling the requirements of their university courses, also contributed to our knowledge of nightingale and turtledove occurrence on Knepp.

2. Summary of surveys

Copies of completed reports can be obtained from Knepp Castle Estate. Raw data is either held by KCE, T. Greenaway or the surveyor. The report of the Nightingale survey will be made available following its peer-reviewed publication.

2.1. Fauna

2.1.1. Breeding bird survey

This survey repeated that of 2005, 2007, 2008, 2009, 2010 and 2011. The purpose of this survey is to monitor changes in breeding birds over time as the Estate moves away from intensive arable land use to a more natural grazing system. The survey was undertaken by Paul James (James, 2012), who also carried out the previous years' surveys.

Two transects were surveyed from late March – June, one in the area north of the A272 and east of Shipley Road (area A) and another in the area south of Countryman Lane and west of New Barn Farm (area B). Ten visits were made to each transect. The surveys were conducted and the results mapped using the standard Common Birds Census species and activity codes, and digitised by Andrew Lawson (Sussex Biodiversity Record Centre).

The weather in 2012 was most unusual - March was warmer than average, but April and May slightly cooler than average. In fact, April was the coldest since 1989 and colder than March. After a dry winter in the southeast, April was the wettest on record. Not only was the summer cooler than average and exceptionally wet, we now know that 2012 was the wettest on record for England. This weather undoubtedly affected breeding birds, the unusually cold and wet spring resulting in the late arrival on the estate of some summer migrants, especially nightingale and whitethroat, the latter well down from 16 territories in 2011 to seven in 2012.

A total of 54 species was recorded, slightly down on the 56 species recorded in 2011, 60 species in 2010 and 61 species in 2009. Two 'new' species were noted in 2012 (peregrine and lesser black-backed gull) bringing the total since 2005 to 80. Of the 54 species, ten were Red List Species of High Conservation Concern and 13 Amber List Species of Medium Conservation Concern.

The more notable species included peregrine, turtle dove, cuckoo, barn owl, woodlark and nightingale, all of which (with the exception of peregrine) are either red or amber listed species of conservation concern. Both nightingale and turtle dove were the subject of more intensive surveys on the estate in 2012. There were two sightings of peregrines roosting on electricity pylons along transect A. As peregrines are now nesting on pylons elsewhere in the Sussex, this raises the possibility of nesting on the estate in the not too distant future. There were however no sightings of raven (another recent colonist) in 2012.

2.1.2. BTO Breeding Bird Survey (TQ1520)

The BTO Breeding Bird Survey[1] takes place annually over a number of 100m grid squares, one of which (TQ1520) lies within the Wildland Project area. A transect across this square has been recorded by a volunteer since 2007, with one survey taking place in April each year and a second in June. The Sussex Branch of the BTO kindly forwards the results. It is still too soon to identify significant trends, but 2012 saw the first records of lapwing, little owl and long-tailed tit in this grid square, although all these species have been recorded in the annual Breeding Bird surveys carried out by Paul James elsewhere on the Estate. The April 2012 survey recorded the highest number of species (34) since 2007 and the June survey the lowest. The low tally of 20 species recorded in June is undoubtedly a reflection of the poor weather. The eventual results of the BTO survey will be an interesting assessment of population trends across the UK, and will enable the Knepp results to be evaluated accordingly.

2.1.3. Nightingale survey

This survey, carried out by Olivia Hicks as part of her Master of Research degree at Imperial College London, focussed on the effects that re-wilding has had on the nightingale. She compared the number of territories identified on Knepp with the number located on intensively farmed land. This was well-conducted research and her results could have a significant influence on the future conservation of nightingale habitat.

2.1.4. Turtle dove survey

In spite f the unfavourable weather, this study by Simon Carter estimated that there were at least 3 pairs of Turtle Doves present: 1 pair at the south-eastern end Hammer Pond, 1 pair in Bentons Gorse and at least 1 pair in the stream gully running to the west of Brookhouse 6 and 7.

[1] http://www.bto.org/bbs/

2.1.5. Barn owl survey

Barrie Watson annually records barn owl breeding in nest boxes positioned in barns and trees across the Estate and rings the chicks. This year, 16 barn owl chicks and 3 new adult owls were ringed. The total number ringed since 1996 is now 137.

2.1.6. Butterfly survey.

Annual surveys of butterflies have now taken place for eight years. Initially conducted by Rich Howorth (Sussex Wildlife Trust), in 2012 the task of monitoring butterflies was taken on by Neil Hulme, Conservation Adviser for the Sussex Branch of Butterfly Conservation. The methodology previously employed by Rich Howorth has been maintained for the Northern and Middle Blocks, the details of which have been described in earlier reports. Neil Hulme has expanded on this methodology, such that the Northern and Middle block transect was walked over two days rather than one. In addition, the decision was taken to increase the number and spread of butterfly surveys across the Wildland project area to include the Southern Block, and a winter survey for brown hairstreak eggs.

Although 2012 was a very poor year for butterflies, indications that some species are reacting positively to habitat change in the Northern and Middle Blocks were seen in the increases in abundance and spread of the Essex skipper and green-veined white, probably due to increased availability of larval food plants. Species diversity over the Northern and Middle Blocks was maintained at the highest level yet recorded (18 species), equalling the figures for 2006 and 2011. A significant increase in abundance and diversity of butterflies was observed east of Horsham Common, probably due to an increased incidence of thistle which provides a good source of nectar and draws butterflies in from a wide area.

Butterfly surveys in the Southern Block

The new surveys focus on a fixed route covering a variety of habitats over part of the Southern Block and will be carried out twice a year. The route was determined during a visit on 17th June 2012, although in future years the timing will be brought forward to May, to record butterfly species which fly earlier in the year. The methodology employed for these two surveys is significantly different to the standard UKBMS Transect technique employed for the Northern and Middle Blocks area and will be conducted as Timed Counts. Details of the Southern Block route and methodology are given in the full survey report. The timed counts were carried out in June and July 2012.

In June 2012, only 69 individual butterflies and a diversity of only 9 species were recorded, the most notable of which was Small Heath, a UK Biodiversity Action Plan (UKBAP) Priority Species. The July survey was designed to 'capture' high summer species over this previously unsampled area of the Estate. A total of 549 butterflies of 16 species were recorded, dominated by the meadow brown and gatekeeper (together contributing 87% towards the total count), a similar situation to that seen in the Northern and Middle Blocks area. Several species of interest and potential significance were observed, including the green-veined white (common and widespread), marbled white and small copper. The most exciting record was that of a male purple emperor, seen over the oaks along a former field margin in the Pen Bridge West survey section.

Winter surveys

In addition to the expanded summer programme, from 2012 onwards there will be a winter survey of brown hairstreak eggs, to be undertaken annually and covering all blocks in sequence. Brown hairstreak was recorded in 2012, bringing the total number of butterfly species seen by Howorth and

Hulme over the Wildland project area to 29. On 22nd August three male brown hairstreaks were observed in a master tree (male assembly point) at the Hooklands Lane/Green lane intersect. Three eggs were found on blackthorn scrub near Broomer's Corner, during the Wildland project gathering held on 13th November.

2.1.7. Aquatic invertebrate survey

This survey was undertaken by J. M. Schmid-Araya (Bournemouth University), A. C. Campbell (Queen Mary University London) and P.E.Schmid (University of Vienna), who carried out the field work prior to recent work to re-naturalise the Knepp stretch of the Adur, but who have submitted the report this year. Benthic testate amoeba (Protozoa) and invertebrates were collected from 3 different sites within the western branch of the River Adur catchment. A total of 173 different species were identified, including at least three species thought to be new to the area. This was an interesting piece of research that the authors hope to repeat in order to evaluate fully the effects of the re-alignment.

2.2. Flora

2.2.1. Ragwort Monitoring

This was the fourth year that ragwort has been monitored. Patrick Toe carried out a visual assessment plus photographs of the 16 fields he first surveyed in 2009 (Toe & Greenaway 2012).

Ragwort abundance over the past four years has fluctuated. 2011 saw a resurgence in ragwort following a year of decline; 2012 has seen another decline almost down to the 2010 level of across most fields. Only two fields rated an 'A' rating, in comparison with seven in 2011. This is cause for optimism, and it seems that high levels one year do not necessarily mean that there will be even higher levels in the following year. Of the 16 fields monitored, Barn Field has shown the highest levels of ragwort overall, and perhaps could be the subject of additional control measures. Oaklands 2 and Broomers have consistently rated 'O', which does (tentatively) indicate some stability. Ragwort control will continue on an annual basis.

3. Incidental species records.

Perhaps the most significant record of 2012 was of a hazel dormouse seen in the Knepp woodyard by Paul Copsey in May. This is certainly the first known record of this protected species, and it is very good to have its presence confirmed on Knepp.

'Bird Track' recorded 30 species of bird at Honeypools and 19 species at Dial Post on 28th May 2012. As well as these records, eight species of conservation interest, including a woodlark, were recorded in May by a group of eminent ornithologists. Charlie recorded seeing a green sandpiper on a number of occasions during the year.

A few invertebrate records were made, including 23 species of dung beetle. In June, large red damselfly and scarce libellula were identified from photographs taken by Charlie. The latter species is rare, possibly increasing, and is a species not recorded in the 2005 Odonata survey. Paul Copsey also recorded seeing glowworms outside his caravan in the woodyard in June.

All these records indicate the value of the Wildland Project to wildlife and its biodiversity. However, for the full value of these records to be realised, it is necessary for each to be accompanied with the date the record was made, the location plus Grid Reference, and the name of the recorder. Further details such as abundance, sex where known or relevant etc are always of value.

4. Discussion.

Effective monitoring is one of the most difficult aspects of any ecological programme. It is time-consuming and usually costly to commission. Its success relies on the conscientious repeats of surveys at intervals typically set out in an initial strategy. Problems arise for a number of reasons, many of which can be seen to have affected the initial Knepp monitoring strategy.

- Project drift. The initial aims of the project have been to some extent superseded by alternative aims.
- Funding limitations. Repeat surveys can become more expensive over time.
- Dwindling enthusiasm for surveys that fail to show immediate environmental benefits.
- Changing focus on environmental issues in a wider context.
- Constraints imposed by estate economics and funding restrictions

The tendency for current advisors and members of the Steering Group to see different priorities from those embraced by the original advisors is understandable but not helpful to a long-term monitoring strategy devised with the original priorities in mind. Equally understandable is the frustration experienced when monitoring fails to deliver exciting changes over a short time interval. Many issues affect the speed in which plants and animals invade or disappear from an area – weather, dispersal rates of individual species and the resource pool from which recruits can spread being just three. Some of the best environmental datasets in the country as a whole have been those made by painstaking individuals repeating often fairly basic surveys annually over a very long period of time.

The issue of utilising volunteers and students to assist with long-term monitoring at Knepp has been much discussed. Both groups have the potential to make valuable, cost-effective contributions. But such effort has to be repeated according to an agreed methodology over a very long timescale in order to identify definite trends rather than fluctuations that may be due as much to weather as to the Project itself. Monitoring involving repeat methodology is only suited to long-term undergraduate courses where each new intake can carry out the repeat survey. On the whole, it is not suited to post-graduate theses, which have to demonstrate that the student is addressing novel topics.

But the over-riding influence on the Project as a whole has to be whether or not it is economically viable for the Knepp estate. A number of opportunities have been explored or have taken place, including those concerned with biodiversity, animal husbandry, public access and community engagement. The ever increasing fund of ecological knowledge is certainly confirming the many benefits to wildlife that the Wildland Project is initiating in clear comparison to intensive farming management. How best to evaluate these benefits will remain an intriguing topic for future debate.

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