Course Booklet

Knepp Estate 2023

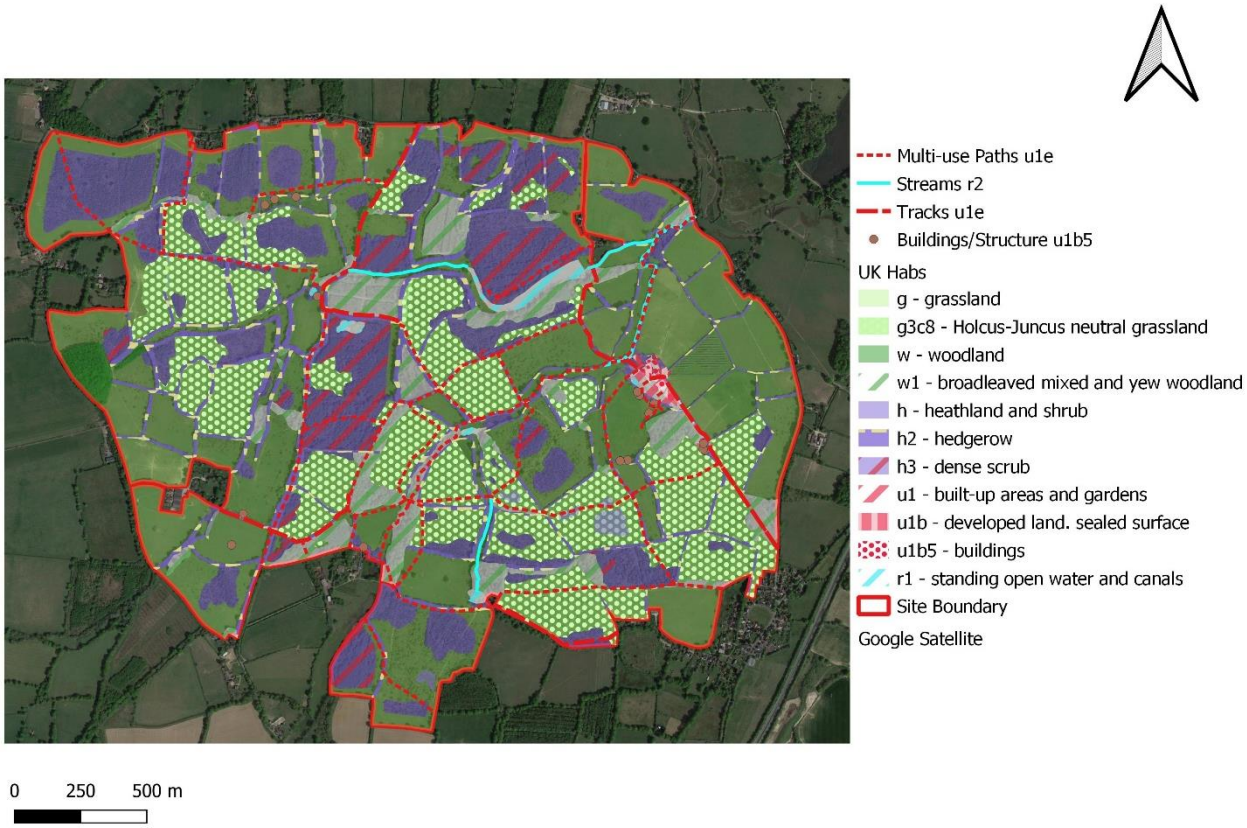
Contents

1. Study area

The vision of Knepp is not driven by specific goals or target species. Instead, the driving principle is to establish a functioning ecosystem where nature is given as much freedom as possible. In 2000 the landowners decided to give up farming because the return from the land was so poor (and had been poor for the last 20 years or more). The idea was to turn the whole 3500 acre estate back to nature – to work with the land rather than battling against it all the time. The results have been astonishing.

The 3500 acre estate at Knepp is being returned to a pre-human habitat by almost abandoning human intervention in the management of the landscape and allowing fields to revert to natural vegetation. With fallow and red deer, wild horses, long-horn cattle to mimic the effects of the extinct auroch and pig to mimic wild boar controlling the vegetation to produce a patchwork of different habitats. This approach was started in 2002 and has turned out to be visionary with many other farmers now looking to similarly restore areas of the country using this approach. The effect on wildlife has been breath-taking including massive increases in floristic diversity, insect abundance, many more butterflies including special species such as Purple Emperor, growth in the abundance of threatened bird species such as nightingales, and turtle doves and 13 of the 17 bat species returning to the land.

Figure 1. Map of the Knepp Estate including land use data.



2. Itinerary for Schools

Field Skills for Wildlife Management Careers

Practicals are aimed at developing relevant skills for wildlife careers. These include pollination surveys and how to quantify bird and mammal populations using techniques such as mist netting, DISTANCE sampling and camera trapping. Other surveys include UKHab mapping and calculation of the biodiversity value of a site using the DEFRA biodiversity metric which will open up opportunities for careers in ecological consultancy within the UK. The carbon practicals will look at how to quantify carbon in fields, hedgerows and trees and how the voluntary carbon market works and there is the opportunity to partake in herpetofauna surveys using cover boards. In the evenings there will be presentations from professional ecologists or climate change specialists in how they developed their careers and opportunistic acoustic surveys for bat species.

There is also the opportunity to learn how to use canopy access techniques to be able to undertake surveys in tree canopies. This is an optional extra course costing £170 provided by Canopy Access Ltd and you can do this half day practical instead of one of the other practicals being offered. All the equipment and training is provided and you will be accompanied into the canopy by an instructor. Seeing the Knepp estate at the same height as Purple Emperor butterflies defending their territories or nesting white storks is an amazing experience.

Ecology Survey Techniques and Data Analysis

This course includes all the elements of the field skills course above, including canopy access, but each survey is covered in slightly less detail to allow time for the data analysis portion of the course.

For part of each day the participants will be learning how to analyse large data sets using R (open source software used in most universities) so that skills are acquired to write up science reports based on data collected from field surveys. This is an important skill to acquire alongside the field survey skills if wanting to work in field ecology. This course is mainly aimed at those with a beginner knowledge or no experience of using R.

In the evenings there will be presentations from professional ecologists or climate change specialists in how they developed their careers and opportunistic acoustic surveys for bat species.

Field Skills, Data Analysis and Specialist Skills for Wildlife Management Careers

This course is a two week combination of the two shorter courses giving the opportunity to complete the data analysis course alongside achieving more in depth experience of the survey skills covered. During the weekend there is the opportunity to join further activities with the staff at the Knepp Estate, for example visiting the stork rehabilitation pen or learning more about the wild ponies.

Prospective Schedule for the Knepp Estate – Field Skills for Wildlife Management Careers

Date	Time	Activity
Sunday	5pm	Arrive Knepp. Tour of camp, settling in and dinner.
Monday	5:30am	Bird Survey – Mist netting and learning calls (Throughout morning)
	7am	Breakfast starts
	1pm	Lunch
	2pm	Bird survey – Point Counts
	6pm	Dinner
	7pm	Evening Activity – Talk from Scientist
Tuesday	7am	Breakfast Starts
	8:30am	Invertebrate Surveys – Sweep netting
	1pm	Lunch
	2pm	Invertebrate Survets – Trap checking, insect identification & sorting
	6pm	Dinner
	7pm	Evening Activity – Talk from Scientist followed by Bat Survey
Wednesday	7am	Breakfast Starts
	8am	Large Mammals – DISTANCE sampling & camera trapping
	1pm	Lunch
	2pm	Herpetofauna – Cover trap survey
	6pm	Dinner
	7pm	Evening Activity – Talk from Scientist – Light trapping
Thursday	7am	Breakfast Starts
	8am	Habitat Survey – Plant identification & grassland survey
	1pm	Lunch
	2pm	Habitat Survey – DEFRA Biodiversity Metric workshop & scrub survey
	6pm	Dinner
	7pm	Evening Activity – Talk from Scientist (optional bat or herp walk)
Friday	7am	Breakfast Starts
	9:30am	Rewilding Safari
	1pm	Lunch
	2pm	Small mammal trapping
	6pm	Dinner
	7pm	Evening Activity – End of week quiz!
Saturday	7am	Breakfast starts, clean and sweep out tents
	9am	Depart Knepp Estate for home

Prospective Schedule for the Knepp Estate – Ecological Survey Techniques & Data Analysis

Date	Time	Activity
Sunday	5pm	Arrive Knepp. Tour of camp, settling in and dinner.
Monday	5:30am	Bird Survey (throughout morning) Point counts and mist netting
	7am	Breakfast starts
	1pm	Lunch

	2pm	R Statistics Course or Syllabus Practicals
	6pm	Dinner
	7pm	Evening Activity – Talk from Scientist
Tuesday	7am	Breakfast Starts
	8:30am	Invertebrate Surveys
	1pm	Lunch
	2pm	R Statistics Course or Syllabus Practicals
	6pm	Dinner
	7pm	Evening Activity – Talk from Scientist followed by Bat Survey
Wednesday	7am	Breakfast Starts
	8am	Large Mammals
	1pm	Lunch
	2pm	R Statistics Course or Syllabus Practicals
	6pm	Dinner
	7pm	Evening Activity – Talk from Scientist followed by Herp Walk
Thursday	7am	Breakfast Starts
	8am	Habitat Survey
	1pm	Lunch
	2pm	R Statistics Course or Syllabus Practicals
	6pm	Dinner
	7pm	Evening Activity – Talk from Scientist followed by Bat Survey or Light Trap
Friday	7am	Breakfast Starts
	9:30am	Rewilding Safari
	1pm	Lunch
	2pm	R Statistics Course or Syllabus Practicals
	6pm	Dinner
	7pm	Evening Activity – Bioblitz and end of week fun quiz
Saturday	7am	Breakfast starts, clean and sweep out tents
	9am	Depart Knepp Estate for home

3. Field Research Activities

For all survey activities, students are split into smaller groups to minimize their impact on the environment and potential study species, and maximise their learning experience with the scientists.

Habitat Surveys

Students begin their survey by learning how to identify some of the most common grassland species. Once students are comfortable with this, they will visit a site on the estate and take quadrat data of all species present along a transect. Using this data, they then work through the UKHab key, the most recent and widely used method of habitat classification, to assign a habitat type to the site. If students are spending a full day surveying (i.e. those doing field skills or the two week option), they will also learn how to identify scrubland species and how to use UKHab in this instance too. All students will learn about the mapping of these

habitats and will also learn how to use the DEFRA biodiversity metric to produce a biodiversity score for their site.

Invertebrate Surveys

Students assist an entomologist in sampling invertebrates on the estate through a range of techniques, often weather dependent. This can include the setting up and checking of malaise traps or pan traps and often includes the use of sweep nets and how to use a pooter to collect samples as well. With these surveys, students also learn the basics of insect identification and will help to sort samples for further analysis.

Ornithological Surveys.

Students will have the opportunity to partake in two types of ornithological survey – mist netting and point counts or transects. During a static point count, the majority of observations are actually of bird calls. For this reason students will receive a briefing before taking part in point counts to learn the calls of more common species found on the Knepp estate. Ornithologists will also teach about the key identification points for the commoner birds. In the course of a point count activity, students will walk along a sample route with an ornithologist and stop at sample sites for 10 minutes to undertake point counts. When a group of birds is detected the team will record the species, the group size, the estimated distance to the birds and the method of observation (seen, heard, seen and heard).

Mist netting is undertaken for students to see this sampling technique first hand and to sample more cryptic scrub species which might not be detected by point counts. The area of nets and the time open will be recorded in order to compare against other sampling efforts, no matter the duration or time of day. When birds are caught, the trained ornithologist will demonstrate how they are removed from the net and handled. Each individual will be identified to species and students will be encouraged to make the identifications themselves, if necessary with reference to copies of field guides. The ornithologist will demonstrate how to take standard morpho-metric measurements (wing, tarsus, head, and tail with metal rulers) and weights are taken with a Pesola balance and bag. Birds will also be metal ringed for mark release recapture purposes. Students will help in these activities by passing equipment or scribing or by making measurements on birds handled by the ornithologist.

Mammal Surveys

Large mammals will be surveyed using distance sampling as they are conspicuous and many of the species present on the Knepp estate are not especially elusive. These data will be collected by walking the entire length of the transect line in small groups of 4-5 observers walking quietly and slowly (500-1,000 m/hr). Each time a mammal is encountered, the species, whether the animals were seen or heard, number of individuals (visual sightings only), perpendicular distance from the individual to the transect line, habitat, time, distance travelled along the transect line and weather conditions will be recorded.

In addition to transect surveys, mammals are monitored using camera traps – this is to ensure that data on presence or absence is collected for more elusive species such as the badger or fox.

Reptile Surveys

Opportunistic herpetofauna surveys entail walking a route from the campsite to check cover traps for individuals using them as refugia. The cover traps are corrugated iron and therefore create small heat traps for herpetofauna to bask in the warmth and increase their body temperature. Cover traps are approached quietly and lifted quickly, once lifted the students and herpetologist identify any species seen and the

number of individuals. If it is appropriate to do so, the survey leader will capture individuals for mark release recapture studies and to take morphometric data.

4. Data Analysis Training

This expedition will include a training course on data handling and analysis, with the aim of teaching students the hidden arts of working with real data sets. We will focus on the methods used by professional scientists, and take students through a challenging, but rewarding series of workshops. At the end of each workshop, students will be asked to complete a task, and at the end of the week they will combine these tasks into a standalone scientific report which we will provide feedback on.

5. Lectures

Lectures are delivered by scientists on site each week and aim to explore a variety of topics including areas of research related to rewilding, up to date information on current UK conservation legislation and potential career paths within the sector.

Each survey will also involve a short lecture detailing the methods used and inviting discussion on the positive aspects of these as well as the limitations.

6. Learning outcomes

The students should achieve the following learning outcomes from the fieldwork, practicals, lectures and discussions/activities. Many of these skills are transferable at all levels, but can also be used towards A Level, Higher or IB specifications with relevant syllabus content & practicals :

- Be able to define the term rewilding and the rationale behind this method of land management
- Be able to describe the key flora and fauna found in rewilded sites in Southern England
- Understand recent changes in legislation and how these have impacted funding systems available to farmers and land managers
- Identify key common grassland and scrub plant species of the UK
- Understand and apply recent systems in place for land cover and biodiversity assessment including UKHab and Defra Biodiversity Metric
- Describe key threats both currently and historically to UK wildlife and biodiversity
- Understand the concept of carbon and biodiversity credits and how private funding for these could be key to the future of conservation in the UK
- Experience in and understanding of biodiversity monitoring of a site, including understanding indicator species and the complexities of trophic webs
- Experience of mark-release-recapture techniques through bird mist netting
- Experience of both active and passive survey techniques for invertebrates including moth trapping, malaise trapping, pan trapping and sweep netting
- Experience of transect sampling to measure abundance and distribution of species including plants, mammals and birds

- Understanding of the use of camera traps to monitor more elusive or nocturnal species
- Define the different UK bat species and gain an understanding of their conservation status
- Experience in using audio equipment to collect presence/absence data of bats
- Understanding the cascade effect of historical megafauna and present-day herbivores on the habitat composition of sites in the UK and how this impacts biodiversity
- Experience in surveying woodland and scrub to quantify estimated carbon sequestration
- Understand and describe statistical analyses in the context of ecological surveys (where students are partaking in the data analysis course)
- Understand the need to balance conservation of habitats and species with human need with regard to succession management, ecosystem services, community engagement and maintatin biodiversity
- Understand the conservation techniques in place on the Knepp Estate and how these have led to such high levels of biodiversity across the different taxonomic groups