WEALD to WAVES

Connecting nature across Sussex

# BioBox Loan Scheme

## Survey Methods & Equipment Guide

Sussex Biodiversity Record Centre

LLOYDS BANKING GROUP

The Wildlife Trusts Sussex Wildlife Trust

# Contents

# Introduction

## How to use this BioBox

The BioBoxes are designed to encourage and support wildlife recording. There is no single correct way to use it. You might carry out one off surveys, set up long term monitoring, or use the equipment for engagement activities such as bioblitzes.

Please read your loan agreement carefully for guidance on safe and responsible use of the BioBox. A full equipment checklist is included and should be checked before and after use.

## Why we want you to carry out wildlife surveys

The Weald to Waves project aims to create a thriving nature corridor, connecting habitats across the Sussex landscape and supporting biodiversity.

By taking part in wildlife surveys, you are helping to build vital evidence about the species and habitats within the corridor. This information helps us understand what is present, where wildlife is thriving, and where additional support is needed.

**For information and help on recording while using the BioBox equipment please read the 'Submitting Your Records' section of this manual (page 60).**

# Your Records Make a Difference!

- Help identify species present in the corridor
- Highlight areas in need of conservation or restoration
- Highlight important ‘hot spots’ of species diversity and wildlife abundance
- Inform future initiatives to strengthen and expand the corridor

## Ecological Baseline Surveys

An ecological baseline survey provides a starting point for measuring change over time. To make comparisons meaningful, surveys should use the same methods and level of effort each time they are repeated.

Survey frequency depends on the species being studied and the timescale of habitat change. For example:

- Breeding bird surveys may be carried out several times each summer
- Plant surveys may take place less often, such as every three years, during the same month

Using consistent methods improves reliability and reduces bias in the data.

## Community Collaboration

By involving landowners and local communities, Weald to Waves aims to create a shared sense of responsibility for the natural world.

We hope that using the BioBoxes will not only support conservation but also help people build a stronger connection with the wildlife and habitats around them.

# Reptile Surveys

## Artificial Refugia Surveys

### Objective

Artificial refugia constructed of corrugated roofing material provide shelter and warmth, attracting reptiles and allowing for easy observation and identification.

### When to Survey

Surveys are most effective in spring and early autumn, when reptiles are most active, generally from mid March to late September. Check refugia in the morning or late afternoon, when reptiles are most likely to be basking beneath them.

### Where to Set Up

Choose quiet, undisturbed areas and avoid locations used regularly by dog walkers. Place refugia in habitats with good cover such as grassland, woodland edges, heathland, and scrub. Suitable locations include areas near ponds, marshes, or stream edges for damp loving species, but avoid flood prone areas.

Position refugia in sunny spots to allow them to warm up, with nearby vegetation, logs, or rocks for shelter. Avoid areas that are heavily shaded, overly wet, or frequently disturbed.

# Commonly Recorded Species

See which species you may record using artificial refugia

## Reptiles

- **Slow worm** (Anguis fragilis)
- **Common lizard** (Zootoca vivipara)
- **Grass snake** (Natrix helvetica)
- **Adder** (Vipera berus)

## Amphibians

- **Common frog** (Rana temporaria)
- **Common toad** (Bufo bufo)
- **Smooth newt** (Lissotriton vulgaris)

## Small Mammals

**Shrews, voles, and mice may also use refugia as shelter**

# Equipment List

Everything you will need for your reptile survey

## BioBox Equipment Required

- Artificial reptile refugia (number depends on survey area)
- Reptile identification guide

## Other Materials Needed

- GPS device or notebook to record refugia locations
- Gloves

We recommend recording with the Froglife reptile survey form

# Health and Safety Considerations

## Personal Safety

- Obtain landowner permission before placing or checking any refugia.
- Wear gloves to protect against sharp edges, hidden insects, and potential bites.
- Take care on uneven or slippery ground, particularly on rocky or wet surfaces.
- Check for ticks after the survey, especially when working in long grass or dense vegetation.

## Wildlife Welfare

- Do not place refugia near paths or in areas likely to be disturbed by people or dogs.
- Lift refugia slowly and carefully to avoid injuring animals. sheltering underneath
- Replace refugia gently in the same position after checking.

## Environmental Considerations

- Avoid placing refugia in areas prone to flooding or frequent disturbance.
- Ensure refugia are laid flat and securely positioned so they cannot move in wind.
- Remove all refugia and materials at the end of the survey period.

# Survey Methodology

## 1 Prepare and place refugia

- Select locations based on suitable habitat for reptiles. A density of around 10 refugia per hectare is recommended.
- Lay refugia flat and secure them so they cannot be moved by wind or animals.
- Space refugia evenly across the site to provide good coverage. When targeting known or likely reptile hotspots, refugia can be placed closer together, typically 2 to 5 metres apart.

## 2 Mark and record locations

- Label each refugium with a unique number.
- Record the location of each refugium using a GPS device or a detailed site map.

## 3 Allow settlement time

- Leave refugia undisturbed for at least one to two weeks to allow reptiles to find and begin using them.

## 4 Conduct the survey

- Check refugia in the morning or late afternoon, when reptiles are most likely to be basking or sheltering.
- Approach refugia quietly and walk carefully, as reptiles can detect ground vibrations.
- Before lifting, scan the surface of the refugium and nearby areas for basking reptiles.
- Lift refugia slowly and carefully, minimising disturbance and watching for fast moving or concealed animals.

## **Survey Methodology** (Continued...)

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### Record observations

- Identify and count any reptiles found using the identification guide.
- Record life stage, for example adult or juvenile, along with notable behaviour and environmental conditions such as temperature and cloud cover.
- Take photographs where helpful to confirm identification and for record keeping.
- Only handle reptiles if licensed and trained, and keep handling brief to minimise stress.

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### Complete the survey

- Repeat surveys throughout the reptile active season, from spring to early autumn.
- Remove all refugia at the end of the survey period to prevent littering or long term habitat disturbance.

# Bird Surveys

## Bird Transects & Point Counts

### Objective

Bird surveys aim to record the presence, abundance, and behaviour of birds within a given area. A bird survey transect involves establishing a route through a specific ecosystem and systematically collecting data along its length. Transects allow for systematic surveys over a set route, while point counts are ideal for static observation from a single location.

### When to Survey

Bird surveys are most effective in the early morning, shortly after sunrise, when birds are most active and vocal. Surveys are ideally carried out during the breeding season, from late February to early August, to maximise species detection.

### Where to Set Up

Conduct **transects** in habitats such as woodland, meadows, farmland, coastal paths, and urban parks. Choose routes that pass through a range of habitats to increase the variety of species recorded.

**Point counts** are well suited to gardens, parks, and other green spaces. Select a location with good visibility of trees, shrubs, and other features that attract birds.

# Commonly Recorded Species

See which bird species you may record on your surveys

## Woodland

- **Blue tit** (Cyanistes caeruleus)
- **Great rit** (Parus major)
- **Nuthatch** (Sitta europaea)
- **Treecreeper** (Certhia familiaris)
- **Blackbird** (Turdus merula)

## Grassland

- **Skylark** (Alaudala arvensis)
- **Meadow pipit** (Anthus pratensis)
- **Yellowhammer** (Emberiza citrinella)

## Urban areas

- **Starling** (Sturnus vulgaris)
- **Robin** (Erithacus rubecula)
- **Goldfinch** (Carduelis carduelis)
- **House sparrow** (Passer domesticus)

# Equipment List

Everything you will need for your survey


## BioBox Equipment Required

- Binoculars
- FSC Birds Wildlife Pack
- FSC Garden Safari Wildlife Pack

## Other Materials Needed

- Recording method (for example a notebook, recording sheet, or smartphone)
- GPS device (optional)
- Route map

We recommend recording with the BTO Breeding bird survey recording sheet

# Health and Safety Considerations

## Personal Safety

- Obtain landowner permission when surveying off public footpaths.
- Familiarise yourself with the route before starting the survey. Wear suitable footwear for uneven ground and dress for the weather.
- Carry a fully charged mobile phone and a map or GPS device.
- Bring drinking water, sun protection, and insect repellent where required.
- Check for ticks after the survey, especially when working in long grass or scrub.
- Inform someone of your route and expected return time, particularly if working alone.
- Carry a basic first aid kit for minor injuries or emergencies.

## Wildlife Welfare

- Keep a safe distance from nesting birds and avoid disturbing wildlife.
- Avoid repeated disturbance in the same area, particularly during the breeding season.

## Environmental Considerations

- Do not carry out surveys in extreme weather.
- Take care on slippery paths, steep slopes, and in areas of dense undergrowth.
- Avoid trampling sensitive vegetation while moving through survey areas.

# Survey Methodology

## Bird transects

### 1 Plan the route

- Select a transect route that passes through a range of habitats. The length can vary depending on the site.
- Walk the route in advance to ensure it is safe and accessible.
- Mark the route using a map or GPS, clearly identifying the start and end points.

### 2 Prepare for the survey

- Carry out surveys early in the morning or late afternoon, when birds are most active.

### 3 Conduct the transect

- Walk the route slowly and steadily, recording all birds seen or heard.
- Record birds within set distance bands from the transect line:
  - Within 25 metres
  - Between 25 and 100 metres
  - More than 100 metres
- Record species, number of individuals, and observed behaviours such as singing, feeding, or territorial displays.
- Use BTO two letter species codes if familiar.
- Take care to avoid counting the same individual more than once.

### 4 Record data

- Record the date, time, and environmental conditions, such as weather and temperature.
- For mixed flocks, estimate the number of adults present.

### 5 Repeat the survey

- Repeat transects multiple times during the breeding season, with a minimum of four visits to improve reliability.

# Survey Methodology

## Point counts

### 1 Select a location

- Choose a fixed point with good visibility and nearby features that attract birds, such as trees, shrubs, or feeders in gardens.

### 2 Prepare for observation

- Stand or sit quietly at the point for a few minutes to allow birds to settle.

### 3 Conduct the survey

- Observe birds using binoculars within a fixed radius, for example 20 metres.
- Record birds for a set time period, such as 10 minutes.
- Note species, number of individuals, and observed behaviours.

### 4 Record data

- Record the date, time, and weather conditions for each survey.

### 5 Repeat the survey

- Repeat point counts at the same location and time of day on multiple occasions to improve consistency.

# Mammal Surveys

## Camera Trapping

### Objective

A camera trap survey is a non-invasive method used to monitor and study wildlife, particularly nocturnal or elusive species, by capturing images or videos of animals in their natural habitats without disturbing them.

### When to Survey

Camera traps can be used year round, but surveys are most effective from early spring to late autumn when many species are more active. Check cameras regularly based on settings, battery life, and memory capacity, typically every one to two weeks.

### Where to Set Up

Place camera traps in areas of high wildlife activity, such as animal paths, water sources, or feeding areas. Suitable habitats include woodland, grassland, wetlands, and areas with clear signs of animal use, such as tracks or droppings.

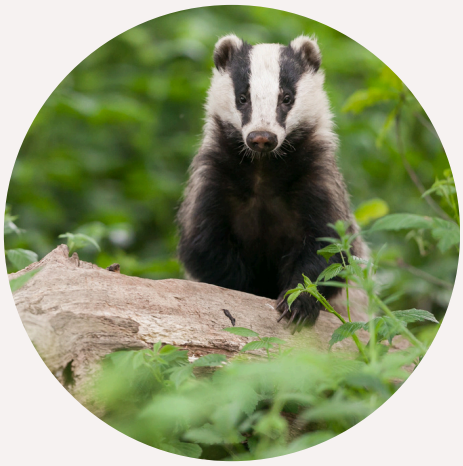
Position cameras along natural movement routes near features like trees, shrubs, fences, or streams, where animals are likely to pass in front of the lens.

# Commonly Recorded Species

See which species you may see on your camera trap

## Mammals

- **Badger** (Meles meles)
- **Red fox** (Vulpes vulpes)
- **Roe deer** (Capreolus capreolus)
- **Fallow deer** (Dama dama)
- **Grey squirrel** (Sciurus carolinensis)
- **Hedgehog** (Erinaceus europaeus)
- **Otter** (Lutra lutra)
- **Stoat** (Mustela erminea)



## Birds

- **Pheasant** (Phasianus colchicus)
- **Jay** (Garrulus glandarius)
- **Blackbird** (Turdus merula)
- **Tawny owl** (Strix aluco)
- **Grey heron** (Ardea cinerea)

# Equipment List

Everything you will need for your survey


## BioBox Equipment Required

- Browning Dark Ops Pro X 1080 camera/ Bushnell Prime L20
- SanDisk Ultra SD memory card
- Python mini cable lock
- Mount strap

## Other Materials Needed

- AA batteries (6 required)

# Health and Safety Considerations

## Personal Safety

- Obtain landowner permission before deploying any equipment.
- Take care when travelling to remote locations.
- Wear sturdy footwear and carry a fully charged mobile phone.

## Wildlife Welfare

- Avoid placing cameras near nests, dens, or other sensitive wildlife features.
- Minimise disturbance when installing and checking cameras.

## Environmental Considerations

- Secure cameras firmly to prevent movement, damage, or harm to wildlife.
- Choose sheltered locations and avoid exposure to heavy rain, strong winds, or extreme temperatures.
- Check weather conditions before deployment and during long survey periods.

Avoid setting up the camera near public footpaths to reduce the risk of theft or accidental damage. Always use the lock provided.

# Survey Methodology

## 1 Set up the camera

- Familiarise yourself with the camera and adjust settings as needed, using the instruction manuals provided or guidance videos.

Browning Dark Ops

Bushnell Prime L20

## 2 Choose a survey location

- Select a site showing clear signs of wildlife activity, such as tracks, droppings, trails, feeding areas, or water sources.
- Choose a quiet location with low foot traffic to reduce disturbance and false triggers.

## 3 Mount the camera

- Secure the camera at an appropriate height and angle for the target species using the provided straps.
- Adjust the camera so it covers the intended area clearly.
- Remove or move nearby vegetation that could trigger false detections.
- Insert batteries and the SD card.

## 4 Set camera settings

- Select the most suitable mode for your survey:
  - Time lapse mode for monitoring a fixed area over time
  - Motion activated mode for capturing animals as they pass
- Adjust trigger speed, image resolution, and video length as required.
- For nocturnal surveys, ensure the infrared setting is activated for night time images.

## **Survey Methodology** (Continued...)

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### Test the camera

- Walk in front of the camera to confirm it is detecting movement correctly.
- Review test images or videos and adjust position or settings if needed.

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### Deploy the camera trap

- Leave the camera in place for the planned survey period.
- If appropriate and permitted, a small amount of bait may be used to increase detections.
- Record the camera location using a GPS device or a clear reference point to allow easy retrieval.

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### Retrieve and review data

- Return to the site at the end of the survey period and retrieve the camera.
- Review images and videos from the SD card.
- Record species observed, along with dates, times of activity, and any notable behaviours.
- Save all images and videos, then clear the memory card ready for the next user. Keep the memory card inside the camera when returning the BioBox.

# Mammal Surveys

## Ink Tunnel Trap

### Objective

Ink tunnel traps are a method for detecting the presence of small mammals by recording their footprints as they pass through a tunnel with inked surfaces. This survey method is non-invasive, making it ideal for monitoring species without disturbing them.

### When to Survey

Ink tunnel surveys are most effective at night or during dawn and dusk, when small mammals are most active. Avoid deploying tunnels during heavy rain or strong winds, as this can damage equipment and obscure footprints.

### Where to Set Up

Place ink tunnels along hedgerows, fence lines, river banks outside flood prone areas, or woodland edges. Suitable locations also include grassy field margins, meadows, and areas near compost heaps or log piles.

Focus on sites showing signs of small mammal activity, such as droppings, runs, or well used pathways.

# Commonly Recorded Species

See which species you may record in your ink tunnel trap

## Small Mammals

- **Bank vole** (Myodes glareolus)
- **Field vole** (Microtus agrestis)
- **Common shrew** (Sorex araneus)
- **Pygmy shrew** (Sorex minutus)
- **Hedgehog** (Erinaceus europaeus)
- **Wood mouse** (Apodemus sylvaticus)
- **Weasel** (Mustela nivalis)
- **Stoat** (Mustela erminea)
- **House mouse** (Mus musculus)
- **Brown rat** (Rattus norvegicus)

## Occasionally

- **Harvest mouse** (Micromys minutus)
- **Polecat** (Mustela putorius)
- **Water vole** (Arvicola amphibius)

# Equipment List

Everything you will need for your ink tunnel footprint survey


## BioBox Equipment Required

- Charcoal powder
- Flatpack footprint tunnels
- Metal fixing pegs
- Mammal track identification guide

## Other Materials Needed

- White A4 paper
- Bait such as wet cat or dog food
- Masking tape
- Vegetable oil
- Shallow bait tray
- Gloves

# Health and Safety Considerations

## Personal Safety

- Wear gloves when handling bait, paper, or tunnel materials.
- Avoid direct contact with animal droppings, urine, or saliva.
- Wash hands thoroughly after handling traps or equipment.

## Wildlife Welfare

- Check tunnels daily to ensure no animals are trapped, injured, or distressed.
- Remove or reposition tunnels if non target species are repeatedly disturbed.

## Environmental Considerations

- Place tunnels where they will not create trip hazards.
- Avoid locations where tunnels may be disturbed by pets or other animals.

# Survey Methodology

## 1 Prepare the tracking area

- Place the tracking papers inside the tunnel base so that one sheet sits at each end.

## 2 Attach the bait tray

- Place the bait tray in the centre of the tunnel between the two paper sections.
- Secure the tray in place with tape and add bait.

## 3 Prepare the ink pads

- Mix equal parts charcoal powder and vegetable oil in a small container to create a thick ink.
- Fill the gaps between the paper and the bait tray with strips of masking tape.
- Spread the mixture onto the ink pad sections between the paper and the bait tray so animals must walk through the ink before reaching the bait.

## 4 Assemble the tunnel

- Fold the flatpack tunnel into its triangular shape and secure it following the instructions provided.

## 5 Position the tunnel

- Place the tunnel in a quiet, sheltered location.
- Use the metal pegs to secure it to the ground.
- Leave the tunnel in place for up to one week and check it daily for activity.

# **Survey Methodology** (Continued...)

## 6 Record and identify tracks

- When footprints are present, photograph them with a ruler placed next to the tracks for scale.
- Use the identification guide and recommended online resources to identify the species.

## 7 Reuse the tunnel

- Replace the tracking papers and refresh the ink mixture before redeploying the tunnel if needed.
- The tunnel can be reused in the same location or moved to a new site.

**Want to make your own footprint tunnel?**

If you would like to construct additional tunnels or use your own materials, watch this video:

# Mammal Surveys

## Bat Transects & Bat Detectors

### Objective

An ecological survey transect involves establishing a route through a specific ecosystem and systematically collecting data along its length. Bat transects are a method for detecting and identifying bat species by recording their echolocation calls as they forage or commute

### When to Survey

Bat transects are most effective between May and September, when bats are most active. Surveys should be carried out shortly after sunset on dry, calm evenings, as wind and rain can significantly reduce bat activity.

### Where to Set Up

Choose routes that include a mix of open and sheltered habitats to maximise species detection. Suitable locations include:

- Woodland edges and clearings
- Hedgerows and field boundaries
- Wetlands and watercourses
- Urban parks and gardens
- Churchyards

# Commonly Recorded Species

See which species you may record using bat detectors

## Bats

- **Common pipistrelle** (Pipistrellus pipistrellus)
- **Soprano pipistrelle** (Pipistrellus pygmaeus)
- **Noctule** (Nyctalus noctula)
- **Serotine** (Eptesicus serotinus)
- **Daubenton's bat** (Myotis daubentonii)
- **Brown long-eared bat** (Plecotus auritus)

## Nocturnal Species

**On your survey you may also observe other nocturnal species such as hedgehogs, foxes, badgers, owls, frogs, and toads.**

# Equipment List

Everything you will need for your bat survey


## BioBox Equipment Required

- Echo Meter Touch 2 and/or Magenta Bat 5 bat detector
- A Guide to British Bats
- High visibility vest

## Other Materials Needed

- Smartphone/tablet with Echo Meter app (for Echo Meter Touch 2). **Note the Echo Meter Touch 2 requires a USB-C port.**
- Notebook and pen/pencil for field notes
- GPS device or map for route tracking
- Torch or headlamp
- 4 x AAA batteries

We recommend recording with the Bat Conservation Trust Sunset Survey recording form

# Health and Safety Considerations

## Personal Safety

- Obtain landowner permission when surveying off public footpaths.
- Familiarise yourself with the route before starting the survey.
- Carry a torch or headlamp and wear high visibility clothing when near roads or paths.
- Inform someone of your route and expected return time.
- Survey in pairs or small groups where possible.

## Wildlife Welfare

- Avoid disturbing bats, roosts, or other wildlife.
- Do not enter roost sites or handle bats unless licensed and trained.

## Environmental Considerations

- Avoid surveys in extreme weather, including heavy rain, strong winds, or lightning.
- Take care on slippery paths, steep slopes, and in dense vegetation.
- Protect electronic equipment from moisture and accidental damage using waterproof cases.

# Survey Methodology

## 1 Plan the transect

- Define a transect route of approximately 1 to 3 km that passes through a range of habitats to maximise bat detections.
- Avoid areas with high levels of noise or artificial lighting where possible.
- Walk the route during daylight to check it is safe and accessible.
- Mark the route on a printed map or using a route tracking app.

## 2 Prepare the equipment

**Echo Meter Touch 2**

- Download the free app from your device's app store and familiarise yourself with its features, including real time call display and recording.
- Ensure your phone or tablet is fully charged and has sufficient storage space.
- Set the geographic location to Europe and United Kingdom to ensure British species are detected.
- Connect the Echo Meter Touch 2 to your device and test that it is working correctly.

**Magenta Bat 5**

- Check batteries before use.
- Familiarise yourself with the frequency ranges and settings used to detect bat calls.

## 3 Start the survey

- Begin the transect shortly after sunset.
- Walk the route at a steady pace, stopping briefly where needed to listen for bat calls.

# **Survey Methodology** (Continued...)

## 4 Record bat calls

**Echo Meter Touch 2**

- Allow the app to automatically record echolocation calls and display spectrograms to assist with identification.

**Magenta Bat 5**

- Listen for bat calls and note the frequency and call pattern, such as rapid clicks or slaps.
- Use the included bat guide (or see table on the next page) to support identification based on echolocation frequency.

## 5 Record observations

- Record the time, location, and habitat for each bat detection.
- Note environmental conditions such as temperature, wind, and cloud cover.
- Use the Echo Meter app or identification guides to confirm species where possible.

**Equipment Tutorial Videos**

Echo Meter Touch 2

Magenta bat 5 bat detector

# UK Bat Detector Frequency Guide

Typical peak frequencies for UK bat species

| Frequency (kHz) | Bat species |
|---|---|
| 20 to 25 | Noctule |
| 25 | Leisler's |
| 27 | Serotine |
| 32 | Barbastelle |
| 39 | Nathusius's pipistrelle |
| 43 to 46 | Alcathoe |
| 45 | Common pipistrelle |
| 45 | Whiskered |
| 45 | Brandt's |
| 45 | Daubenton's |
| 45 to 50 | Brown long-eared |
| 45 to 50 | Grey long-eared |
| 50 | Natterer's |
| 50 | Bechstein's |
| 55 | Soprano pipistrelle |
| 80 | Greater horseshoe |
| 108 | Lesser horseshoe |

*Frequencies shown are typical peak values, overlap between species can occur.*

# Invertebrate Surveys

## Pond Dipping

### Objective

Pond dipping is a hands-on method for studying aquatic biodiversity including freshwater invertebrates, amphibians, and other small aquatic life. By collecting and observing organisms in a pond or freshwater habitat, this survey method provides valuable insights into species composition, water quality, and ecosystem health.

### When to Survey

Pond dipping surveys are best carried out in spring and summer, when aquatic life is most active. Surveys should take place during daylight hours to maximise visibility and sampling success.

### Where to Set Up

Carry out pond dipping in shallow, accessible areas of ponds, lakes, or slow moving streams with a range of aquatic vegetation. Choose locations with a mix of sun and shade, and avoid strong currents, steep or unstable banks, and polluted water.

Children must always be supervised near water and surveys should follow the relevant risk assessment, as outlined in your loan agreement.

# Commonly Recorded Species

See which species you may record while pond dipping

## Invertebrates

- **Water boatmen** (Corixidae)
- **Pond skaters** (Gerridae)
- **Water beetles** (Dytiscidae)
- **Freshwater shrimp** (Gammarus pulex)
- **Damselfly and dragonfly nymphs** (Zygoptera and Anisoptera)
- **Caddisfly larvae** (Trichoptera)
- **Water snails** (Lymnaeidae and Planorbidae)

## Vertebrates

- **Tadpoles** (Frogs and Toads)
- **Newts** (Smooth, Palmate, Great Crested)
- **Stickleback fish**

# Equipment List

Everything you will need for your pond dipping survey

## BioBox Equipment Required

- White sorting trays
- Clear plastic magnifiers
- Pond nets
- Collecting pots
- Pipettes
- FSC Wildlife Pack, Ponds

# Health and Safety Considerations

## Personal Safety

- Obtain landowner permission before carrying out surveys.
- Wear suitable footwear or waders to reduce the risk of slipping in muddy areas.
- Avoid deep, steep, or unstable pond edges.
- Only sample within comfortable reaching distance and do not lean over the water.
- Never survey near water alone and supervise children at all times.
- Avoid direct contact with pond water and wash hands thoroughly after the survey.

## Wildlife Welfare

- Handle organisms carefully and minimise handling time.
- Return organisms quickly and never move animals between sites.
- Separate predators from other organisms where possible.
- Keep trays shaded to avoid overheating and stress.

## Environmental Considerations

- Clean nets, trays, and equipment between surveys to prevent cross contamination.
- Avoid damaging pond edges or aquatic vegetation during sampling.

# Survey Methodology

## 1 Prepare the equipment

- Fill a white tray halfway with pond water to provide a temporary holding area for organisms.

## 2 Sweep the pond

- Use the pond net to make gentle figure of eight sweeps.
- Sample at different depths, including the surface, mid water, and near the bottom.
- Avoid excessive disturbance of the pond bed to prevent sediment clouding and harm to organisms.
- Lift the net smoothly out of the water to retain the catch.

## 3 Transfer the catch

- Move away from the pond edge and empty the net into the tray of pond water.
- Rinse the net in the tray to ensure all organisms are transferred.

## 4 Examine and identify

- Allow sediment to settle before examining the tray contents.
- Use the identification guide to identify and record species, taking photographs where helpful.
- Use a pipette and collecting pot to isolate small organisms for closer inspection if needed.

## 5 Repeat sweeps

- After recording results, carefully return contents of tray to pond and refresh the tray with clean pond water.
- Repeat sampling in different areas of the pond using varied sweeping techniques.

# **Survey Methodology** (Continued...)

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## Explore the pond bottom (optional)

- If sampling the pond bottom, sift gently through sediment to avoid damaging organisms.

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## Return organisms and clean equipment

- Return all organisms carefully to the pond before moving to a new location or ending the survey.
- Rinse all equipment thoroughly after use to prevent the spread of invasive species or contaminants between sites.

# Invertebrate Surveys

## Sweep Netting & Beating Sheet

### Objective

Sweep netting and beating sheet surveys are complementary methods for sampling and identifying invertebrates in vegetation. Sweep nets target flying and surface-dwelling insects in grasses and shrubs, while beating sheets capture insects and other invertebrates dislodged from trees and bushes.

## When to Survey

Beating sheet and sweep netting surveys are most effective from spring through to late summer, when invertebrate activity is highest. Surveys should be carried out in dry, calm conditions, as wind and rain reduce catch success.

## Where to Set Up

**Sweep netting**

Best suited to grassland, meadows, field margins, hedgerows, low shrubs, and wetland edges where dense vegetation supports invertebrates.

**Beating sheets**

Ideal beneath woodland edges, tree canopies, isolated shrubs, bushes, and dense hedgerows where invertebrates shelter and feed.

# Commonly Recorded Species

See which species you may record on your surveys

## Sweep Netting

- **Grasshoppers and crickets** (Orthoptera)
- **Leafhoppers** (Cicadellidae)
- **Butterflies and moths** (Lepidoptera)
- **Beetles, including ladybirds and ground beetles** (Coleoptera)
- **Flies** (Diptera)

## Beating Sheet

- **Spiders** (Araneae)
- **Caterpillars**
- **Beetles, including weevils and bark beetles**
- **True bugs, including shieldbugs and leaf bugs** (Hemiptera)

# Equipment List

Everything you will need for your invertebrate surveys

## BioBox Equipment Required

- Sweep net
- White beating sheet
- White sampling tray
- Magnification boxes or hand lenses
- FSC Wildlife Pack, Winged Insects
- FSC Garden Safari Wildlife Pack

## Other Materials Needed

- Notebook and pen or pencil

# Health and Safety Considerations

## Personal Safety

- Obtain landowner permission before carrying out surveys.
- Wear suitable footwear and gloves to protect against uneven ground, sharp objects, stings, or bites.
- Take care on muddy, slippery, or rocky surfaces.
- Be aware of hazardous plants such as nettles or brambles.
- Check for ticks after surveying, especially in long grass or dense vegetation.

## Wildlife Welfare

- Handle insects gently and keep handling time to a minimum.
- Return specimens to their habitat promptly after identification.
- Avoid over handling delicate or hard to identify species.

## Environmental Considerations

- Avoid excessive disturbance to vegetation during sweeping or beating.
- Take care not to damage habitats or disturb rare or protected species.

# Survey Methodology

## Sweep netting

### 1 Prepare the equipment

- Have a white tray and collecting containers ready for examining specimens.

### 2 Select the survey area

- Choose areas with dense or tall vegetation, such as grassland, meadows, field margins, or hedgerows.

### 3 Begin sweeping

- Hold the net with both hands and sweep through vegetation using a figure of eight or wide arc motion.
- Vary the height of sweeps to sample different invertebrate groups.

### 4 Collect specimens

- Sweep across a short section of vegetation, approximately one to two metres, then quickly lift the net upwards.
- Carefully empty the contents into the white tray or collecting containers.

### 5 Examine and identify

- Examine specimens using a magnifying glass if needed.
- Use the identification guide to identify and record species, taking photographs where helpful.

# **Survey Methodology** (Continued...)

6

## Repeat the survey

- Continue sweeping in different areas to capture a wider range of species.
- Record species and numbers in a notebook or recording sheet.

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## Handle specimens carefully

- Handle invertebrates gently and keep handling time to a minimum.
- Release specimens carefully once identified or photographed.

# Survey Methodology

## Beating sheet

### 1 Select a location

- Choose trees, shrubs, or hedgerows likely to support invertebrates.
- Sample a range of plant species to increase diversity.

### 2 Set up the beating sheet

- Hold the beating sheet flat and horizontally beneath the branches being surveyed.

### 3 Beat the vegetation

- Gently tap or shake branches using a stick or pole to dislodge insects.
- Avoid excessive force to prevent damage to plants.

### 4 Collect and record

- Inspect the sheet and collect specimens using containers or pooters if required.
- Identify and record species using the identification guide.
- Release insects after recording, unless specimens are needed briefly for further examination.

# Invertebrate Surveys

## Moth Trap

### Objective

The NHBS moth trap starter kit is a portable and lightweight tool designed for the effective monitoring and study of moth populations. This non-lethal method enables species identification, behavioural observation, and data collection.

### When to Survey

Set up the moth trap at dusk and leave it running overnight, collecting it before first light. Trapping is most effective on warm, dry nights, as moth activity is reduced in cold, wet, or windy conditions.

### Where to Set Up

Place moth traps in sheltered, dark locations away from other light sources. Suitable sites include gardens, woodland edges, meadows, and areas near nectar rich plants such as honeysuckle or buddleia.
Avoid exposed or windy locations and ensure the trap is positioned on stable, level ground to maximise the range of species attracted.

# Commonly Recorded Species

See which species you may record in your moth trap

## Spring

- **Common Quaker** (Orthosia cerasi)
- **Small Quaker** (Orthosia cruda)
- **Chestnut** (Conistra vaccinii)
- **Hebrew Character** (Orthosia gothica)
- **Brimstone** (Opisthograptis luteolata)

## Summer

- **Garden Tiger** (Arctia caja)
- **Buff Ermine** (Spilosoma luteum)
- **Common Footman** (Eilema lurideola)
- **Elephant Hawk moth** (Deilephila elpenor)

## Autumn & Winter

- **Herald** (Scoliopteryx libatrix)
- **Mottled Umber** (Erannis defoliaria)
- **December Moth** (Poecilocampa populi)

# Equipment List

Everything you will need for your moth survey


## BioBox Equipment Required

- NHBS moth trap starter kit, including:
- Moth trap
- Carry bag
- Power supply
- 20 W BL368 blacklight bulb
- Instruction manual
- Collecting pots
- Concise Guide to the Moths of Great Britain and Ireland

## Other Materials Needed

- Egg boxes or similar cardboard inserts

# Health and Safety Considerations

## Personal Safety

- Obtain landowner permission before carrying out surveys.
- Do not handle the light or electrical components while the trap is switched on.
- Avoid using the trap during heavy rain or adverse weather.
- Keep power supplies dry and protected.
- Use a head torch or torch when working in the dark and wear reflective clothing if near roads or paths.

## Wildlife Welfare

- Handle moths gently and keep exposure to light to a minimum to reduce stress.
- Release moths promptly into nearby vegetation or cover after identification.

## Environmental Considerations

- Place traps away from water and sensitive habitats.
- Avoid locations where the light may disturb other wildlife.

# Survey Methodology

## 1 Assemble the trap

- Follow the manufacturer's instructions to assemble the trap, ensuring the frame, funnel, and light source are securely fitted.
- Check that all parts are stable before use.
- **When fitting the blacklight bulb:**
- Screw the bulb in firmly to create a waterproof seal, but do not overtighten.
- If the bulb does not light, switch off the trap, tighten slightly, and test again.

## 2 Choose a suitable location

- Select a sheltered, open area away from artificial light sources.
- Place the trap on level ground near a variety of habitats or nectar rich vegetation.
- Avoid wet or flood prone areas where equipment may be damaged.

## 3 Prepare the trap interior

- Line the inside of the trap with egg boxes or similar materials to provide resting spaces for moths.

## 4 Activate the trap

- Switch on the light at dusk, when moths become active.
- Check the trap occasionally to ensure it is functioning correctly, particularly in windy conditions.
- Do not operate the trap during heavy rain.

# **Survey Methodology** (Continued...)

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## Collect and record data

- Switch off the light before dawn to prevent moths overheating or escaping.
- Carefully remove moths from the egg boxes, using collecting pots if required.
- Identify and record species using an identification guide, taking photographs where helpful.
- Record the date the trap was switched on and the weather conditions for the night.
- Release moths gently near the trapping site once recording is complete.

# Vegetation Surveys

## Quadrats

### Objective

Quadrat sampling is a systematic method used to assess the presence of species within a specific area. This method is particularly effective for studying low-growing plant species, ground-dwelling invertebrates, or sessile organisms

### When to Survey

Quadrat surveys can be carried out throughout the year, but are most informative during spring and summer when plants are actively growing and easier to identify.

### Where to Set Up

Quadrats can be used across a wide range of habitats, including grassland, woodland, heathland, and coastal areas. Select locations that are representative of the wider site or that capture variation in vegetation structure and species abundance.

Avoid heavily disturbed areas unless disturbance is a specific focus of the survey.

# Commonly Recorded Species

See which species you may record in your quadrats

## Grassland

- **Buttercups**
- **Daisies**
- **Clover**
- **Meadow grass**
- **Ants**
- **Beetles**

## Woodland

- **Bluebells**
- **Ferns**
- **Leaf litter invertebrates** (e.g., millipedes, woodlice)

## Coastal

- **Marram grass**
- **Seaweeds**
- **Barnacles**
- **Coastal beetles**

# Equipment List

Everything you will need for your vegetation survey

## BioBox Equipment Required

- Quadrat frame
- Species identification guides (plants, invertebrates, coastal species)
- FSC Wildlife Pack, Seashores
- Plant Identification for Phase 1 Habitat Survey, Grassland and Marsh

## Other Materials Needed

- Recording sheet or notebook
- GPS device or site map for location tracking

# Health and Safety Considerations

## Personal Safety

- Obtain landowner permission before carrying out surveys. Wear sturdy footwear suitable for uneven ground.
- Take care around hazards such as brambles, thorns, and rocky terrain.
- Check for ticks after surveying, particularly in long grass or scrub.

## Wildlife Welfare

- Avoid surveying in areas with nesting birds or other protected wildlife.
- Minimise disturbance to wildlife while working within the survey area.

## Environmental Considerations

- Place quadrats carefully to avoid trampling sensitive vegetation.
- Inspect quadrat frames for sharp edges or damage before and after use.

# Survey Methodology

## 1 Place the quadrat

- Lay the quadrat frame flat on the ground at the chosen location.
- Ensure the frame is stable and positioned fully within the target area.

## 2 Survey within the quadrat

- Systematically examine the entire quadrat and identify all species present.
- Record each species on a recording sheet or notebook.
- If measuring abundance, record either:
  - The number of individuals present
  - The estimated  percentage cover of each species

## 3 Record environmental variables (optional)

- Note relevant environmental factors such as soil type, moisture, or overall vegetation cover.

## 4 Document observations

- Record the survey date, habitat type, and any notable or unusual findings.
- Take photographs to support records, particularly for difficult to identify species or features.

## 5 Repeat the survey

- Move to the next sampling point and repeat the process.
- Apply the same method at all locations to ensure results are consistent and comparable.

# Submitting your Records

Share your findings and help support nature recovery

## iRecord (preferred platform)

**What is iRecord?**

iRecord is a UK wide online platform for recording wildlife observations. Records submitted to iRecord are checked by experts and contribute to national biodiversity datasets used for research and conservation.

**Why use iRecord?**

Submitting records to iRecord:

- Improves understanding of species distributions and population trends
- Supports conservation planning and decision making
- Ensures records are reviewed and validated by specialists

## How to use iRecord

### 1. Create an account

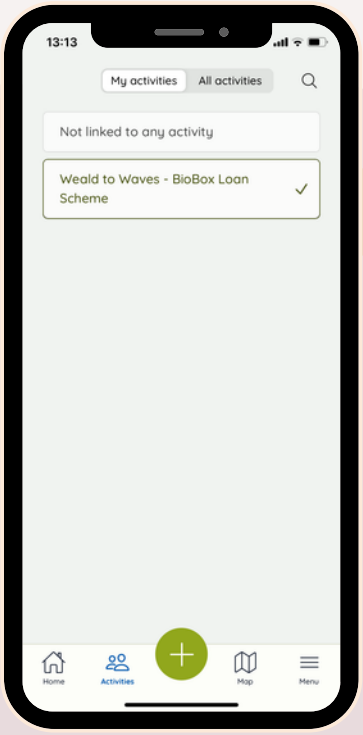
- Visit the iRecord website or download the iRecord app and create a free account.

### 2. Submit your records

- Log in and join the 'Weald to Waves - BioBox Loan Scheme' Activity so we can see your records as well as the Records Centre.
- You can enter single casual records or lists of species observations. You can also upload records from a spreadsheet.
- You should include the species name, date of observation, and location, using the built in map or a grid reference.
- Adding photos and extra details such as habitat or behaviour helps verifiers confirm your record.

### 3. Review and track your records

- Submitted records are checked by a network of expert verifiers
- You can view and manage your records through your account dashboard.



# Submitting your Records

Share your findings and help support nature recovery

## iNaturalist

**What is iNaturalist?**

iNaturalist is a global online platform for recording wildlife observations. Records submitted are verified by the community and contribute to research and conservation projects worldwide.

### How to use iNaturalist

**1. Create an account**

- Sign up at https://www.inaturalist.org/home or via the app.

**2. Add your observations**

- Join the Weald to Waves project: Weald to Waves - BioBox Loan Scheme
- Add single or multiple observations.
- Include species, date, and location using the map or a grid reference.
- Upload photos and add details about habitat or behaviour to help verification.

**3. Track your observations**

- Community members review your observations.
- Manage and view your records through your dashboard.

## Other ways to submit your observations

- **Weald to Waves recording sheet (provided in your BioBox)** – Use this as a guide or fill it in with your observations. Submit them yourself directly to iRecord or email a copy to info@wealdtowaves.co.uk and we will upload them for you.
- **Paper lists or your own spreadsheets (see next page for guidance)** – Submit yourself or email to info@wealdtowaves.co.uk, include as much detail as possible such as species, date, location, and any notes on habitat or behaviour.
- **Species specific survey forms (suggested under relevant activity in this manual) -** Submit yourself or email to info@wealdtowaves.co.uk.

# Submitting Records via Spreadsheets

Upload multiple records quickly and efficiently

You can upload multiple records to iRecord using a spreadsheet. This is particularly useful if you have completed several surveys or are submitting group results.

## What to include in your spreadsheet

### Required information

- Species name
- Grid reference (gridreferencefinder.com)
- Date of observation
- Recorder (the person who made the record)
- Life stage (for example adult, larva, or not recorded)

### Additional information (optional)

- Location name
- Abundance (number of individuals observed)
- Determiner (the person who identified the species, if different from the recorder)
- Habitat
- Comments

**Tip** Column headings do not need to exactly match iRecord. During the upload process, you will be able to match your column headings to the correct iRecord fields.

## Example layout

| Species | Site name | Grid reference | Date | Recorder name | Sex | Life stage | Number seen | Comments |
|---|---|---|---|---|---|---|---|---|
| *Robin* | *Garden, Hove* | *TQ315045* | *12/4/2025* | *Mr Weald* | *Male* | *Adult* | *1* | *Feeding on patio* |
| | | | | | | | | |

# Additional Resources

Useful identification tools and recording resources

More information on monitoring wildlife can be found in the Sussex Wildlife Trust booklet included in each BioBox!

## Identification apps

Note: AI identification tools are useful but not always accurate. Always treat results as a guide and confirm identifications using reference photos, field guides, or expert advice.

### iNaturalist

A global platform to upload photos of wildlife for identification by a community of experts and enthusiasts. Great for beginners.

- Features: Photo uploads, AI-assisted species ID, community input.

### Seek by iNaturalist

A camera based app that provides instant identification of plants, animals, and fungi. Particularly useful for quick field use.

- Key features: Offline use, instant feedback, achievement badges.

### ObsIdentify

This app gives a percentage accuracy rating to help provide confidence in your record. It also draws from a European species database, meaning closer matches to our species in the UK. Good for identifying plants, large invertebrates such as moths, and fungi.

- Features: Offline functionality, percentage accuracy rating, badges for discoveries.

# Identification Websites

### RSPB Bird Identifier
Comprehensive tool for identifying UK birds by appearance, behaviour, or habitat.
**https://www.rspb.org.uk/birds-and-wildlife/identifying-birds**

### BTO BirdFacts
Detailed species accounts, including identification, ecology, and seasonal activity for UK birds.
**https://www.bto.org/learn/about-birds/birdfacts**

### UK Butterfly Monitoring Scheme
Identification resources and guidance for butterfly recording in the UK.
**www.ukbms.org**

### British Dragonfly Society
Identification guides and information on dragonflies and damselflies, useful for pond surveys.
**www.british-dragonflies.org.uk**

### Field Studies Council (FSC)
High quality identification guides and survey advice covering plants, invertebrates, mammals, birds, and freshwater species.
**www.field-studies-council.org**

### Mammal Society
Species guides, signs and tracks, and advice for mammal surveys including camera trapping and footprint tunnels.
**www.mammal.org.uk**

### Bat Conservation Trust
Guidance on bat surveys, species identification, and use of bat detectors.
**www.bats.org.uk**

### Field Studies Council (FSC) ID Resources
Searchable collection of species identification guides, field keys, and survey resources covering a wide range of UK wildlife, from beginner to advanced level.
**www.fscbiodiversity.uk/idsignpost**

# Conservation & Citizen Science Resources

### Froglife
Resources for amphibian and reptile surveys, including identification guides and survey techniques.
**www.froglife.org**

### Butterfly Conservation
Guidance on butterfly and moth identification, recording, and monitoring.
**www.butterfly-conservation.org**

### Plantlife
Information and guides for identifying wildflowers and plants in the UK, including grassland and woodland species.
**www.plantlife.org.uk**

### People's Trust for Endangered Species (PTES)
Survey guidance and citizen science projects focusing on mammals and woodland species.
**www.ptes.org**

### Sussex Biodiversity Record Centre
Local wildlife recording and biodiversity data for Sussex, supporting conservation planning and research.
**www.sxbrc.org.uk**

### National Biodiversity Network (NBN) National BioBlitz Network
Information and support for running and taking part in BioBlitz events, with guidance, resources, and examples to help people record and explore local wildlife.
**https://www.bnhc.org.uk/bioblitz/national-bioblitz-network**