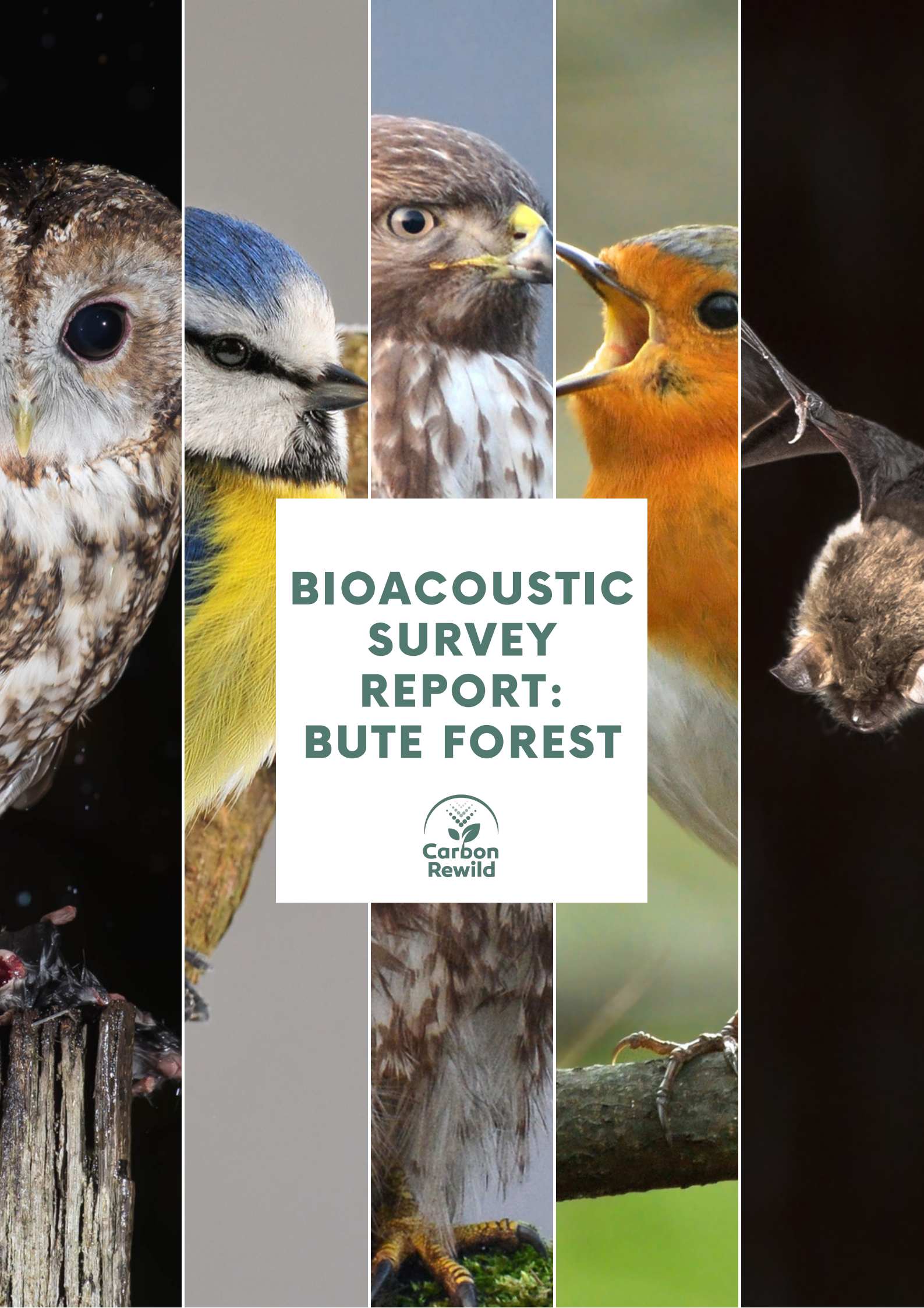


BIOACOUSTIC SURVEY REPORT: BUTE FOREST

Carbon Rewild

SURVEY OVERVIEW

Biodiversity can be defined as the variety of plant and animal life in a particular habitat, a high level of which is usually considered to be important and desirable. We define Biodiversity during this report as species richness, the number of distinct species counted in the survey area.

The aims of the survey is to identify bird and bat species and highlight those of conservation importance, whilst also providing a wildlife baseline against which future bioacoustic surveys can be measured against. The methodology is designed to be easily replicated so that future surveys can be repeated.

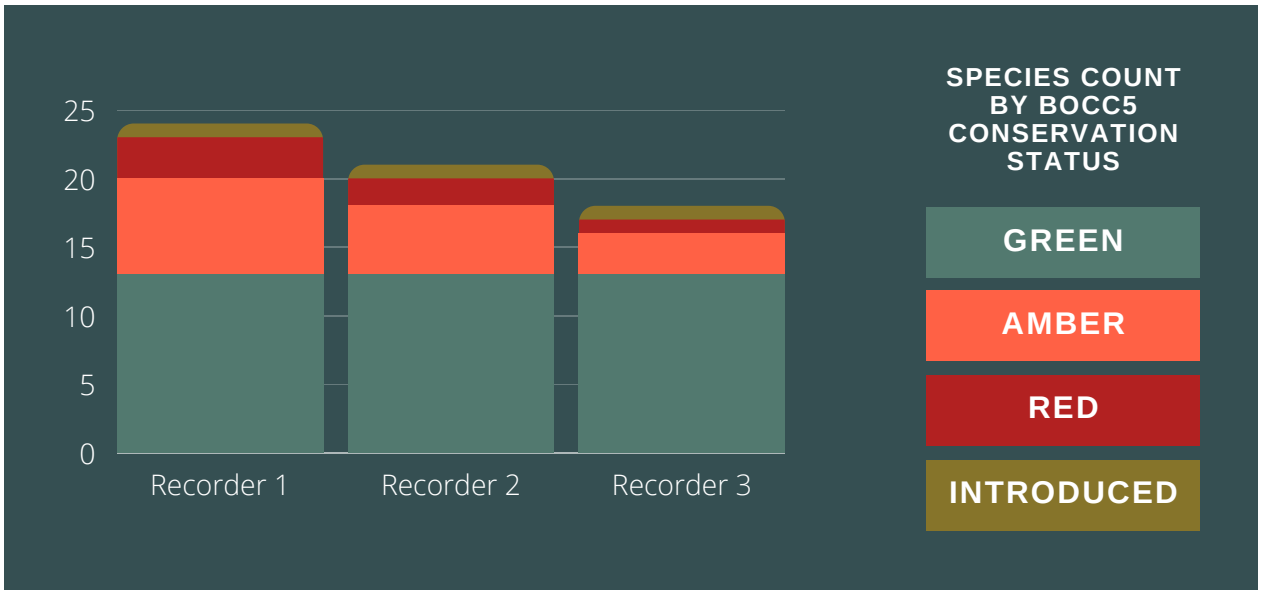
- Bats: acoustic monitoring at ultrasonic frequencies were used to identify bat species through their echolocation calls.
- Birds: acoustic monitoring was also used to identify bird species through their bird song and calls.

The survey took place between December 6th 2022 - January 4th 2023, recording at the same time intervals every day during the survey period. 3 recording devices were deployed across the survey sites.

During the survey we identified 29 species, several of which can be considered key indicator species whose presence or abundance can reflect the health of the ecosystem. Species of interest that were identified include: Redwing, Curlew, Lesser Redpoll. No bats were detected through this survey, which is to be expected at this time of year when bat activity is extremely low.

SURVEY OVERVIEW

NUMBER OF SPECIES IDENTIFIED PER RECORDING DEVICE



SURVEY DASHBOARD

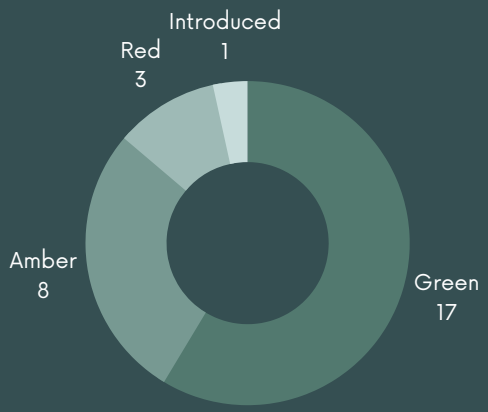
BIRDS OVERVIEW (ALL SURVEY SITES)

MOST FREQUENTLY IDENTIFIED BIRD SPECIES

4036 CALLS FROM IDENTIFIED BIRD SPECIES

29 BIRD SPECIES

CONSERVATION STATUS OF BIRDS IDENTIFIED



BIRDS OVERVIEW

BIRDS OVERVIEW

The bird survey aims are to identify bird species present in the land, highlighting those of legal and/or conservation importance, and providing a baseline of species diversity, from which future bird diversity and populations can be measured against. The survey can be easily replicated by monitoring from the same location. Statistically significant Changes in identification frequency can be used as a proxy for changes in population.

A full list of species identified across all survey sites can be found below:

Species	Scientific Name	Identification Frequency	Conservation Status (BoCC5)
longtailed tit	aegithalos caudatus	1129	green
goldcrest	regulus regulus	650	green
common raven	corvus corax	447	green
eurasian treecreeper	certhia familiaris	407	green
eurasian wren	troglodytes troglodytes	398	amber
redwing	turdus iliacus	176	amber
common blackbird	turdus merula	150	green
european robin	erithacus rubecula	132	green
coal tit	periparus ater	97	green
eurasian blue tit	cyanistes caeruleus	88	green
carrion crow	corvus corone	71	green
tawny owl	strix aluco	49	amber
great tit	parus major	45	green
canada goose	branta canadensis	38	introduced
hooded crow	corvus cornix	35	green
eurasian curlew	numenius arquata	23	red
great spotted woodpecker	dendrocopos major	21	green
common chaffinch	fringilla coelebs	12	green
greylag goose	anser anser	12	amber
dunnock	prunella modularis	10	amber
european herring gull	larus argentatus	10	red
common buzzard	buteo buteo	8	green
common wood pigeon	columba palumbus	7	amber
rook	corvus frugilegus	5	amber
red crossbill	loxia curvirostra	5	green
great blackbacked gull	larus marinus	3	amber
lesser redpoll	acanthis cabaret	3	red
eurasian siskin	spinus spinus	3	green
eurasian jay	garrulus glandarius	2	green

BIRDS: SPECIES FOCUS

British bird populations have experienced severe decline in recent decades, with many species facing increasing risks such as habitat loss. The Red List, which includes our most endangered species, has grown to 70 species (nearly double the amount originally included on the list in 1996).

A total 29 species were identified during the survey period. Several of the identified species identified are of conservation importance and have experienced population loss in recent years, with three species (Curlew, Herring Gull, Lesser Redpoll) on the red list species of conservation concern (BoCC5). Healthy landscapes can support bird populations, as many rely on insect and soil invertebrates as their primary food source, and ample habitat such as scrub and hedgerow can provide safety and nesting for many species. You may also choose to support certain bird species with nest boxes, which need to be sized and place appropriately depending on the bird species you intend to house.

The **Curlew** is the UK's largest wading bird, and our breeding population of Eurasian curlews is of national importance, being estimated to represent more than 30 percent of the west European population. Curlews breed on a range of habitats, but primarily favour grasslands, moorlands and bogs. The intensification of farming on these lands, as well as drainage and reseeding, is likely to have been important in causing past declines in breeding populations, as has afforestation of moorlands. Together, these activities are having a huge impact on curlew populations.

The **Herring gull** is a common sight of our seaside towns, particularly during the breeding season. In winter it can be found on farmland, wetland and coastal habitats, as well as urban settings throughout the UK. Despite their prevalence in urban areas, their population has seen significant decline of 60% since 1986, placing them on the red list of conservation concern (BoCC5). There are expected to be a number of reasons for their decline, believed to include disease and reduced available food supply.

IN 2019 THE UK WOODLAND BIRD INDEX WAS 25% BELOW ITS 1970 VALUE*

IN 2019, THE UK FARMLAND BIRD INDEX WAS 45% OF ITS 1970 VALUE*

* Monitoring of scarce and rare breeding birds by the Statutory Conservation Agency and RSPB Annual Breeding Bird Scheme (SCARABBS) and the Rare Breeding Birds Panel (from 1970 to 2017)

BIRDS: SPECIES FOCUS

The **Lesser redpoll** is a small finch of mixed woodland, birch scrub and wet woodland. It spends much of its time feeding on seeds and invertebrates in tall trees. It has a small beak adept at handling fine seeds, favouring Birch, Alder and young conifers. Birch thrives in young woodland, and the felling of trees during the Second World War presented ideal conditions for birch to flourish in the post-war period. With lots of young conifers also planted, Lesser redpoll numbers boomed until the mid-1970s. However, the intensification of agriculture saw certain seeds becoming scarcer, and the makeup of forests changed, leading to a decline in Lesser Redpoll survival rates.

APPENDIX A: SPECIES RICHNESS PER DEVICE

Recording Device 1

What3Words Location: smarting.exacted.bounded

Bird Species:

Species	Identification Frequency
longtailed tit	706
goldcrest	379
common raven	317
eurasian treecreeper	278
eurasian wren	171
common blackbird	137
redwing	132
carrion crow	71
european robin	45
hooded crow	34
great tit	30
eurasian blue tit	21
eurasian curlew	19
tawny owl	17
coal tit	17
canada goose	11
common chaffinch	9
common buzzard	7
common wood pigeon	7
european herring gull	7
rook	5
great blackbacked gull	3
greylag goose	3
lesser redpoll	3

APPENDIX A: SPECIES RICHNESS PER DEVICE

Recording Device 2

What3Words Location: brink.jolly.atomic

Bird Species:

Species	Identification Frequency
longtailed tit	189
eurasian wren	125
common raven	62
eurasian treecreeper	54
goldcrest	50
coal tit	46
tawny owl	22
canada goose	21
eurasian blue tit	20
great spotted woodpecker	15
european robin	11
dunnock	10
greylag goose	9
redwing	8
great tit	7
common blackbird	4
common chaffinch	3
european herring gull	3
hooded crow	1
eurasian curlew	1
common buzzard	1

APPENDIX A: SPECIES RICHNESS PER DEVICE

Recording Device 3

What3Words Location: waking.cooks.chatters

Bird Species:

Species	Identification Frequency
longtailed tit	234
goldcrest	221
eurasian wren	102
european robin	76
eurasian treecreeper	75
common raven	68
eurasian blue tit	47
redwing	36
coal tit	34
tawny owl	10
common blackbird	9
great tit	8
great spotted woodpecker	6
canada goose	6
red crossbill	5
eurasian curlew	3
eurasian siskin	3
eurasian jay	2

APPENDIX B: SURVEY METHODOLOGY

ACOUSTIC MONITORING: BIRD MONITORING

Bird identification can often be made by birdsong alone, and using passive acoustic monitoring equipment can be a very powerful way to survey a landscape over an extended period of time. By harnessing the latest software, we can easily process a large number of recordings as a screening technique to establish the species present, before further statistical analysis and human verification of recordings to finalise the results.

Audio Data is recorded at intervals 22 hours a day (there is a 2 hour nighttime window when ultrasonic recording is taking place).

ACOUSTIC MONITORING: BAT MONITORING

Using acoustic monitoring devices, recording at high frequencies, we can detect species through analysis of the signals recorded. There are limitations to this method, as unusual environments or locations can cause variations in the signals produced. In some environments, some bat species can appear similar as they adapt their signal to suit the structure of the environment, and misidentification can occur.

However, key species can be identified, including many indicator species. Due to their reliance on significant insect populations, their population can reflect the health of the local environment. There are several indicator bat species in the UK, including lesser horseshoe bat, common pipistrelle, soprano pipistrelle, Daubenton's bat, Natterer's bat, serotine and noctule.

During the survey period, devices are used to record at ultrasonic frequencies at intervals between 00:00 – 02:00 each night.