

Research Report 2014



Compiled by:
Robert Jones Parry MSc MCIEEM and Dr Lizzie Wilberforce
Conservation Managers

The Wildlife Trust of South and West Wales

The Nature Centre

Fountain Road

Tondu

Bridgend CF32 0EH

01656 724100

r.parry@welshwildlife.org / l.wilberforce@welshwildlife.org

Further details of any of the studies detailed in this report can be gained by contacting the authors or the named contacts for individual projects.



South and West Wales
De a Gorllewin Cymru

Contents

.....	1
Harvest Mouse Surveys	6
American Mink distribution in Wales	6
Development of new monitoring programmes at Carmel NNR.....	6
Dormice in Ceredigion	7
Bat surveys on Skomer	7
Bat surveys on Skokholm	8
The ecology of the Marsh Pea at Ffrwd Farm Mire nature reserve.....	8
Pembrokeshire Marsh Fritillary survey 2014.....	9
Wetlands of the Teifi Marshes- the implications of sea level rise for ecosystem conservation	9
The distribution, population size and growth of Turkey Oak (<i>Quercus cerris</i>) at Taf Fechan LNR	10
Habitat preferences of winter bird communities	10
Differences in benthic macroinvertebrate communities among meso-habitats in streams	10
Ecological relationships in woodland communities	11
Puffinosis in Manx Shearwaters on Skomer	11
Little Owl and Short-eared Owl diet analysis on Skomer.....	11
A survey of burying beetles on Skomer	12
Establishing long-term population studies of Storm Petrels on Skokholm and Skomer	12
Archaeology on Skomer Island in 2014.....	13
Soil analyses and vegetation management at Teifi marshes nature reserve	14
The Skomer Vole 2001-2013	14
Impact of Great Black-backed Gull predation on Manx Shearwaters on Skokholm	14
How do Lesser Black-backed Gulls on Skokholm use their environment?	15
Parc Slip freshwater invertebrate monitoring.....	15
A review of Coed y Bedw Pied Flycatcher monitoring.....	16
Lapwing at Parc Slip	16
Dormice at Brynna Woods and Llanharan Marsh	16
Surveying the fungi of Skokholm Island in April 2014	17
An investigation into the fungal communities within the roots of <i>Succisa pratensis</i>	17
An investigation into the use of Rotarod samplers to detect <i>Cryptomyces maximus</i>	18
Leaf litter breakdown and invertebrate colonisation of <i>Alnus glutinosa</i> (Common Alder) and <i>Fagus sylvatica</i> (Beech) in a small lowland river	18
Giant lacewings in Coed y Bedw nature reserve	19

Reed Bunting colour ringing RAS project at the Teifi Marshes.....	20
Teifi Marshes Constant Effort Site, bird ringing project.....	20
Cardigan Bay Marine Wildlife Centre ShoreFin Project	21
Vessel-based marine megafauna surveys in Cardigan Bay.....	22
Shore-based marine mammal surveys in Cardigan Bay.....	22
Cardigan Bay Bottlenose Dolphin (<i>Tursiops truncates</i>) photo-identification catalogue	23
Future Fisheries – Living Seas.....	23
Atlantic Grey Seal (<i>Halichoerus grypus</i>) photo-identification catalogue.....	24
Recent Publications relating to WTSWW nature reserves or projects.....	25

Introduction

The Wildlife Trust of South and West Wales and the wider Wildlife Trusts movement have always endeavoured both to support and encourage research into the natural environment and also to base our own operational decisions upon such work, in order that our actions are appropriate and effective, and defensible in light of the latest research available.

This report summarises all research work undertaken in partnership with or hosted by WTSWW, primarily on its nature reserves, during 2014. These studies are delivered by a huge range of individuals varying from university students and academics, to interested individuals, and in some cases, contracted companies. The report does not cover routine monitoring, but instead summarises original survey or research work that captures new information. Some of these studies are directly relevant to the management of our own estate and are site-specific. Others address hypotheses relevant to the wider movement and include a number university studies generating original research that is published and of global significance.

In all cases we are indebted to the many partners and funders for their contribution of time, skills and financial support.

Harvest Mouse Surveys

County: Pembrokeshire, Ceredigion, Carmarthenshire

Researcher: Aline Denton

Partner organisation: The Vincent Wildlife Trust, MISE Project

WTSWW contact: Rebecca Killa, Nathan Walton, Howard Jones, Em Foot

Summary

The MISE project has supported WTSWW staff and volunteers with Harvest Mouse surveys on a number of WTSWW sites from 2013. This has involved a mixture of nest searches and a novel bait pot method developed by MISE. Ten bait pots were used in each survey area, spaced 10 m apart.

To date, Harvest Mice have been identified from DNA in droppings at Ffrwd Farm Mire only. A nest search training event for volunteers was also organised at Ffrwd Farm Mire in Dec 2014. 10 harvest mouse nests were found.

American Mink distribution in Wales

County: All counties

Researcher: Lorna Baggett, WTSWW

Partner organisation: Contracted to Natural Resources Wales

WTSWW contact: Rob Parry, Vaughn Matthews

Summary

The American Mink Control Strategy for Wales recommended that an effort be made to collate the existing data on Mink control effort in Wales. This would benefit Water Vole conservation by helping better target resources to those areas most in need of Mink control, including practice guidance and support, as well as helping to inform American Mink control schemes and funding applications. Better long-term Mink management decisions could be made if catchment-scale distribution of Mink control was understood, which may also enable partnerships to form. This study therefore aimed to identify the distribution of American Mink in Wales, and the areas where Mink control and trapping is being carried out. The study revealed that invasive American Mink are distributed across all of Wales. Records appear along some of the rivers in Wales, and in 13 river catchments, although some have fewer records than others. The majority of records collated in this study were live sightings. Field signs were less reported than live sightings, and trapping effort appears limited. A full copy of the report is available.

Development of new monitoring programmes at Carmel NNR

County: Carmarthenshire

Researcher: Dr. Deborah Sazer - ecoleg.sazer ecology

Funder: CWM Environmental

WTSWW contact: Rebecca Killa

Summary

Carmel is a new WTSWW reserve, which was previously managed by The Grasslands Trust.

Quadrat surveys were undertaken by Dr Deborah Sazer in 2010/2011, then working as The Grasslands Trust's Ecologist, as part of the CWM Environmental-funded Beeline Project. After The Grasslands Trust went into liquidation, WTSWW acquired the site on lease from Natural Resources Wales, and the remaining grant was transferred. The results were analysed to determine the effect of four years of conservation management, and to guide future management. A new 'rapid assessment' monitoring programme was established on Carmel's unimproved neutral and calcareous grasslands, rhos pasture and woodlands, following baseline surveys in 2014.

Dormice in Ceredigion

County: Ceredigion

Researcher: Aline Denton / Brian Matthews (licence-holder)

Partner organisation: Vincent Wildlife Trust, MISE project

WTSWW contact: Em Foot

Summary

Dormice have an extremely restricted distribution in Ceredigion. Em Foot worked with Jenny MacPherson (VWT) to install Dormouse boxes at Cwm Clettwr, funded by the MISE project. Results of Dormouse monitoring during 2014 revealed a good number of animals, with a peak of 21 individuals being recorded during the box check on 20 October.

The boxes will continue to be monitored through the PTES National Dormouse box Monitoring Programme.

Bat surveys on Skomer

County: Pembrokeshire

Researcher: Rachel Taylor, Matt Hobbs

Organisation: BSG Ecology

WTSWW contact: Ed Stubbings, Bee Büche

Summary

An automated bat detector was deployed on Skomer in May 2014 as part of BSG Ecology's ongoing bat research. The key aim of the research was to contribute to an ongoing BSG Ecology study into bat migration in the UK, with a particular focus on providing evidence of seasonal changes in bat activity that may suggest movements of bats between the UK and Ireland and between the mainland and offshore islands. An additional aim was to compile a bat species list for Skomer and two other Pembrokeshire islands to inform the conservation of these important protected areas.

The detector recorded between mid-May and mid-October. A total of 5930 bat calls were recorded over the survey period with an average of 49 bat passes recorded per night. A minimum of nine species of bat were recorded: Common Pipistrelle, Soprano Pipistrelle, Nathusius' Pipistrelle, Noctule, Leisler's Bat, Myotis sp., Long-eared Bat sp., Barbastelle,

and Greater Horseshoe Bat. The data collected suggests that the islands, which were originally considered to be relatively unsuitable for bats due to a lack of foraging and roosting habitat, shelter and their distance from the mainland, are regularly used by a variety of bat species. The highest activity rate was recorded for Common Pipistrelle, an average of 30.4 B/n with 62% of the overall recorded activity attributable to this species, suggesting strongly that there is a roost close to the detector location. The time of night that some of the Soprano Pipistrelle and Long-eared Bat passes were recorded suggests that these species may also roost on the island. One of the more unexpected results was the use of the islands by two species, Greater Horseshoe and Barbastelle, that have not, to our knowledge, been recorded regularly crossing the open sea before. Another was a September peak in Leisler's Bat activity, which may indicate migratory movement by this species. The full report, which compares bat activity on Skomer to Skokholm and Ramsey Islands, and discusses the potential of migration occurring is available at: <http://ow.ly/HW6VJ>

Bat surveys on Skokholm

County: Pembrokeshire

Researcher: Rachel Taylor, Matt Hobbs

Organisation: BSG Ecology

WTSWW contact: Richard Brown, Giselle Eagle

Summary

These data were generated as part of the same study listed above with a combined report available at <http://ow.ly/HW6VJ>.

A minimum of seven species were recorded on Skokholm Island, these were: Common Pipistrelle; Soprano Pipistrelle; Nathusius' Pipistrelle; Noctule; Leisler's Bat; *Myotis* sp. and Greater Horseshoe bat. Across the survey period a total of 1,034 bat passes were recorded. The highest activity rate was recorded from Noctule, an average of 9.3 B/n with around 60% of the overall recorded activity being attributed to this species. The second highest activity levels were passes that had parameters overlapping between Noctule and Leisler's Bat and therefore could have been either species; these passes were recorded at a rate of 5.9 B/n and accounted for 38% of the bats passes recorded. Overall a total of 98% of bat passes were from bats of the *Nyctalus* genus. Activity rates of all other species were low, but a relatively high number of species were recorded. Greater Horseshoe Bat passes were recorded three times in September, Nathusius' Pipistrelle was recorded once in mid-September as was a *Myotis* sp. in mid-October, with Common and Soprano Pipistrelle each recorded twice between mid-August and mid-September.

The ecology of the Marsh Pea at Ffrwd Farm Mire nature reserve

County: Carmarthenshire

Researcher: Sophie Hocking

Partner organisation: Swansea University

WTSWW contact: Rebecca Killa

Summary

This was a BSc project investigating the ecology of the Marsh Pea, *Lathyrus palustris* at Ffrwd Farm Mire, Pembrey. 100 random quadrats were sampled in a 1.3ha portion of the nature reserve. The aims were to map the distribution of *L. palustris* at the nature reserve, determine how its distribution has changed since the last study conducted in 1993, and determine the environmental factors affecting its distribution. *L. palustris* had a frequency of 54% and a mean percent (%) cover of 5.56%. Soil moisture and conductivity were the factors most affecting the distribution of *L. palustris*. Additionally Common Reed, *Phragmites australis*, Skullcap, *Scutellaria galericulata* and Water Mint, *Mentha aquatica* are most associated with *L. palustris*.

Pembrokeshire Marsh Fritillary survey 2014

County: Pembrokeshire

Researcher: Pembrokeshire Marsh Fritillary Recording Group

Partner organisation: WTSWW is a member of the above group

WTSWW contact: Nathan Walton

Summary

In June 1997, the Pembrokeshire Marsh Fritillary Recording Group (PMFRG) was formed to repeat the survey carried out by Annie Poole in 1995-96. The group includes WTSWW, Natural Resources Wales (NRW), Pembrokeshire Coast National Park, National Trust and Pembrokeshire County Council. The group aims to monitor the distribution of Marsh Fritillaries on all known sites annually by searching for both adult butterflies and larval webs. Such annual surveillance has enabled the group to monitor the Marsh Fritillary and its habitat over the county over a period of time. The group is co-ordinated by Jon Hudson, and Stephen Coker has produced the full 2014 report, which is publically available. The results of the group's surveying effort is as follows, with equivalent 2013 results in brackets for comparison. A total of 176 spring webs (none), 770 adults (1022) and 3516 autumn webs (2417) were recorded during the year, of which 232 adults (999) and 2271 autumn webs (1521) came from Castlemartin. Surveys of adults flying were undertaken by 8(8) recorders whilst 10(8) people found webs. The size of the population in Pembrokeshire is probably at its highest level since records began. Many of the outlying population are not part of a viable sustainable population. None of the populations have sufficient connectivity to ensure continuous exchange of individuals between sites within each population.

Wetlands of the Teifi Marshes- the implications of sea level rise for ecosystem conservation

County: Pembrokeshire, Ceredigion

Researcher: SE Grenfell, RM Callaway, CM Bertelli, AF Mendzil & I Tew

Partner organisation: Swansea University (SEACAMS)

WTSWW contact: Nathan Walton, Lizzie Wilberforce

Summary

The final report for this project was published in 2014 and is now available. The report concluded that rising sea levels will result in an irrevocable change in vegetation communities; it is likely that in the long term, the Teifi Marshes will be less diverse and increasingly dominated by reedbeds and tidal mudflats. While there is potential in this case

for more diverse communities to occur further upstream, it is unknown as to whether it is biologically possible within the time scale involved (i.e. ~ 200 years). Usually monospecific reedbeds allow carbon capture through peat production and both reedbeds and mudflats provide valuable habitat for a variety of animals including bird species. Model results suggest that change may be sudden rather than gradual due to the elevation properties of the site. In about 150 years, there is a sudden jump in the proportion of the wetland that is inundated by every flood tide. Rising sea levels associated with climate change will almost certainly result in a loss of biodiversity in the Teifi Marshes, although changes may not be visible in the next century.

The distribution, population size and growth of Turkey Oak (*Quercus cerris*) at Taf Fechan LNR

County: Merthyr Tydfil
Researcher: Lisa Handscomb
Partner organisation: University of South Wales
WTSWW contact: Carys Solman

Summary

This MSc project assessed the effects of Turkey oak (*Quercus cerris*) on the ecology of our semi-natural woodlands. Plotting the distribution of the Turkey oak also aids in the development of a management plan these non-native trees.

Habitat preferences of winter bird communities

County: Glamorgan
Researcher: Jenna James (undergraduate project)
Partner organisation: Cardiff University
WTSWW contact: Rob Parry, Vaughn Matthews

Summary

Simple bird surveys were carried out during January and February to assess the winter bird communities across four WTSWW reserves: Pwll Waen Cynon, Brynna Woods, Taf Fechan and Coed y Bedw. Standard point count methodology was used, allowing diversity and composition to be examined, and – via distance sampling – estimates of density to be made. In addition, simple habitat measurements were made at each location (e.g. sward and canopy height, tree density). Bird communities will be compared within and among the four reserves, and habitat preferences assessed.

Differences in benthic macroinvertebrate communities among meso-habitats in streams

County: Glamorgan
Researcher: Jack Rogers, Kieran O'Malley (undergraduate project)
Partner organisation: Cardiff University
WTSWW contact: Rob Parry, Vaughn Matthews

Two undergraduate research projects comparing the benthic macroinvertebrate communities in contrasting meso-habitats (mid-channel pools, riffles and margin habitats) in

streams/rivers. Watercourses sampled on four reserves (Pwll Waun Cynon, Brynna Woods, Taf Fechan, Coed y Bedw), with samples collected from small areas (0.1m²) using standardised kick sampling. Macroinvertebrate communities will be compared among the meso-habitats in terms of total abundance, biomass, community structure and ecological traits (e.g. functional feeding guilds, such as shredders and predators). This will indicate differences in the ecological functioning of different meso-habitats and may act to confirm the conservation importance of habitat diversity within watercourses.

Ecological relationships in woodland communities

County: Ceredigion

Researcher: Dr Dave Powell and students

Partner organisation: Aberystwyth University

WTSWW contact: Em Foot

Summary

Study based in Cwm Clettwr nature reserve. Vegetation samples along the pathway using random quadrats along transect line, recording all the plants found. Tree abundance, around a random point, for statistical analysis. Data analysed to look at the relationship between soil types, management and woodland communities.

Puffinosis in Manx Shearwaters on Skomer

County: Pembrokeshire

Researcher: Sophie Medlock, supervisor Dr Matt Wood

Partner organisation: University of Gloucestershire

WTSWW contact: Ed Stubbings, Bee Büche

Summary

This project is ongoing and not yet at a reporting stage.

The main aim of this dissertation research project is to measure body temperature in relation to puffinosis (a disease of Manx Shearwaters on Skomer) using a thermal imaging camera. By monitoring the change in temperature with the results of whether or not each bird developed puffinosis throughout the fledging season, we aim to see any temperature change associated with the physical symptoms of puffinosis, and the severity of those symptoms. For example, birds with higher temperatures may develop other symptoms such as conjunctivitis or spasticity. In summary, this project aims to develop the understanding of puffinosis, by adding a physiological measure of a bird's internal state to complement the approaches of other studies.

Little Owl and Short-eared Owl diet analysis on Skomer

County: Pembrokeshire

Researcher: Emily Compton, supervisor Dr Matt Wood

Partner organisation: University of Gloucestershire

WTSWW contact: Ed Stubbings, Bee Büche

Summary

This project is ongoing and not yet at a reporting stage. It builds on the work undertaken in 2013 by Elle Daley.

The study collected pellets of Little Owls and Short-eared Owls across the island and dissected them to look at their diet. By looking at the pellet content, it will be possible to calculate the biomass of each species they are consuming. The study will use data from previous years to see how their diet may have changed. This will provide details on population dynamics, conservation and island management. This may provide information on the predation of Storm Petrels on the island and their population.

A survey of burying beetles on Skomer

County: Pembrokeshire

Researcher: Chloe Dix, Alfredo Attisano, Prof. Rebecca Kilner & Dr Matt Wood

Partner organisation: University of Gloucestershire

WTSWW contact: Ed Stubbings, Bee Büche

Summary

This project is ongoing and not yet at a reporting stage.

Burying beetles (genus *Nicrophorus*) are members of the Silphidae family (carrion beetles). They provide a key ecosystem service by decomposing the dead – feeding and breeding on the carcasses of small mammals and birds. Typically, they have black and red coloured wing cases, and large antennae to detect the smell of decomposing flesh from a long distance. This project was established to survey Skomer for the presence of *Nicrophorus* spp. burying beetles, identify and count the species present, record their location and collect specimens for further analysis.

Establishing long-term population studies of Storm Petrels on Skokholm and Skomer

County: Pembrokeshire

Researcher: Dr Rob Thomas & Dr Matt Wood

Partner organisation: Cardiff University, University of Gloucestershire

WTSWW contact: Ed Stubbings, Bee Büche, Richard Brown, Giselle Eagle

Summary

This project is ongoing and not yet at a reporting stage.

This project aims to establish a long-term study of the population dynamics of European Storm Petrels (1) using thermal imaging technology to estimate breeding productivity and (2) using capture-recapture study to estimate adult survival.

If the study is successful in revealing the fundamental ecology of Storm Petrels, these findings would have wider benefits, including the potential to include this species in the monitoring of seabird populations in the UK and Ireland (JNCC Seabird Monitoring Programme). Such monitoring has been important in identifying the effects of climate change and fisheries exploitation on marine ecosystems.

Reconnecting our South Wales Water Voles

County: Ceredigion and Carmarthenshire

Researcher: Nia Stephens (WTSWW)

Partner organisation: Funded by Welsh Government's Resilient Ecosystems Fund, through Natural Resources Wales

WTSWW Contact: Nia Stephens

Summary

WTSWW worked with private landowners in Ceredigion and Carmarthenshire to gain a better understanding of the distribution of Water Voles in South and West Wales. Between April and October 2014, targeting areas with potentially the best Water Vole habitat; 64 sites, covering a total of 2655.5 hectares were surveyed. Of these 64 sites Water Voles were present at 27 and overall 48 records of Water Voles were found. Areas were identified where habitat management work could be undertaken to improve habitat quality and connectivity for Water Vole should funding become available in future. A full report is available.

Archaeology on Skomer Island in 2014

County: Pembrokeshire

Researcher: Toby Driver, Louise Barker, Bob Johnston, Oliver Davis

Partner organisation: Royal Commission on the Ancient and Historical Monuments of Wales (TD & LB), in collaboration with the University of Sheffield (BJ) and Cardiff University (OD).

WTSWW contact: Ed Stubbings, Bee Büche

Summary

A collaborative research project between the Royal Commission, University of Sheffield and Cardiff University completed a third season of fieldwork on Skomer Island between 1st-5th April 2014. This included the historic first modern excavation in the island's history, exploring a mound of burnt stone alongside an Iron Age settlement. Previous geophysical (magnetic) survey was also successfully extended across the unscheduled post medieval fields in the centre of the island to attempt to identify buried prehistoric remains of walls and houses.

A small (6.06m x 1m) evaluation trench was opened across a large cooking mound adjoining and to the south of hut group 8 (SM 7242 0990), in the north of the island, running from the external wall of the hut down to the outer edge of the mound. The excavations yielded the first scientific dates ever obtained for the settlements on Skomer Island. Charcoal of probable blackthorn derived from a buried land surface provided a radiocarbon date of 751-408 cal. BC (SUERC 54181 at 95% probability), Early Iron Age. A single cattle tooth excavated from within the burnt mound provided a radiocarbon date of 161 cal. BC – 51 cal AD (SUERC 55129 at 95% probability), Late Iron Age, for the main period of activity on site. The settlement activity on this part of northern Skomer is therefore firmly dated to the Later Iron Age.

Online resources can be found at:

<http://www.coflein.gov.uk/en/site/420196/details/SKOMER+ISLAND+HUT+GROUP+8/>

Soil analyses and vegetation management at Teifi marshes nature reserve

County: Ceredigion, Pembrokeshire

Researcher: Oliver Amy, Oliver Glenister, Elen Angharad Hall, Stefanie Carter, Liam George

Partner organisation: Aberystwyth University (Dr John Scullion)

WTSWW contact: Howard Jones, Nathan Walton

Summary

Meadow management assessment and recommendations based on soil analyses, report available.

The Skomer Vole 2001-2013

County: Pembrokeshire

Researcher: Dr Michael Loughran

WTSWW contact: Ed Stubbings, Bee Büche, Lizzie Wilberforce

Summary

The Skomer Vole (*Myodes glareolus skomerensis*) is a distinct island race that has recently evolved after probably accidental introduction to the island. Despite being geographically isolated from the mainland it is not genetically isolated and is able to interbreed with the bank vole producing fertile hybrids. It is larger than the mainland Bank Vole (*Myodes glareolus*), has a distinct pelage and the shape of the nasal passages are unique. The current work has focused on monitoring population dynamics and demography of Skomer Voles and has investigated the social organisation and associated changes through the breeding season of female Skomer Voles using intensive trapping and radiotracking. A full report is available.

Impact of Great Black-backed Gull predation on Manx Shearwaters on Skokholm

County: Pembrokeshire

Researcher: Richard Brown and Giselle Eagle, Skokholm volunteers

WTSWW contact: Richard Brown and Giselle Eagle

Summary

In the period between 1957 and 1997 the number of dead Manx Shearwaters located on Skokholm was recorded in the daily census log. The corpses were either stored or thrown in to the sea to ensure that the same birds were not counted more than once. The practice was stopped in 1997 as it was felt that the removal of the corpses would be impacting the specialist community of creatures evolved to exploit this food source. However, with a Great Black-backed Gull population more than twice the size it was when the study was stopped, it was felt that the number of corpses should again be counted. To limit the impact on the scavenging community, the birds were left *in situ* but were painted with stock marker so that they were not double counted. As might be expected with a larger Great Black-backed Gull breeding population, the number of corpses located in 2014 was the most ever, although the average number of corpses per pair was lower than in all years except 1959, 1970 and 1971. A likely explanation is that the breeding gulls were disturbed between 1949 and 1985 which, although reducing the number of breeding pairs, probably inflated the non-breeding flock which would still be taking shearwaters.

How do Lesser Black-backed Gulls on Skokholm use their environment?

County: Pembrokeshire

Researcher: Dr Viola Ross-Smith

Partner organisation: British Trust for Ornithology

WTSWW contact: Richard Brown, Giselle Eagle

Summary

This study is based on tags deployed on Skokholm Lesser Black-backed Gulls. The solar powered tags, manufactured by scientists at the University of Amsterdam, make a series of measurements, including 3D position, acceleration and temperature, at fixed time intervals. The data downloads remotely, provided individuals are within range of a mast stationed on the island. The data can then be analysed to give a detailed picture of movements and behaviour. This work, funded by the Department of Energy and Climate Change, is designed to assess how Lesser Black-backed Gulls use their environment, and in particular areas of sea earmarked for the development of offshore renewables. Tagging on Skokholm represents an extension to an existing project which began at the Lesser Black-backed Gull colony at Orford Ness, Suffolk in 2010. Lesser Black-backed Gulls were also tagged in 2014 at South Walney, Cumbria, allowing cross-colony comparisons to be made. The tagged birds, along with an additional 25 non-tagged controls, were all fitted with yellow darvic rings with a black alpha-numeric code (number/letter:W e.g. 5A:W). The colour ring is on the left leg and a BTO metal ring on the right. Initial results from Skokholm have already provided insights into the habitats that these birds use, information which could help to improve conservation and management of the island's declining breeding population. Birds were tagged while they were incubating eggs; at this time almost all individuals made daily visits inland to feed, visiting reservoirs and agricultural areas throughout Pembrokeshire and Carmarthenshire, as well as towns like Milford Haven and Pembroke. However, once their chicks started hatching towards the end of May, birds began to fly out to sea, making longer trips as the season progressed. By the time tagged birds departed for migration, some individuals had visited destinations as far afield as the Isles of Scilly and County Wexford in the Republic of Ireland, before returning to Skokholm. Next spring will reveal data on where they go on migration. 'During the breeding season, you can watch the tagged birds' movements in near-real time at: <http://www.uva-bits.nl/project/seabirds-windfarm-interactions-skokholm/>

Parc Slip freshwater invertebrate monitoring

County: Glamorgan

Researcher: Ffion Nurton

Partner organisation: Cardiff University

WTSWW contact: Vaughn Matthews

Summary

Freshwater invertebrate monitoring at various points along the Nant-y-Gerdd stream in order to assess whether the pollution incident caused by the scrape creation had led to any differences between diversity and abundance of different freshwater taxa above and below the site at which the sediment entered the stream. It was a very small-scale study but initial results indicate no differences in either abundance or diversity.

A review of Coed y Bedw Pied Flycatcher monitoring

County: Glamorgan

Researcher: Vaughn Matthews, Lorna Baggett

WTSWW contact: Vaughn Matthews

All historic records from Cliff Woodhead's nest box monitoring data were collated in order to analyse which boxes had been used most frequently by over time. Using this information and other published studies on Pied Flycatchers elsewhere in Europe, new nest boxes were either modified or installed in the areas most commonly selected in the past. Nest boxes were either blocked up to prevent other species occupying them before Pied Flycatchers arrived, placed higher up the tree, fitted with a narrower gauge hole or a combination of the above in order to make them more suitable. These boxes were then monitored throughout the breeding season – unfortunately only one male Pied Flycatcher was recorded but, despite singing, did not manage to attract a female.

Lapwing at Parc Slip

County: Glamorgan

Researcher: Lorna Baggett

WTSWW contact: Vaughn Matthews

Summary

A study monitoring the success (or otherwise) of breeding Lapwing in the Lapwing Field and Northern Wetlands at Parc Slip nature reserve. The monitoring effort was intensive and it is hoped to repeat this work next year to compare the results following all the habitat modifications that have taken place. A full report is available.

Dormice at Brynna Woods and Llanharan Marsh

County: Glamorgan

Researcher: Lorna Baggett

WTSWW contact: Vaughn Matthews

Summary

As it is generally believed that Dormice avoid crossing open spaces, creation of roads within Dormouse habitat is a problem and much debate has gone on over the cost and effectiveness of the Dormouse 'bridges' that have been suggested for mitigation. At Brynna woods nature reserve a project was carried out to see if it could be proven that Dormice would travel across a rope in the tree canopy. Two ropes of differing thickness were installed into two trees, with a bait station in the middle of the rope and a motion sensitive camera trained on it. Two bait station designs were tested: a flat woven willow platform and a woven willow ball with a flower pot suspended in the centre. The second design was considered better as it reduced Grey Squirrel access. Bait included peanut butter and apple. One photo taken at 4:41am captured a Dormouse on a branch near the ropes and feeding station, but no evidence was collected to conclude that Dormice would use the ropes.

Surveying the fungi of Skokholm Island in April 2014

County: Pembrokeshire

Researcher: Hannah Metcalfe (MPhil)

Partner organisation: Aberystwyth University, PFRN

WTSWW contact: Lizzie Wilberforce

Summary

In the 1940s Arthur Frederick Parker-Rhodes, a Cambridge statistician, began compiling a number of papers on the fungi of Skokholm, in particular he held a personal interest in the agarics. The aim was to use state of the art sequencing technology to identify the species most abundant on the island as well as identifying species of conservation interest. This survey revisited the same sites as Parker-Rhodes, which he identified as being of interest because they represented different environmental conditions.

Data are still in the early stages of analysis and will be completed in the coming months. However, initial exploration of the results shows a number of interesting finds. The rare species recorded by Parker-Rhodes as being present in puffin burrows, *Trechispora clanculare*, is likely to remain present on the island. Relatively high percentages of *Trechispora* DNA were found in certain sites (a dry site, previously covered in bracken, with no burrows held the highest proportion), however the lack of barcodes for *Trechispora* species in the DNA sample library meant that identification to species level was not possible.

An investigation into the fungal communities within the roots of *Succisa pratensis*

County: 8 sites throughout Wales and Ireland (WTSWW site in Carmarthenshire)

Researcher: Hannah Metcalfe (MPhil)

Partner organisation: Aberystwyth University, PFRN

WTSWW contact: Lizzie Wilberforce

Summary

Succisa pratensis is a forb found in semi-natural grasslands throughout the UK and in much of northern Europe. The importance of this plant extends beyond that of adding to our botanical diversity: it is the only food plant of the *Euphydryas aurinia* (Marsh Fritillary butterfly), a species which has seen rapid decline throughout the British Isles. Due to *Succisa*'s ability to adapt to different environmental conditions, it has been suggested that symbiotic relationships formed between root fungal communities and plants are providing a competitive advantage.

Eight sites of varying land type were sampled, with three replicates from each. Roots were washed, DNA was extracted and samples were pooled. Ion Torrent™ next generation sequencing (Life Technologies™) was used to obtain sequences of the D1 region of Ribosomal LSU followed by in-house pipeline processing to obtain a spreadsheet containing the species found and their relative proportions within a sample.

It is clear that the fungal communities of *Succisa pratensis* vary quite significantly between sites, with certain fungi being present in unusually high numbers in certain conditions. These

fungal communities do not show any links to soil moisture content; though the replicates are clearly grouped into sites, and into 2 distinct moisture groups.

An investigation into the use of Rotarod samplers to detect *Cryptomyces maximus*

County: Pembrokeshire (WTSWW Dowrog common, Trefeiddan moor, Porthclais NT, WTSWW Llangloffan Fen)

Researcher: Marta Zizek (PhD), Hannah Metcalfe (MPhil)

Partner organisation: Aberystwyth University, PFRN

WTSWW contact: Lizzie Wilberforce

Summary

Cryptomyces maximus is an Ascomycota which is considered to be a parasite of its host plant *Salix* (Willow). *Cryptomyces* is responsible for killing areas of otherwise living twigs, which it enters through areas of bark damage. The interest in this fungus goes beyond the conservation interest of it being an IUCN red data list species and into the methodology being developed to detect it.

During March, a number of sites with extensive willow carrs that are known to have *Cryptomyces* present were sampled using motorised propeller samplers known as Rotarods. These samplers are designed to collect spores on 2 transparent plastic rods as they rotate. A total of 21 rotarods were set to run for 24 hours, after which samples were collected and taken back to the lab for DNA extraction and sequencing. Although these samplers have been developed to have transparent sample arms so that they may be looked at under the microscope, the spores of *Cryptomyces maximus* are not distinctive enough that they may be identified from other spores that the sampler may have picked up.

The findings of this initial trial using the rotarod devices showed that *Cryptomyces* was able to be detected using next generation sequencing from the spore samples. Going forward, the initial sampler design is now in the process of being further developed in collaboration with the Aberystwyth computer science and maths departments to incorporate weather station information to help record the microclimate conditions affecting spore release. The ultimate goal is to find out if this method may be used to prove the presence of rare or invasive species, or even show that there is an upcoming epidemic event.

Leaf litter breakdown and invertebrate colonisation of *Alnus glutinosa* (Common Alder) and *Fagus sylvatica* (Beech) in a small lowland river

County: Glamorgan (Brynna Woods & Llanharan Marsh)

Researcher: William Campbell

Partner organisation: Cardiff University

WTSWW contact: Rob Parry

Summary

Allochthonous energy input is a vital component of low order rivers and decomposition studies help to understand the interacting mechanisms and assess river integrity. This experiment aimed to compare decomposition rates and associated macroinvertebrate assemblages of fast-decomposing *Alnus glutinosa*

(Common Alder) and slow-decomposing *Fagus sylvatica* (Beech) leaf litter, and of whole and shredded leaves. 48 litterbags were placed in a small lowland river in Brynna Woods nature reserve in South Wales and destructively sampled after 3, 12, 43 and 60 days. Exponential decay models were fit to mass loss data. Linear mixed effect models were used to determine significant factors. Alder leaves broke down six times faster than beech leaves. Time was the most significant factor of total abundance, taxon richness, taxon composition and functional feeding group composition. Leaf species and mechanical treatment were not significant factors. Decomposition rates corresponded to the published literature. Macroinvertebrate assemblages largely did not respond to leaf quality, suggesting the greater role of microorganisms such as hyphomycete fungi in decomposition. The implications of this research are that macroinvertebrate assemblages are not detrimentally affected by leaves of lower quality, and this may aid in riparian management planning. However, the relatively small sample sizes and initial weights highlight the need for more research in this area to come to a properly informed conclusion.

Giant lacewings in Coed y Bedw nature reserve

County: Glamorgan

Researcher: Daisy Maryon

Partner organisation: University of South Wales

WTSWW contact: Rob Parry

Summary

This project set out to record the presence of Giant lacewing (*Osymylus fulvicephalus*) which was once recorded in the Coed y bedw reserve as well as sample the fresh water invertebrates which inhabit the area. The giant lacewing is the largest lacewing in the UK, the only British species in the genus *Osymylus*, with a wingspan of up to 5cm. This species is often found near fresh water streams and rivers of which the reserve is plentiful.

The Project started in early 2014 and continued for a sampling time of two months (January to late March) with the hope of finding lacewing larvae. During this time a general census of the freshwater invertebrates was taken. The methods used to carry this project out were kick sampling (4 minute kick and sweep sample with addition 1 minute search under submerged rocks) and pond dipping (5 minute pond sweep). As the larvae of the lacewing are semi aquatic and hunt in wet moss and debris a general untimed search technique was used in the addition searching under moss, stones and bridges along the streamside. Kick sampling and pond dipping revealed a range of invertebrate species, including but not limited to fresh water shrimp (*Gammarus*), water beetles, damselflies, dragonflies, water crickets, true flies, Mayflies (*Ecdyonuridae*, *Baetidae*), stoneflies (*Nemoura*, *Taeniopterygidae*) at least 6 families of caddis fly (*Philoptoridae*, *Physcomiidae*, *Polycentropodidae*, *Rhyacoplidae*, *Sericostomatidae* and *Phryganeidae*), fresh water limpets (*Ancylidae*) and pea mussels (*Sphaeriidae*). All specimens were identified in the

field and returned to the respective habitats afterwards. The project will continue to sample the reserve and search for the presence of the Giant lacewing in the coming months.

Reed Bunting colour ringing RAS project at the Teifi Marshes

County: Ceredigion

Researcher: Teifi Ringing Group

Partner organisation British Trust for Ornithology (BTO)

WTSWW contact: Nia Stephens, Nathan Walton

RAS (retrapping adults for survival) is a BTO special project that aims to provide information on adult survival for a range of species in a variety of habitats, particularly those of conservation concern and those not well monitored by other current BTO ringing.

In 2014 a Reed Bunting RAS was started on the Teifi Marshes. RAS uses captures of adult birds to calculate what proportion survive each year. All birds captured are individually marked with colour rings to increase the re-encounter rate. Visitor participation is being encouraged by asking photographers to take pictures of these colour ringed birds and submit them to us.

A Reed Warbler RAS was also started in 2014.

This is a long term project so will run for a minimum of 5 years. All data collected is submitted to the BTO for analysis.

Funding Self-funding by Teifi Ringing Group members and annual grant from BTO supported by a partnership with the Joint Nature Conservation Committee (JNCC)

Teifi Marshes Constant Effort Site, bird ringing project

County: Pembrokeshire

Researcher: Teifi Ringing Group

Partner Organisation: British Trust for Ornithology (BTO)

WTSWW Contact: Nathan Walton, Nia Stephens

Summary

The Constant Effort Sites (CES) scheme is a national standardised ringing programme within the BTO ringing scheme. Ringers operate the same nets in the same locations over the same time period at regular intervals through the breeding season at sites throughout Britain and Ireland. In 2014, Teifi Ringing Group continued to participate in this important data collection for the 6th year. 760 feet of net are used on the Teifi Marsh for twelve, six hour sessions during the breeding season.

The Scheme provides valuable trend information on abundance of adults and juveniles, productivity and also adult survival rates for 25 species of common songbird. Although data is analysed on a national level by the BTO, trends can be seen and comparisons with national data can be observed from looking at our own data.

2014 preliminary results are available on the BTO website

www.bto.org/volunteer-surveys/ringing/surveys/ces/ces-results/ces-preliminary-results-2014

Funding Refund of cost of rings by BTO in partnership with the Joint Nature Conservation Committee (JNCC)

Cardigan Bay Marine Wildlife Centre ShoreFin Project

County: Ceredigion

Researcher: Cardigan Bay Marine Wildlife Centre

Partner Organisation: Ceredigion County Council, Natural Resources Wales (NRW)

WTSWW contact: Sarah Perry

Summary

Initiated in 2014, ShoreFin is the Cardigan Bay Marine Wildlife Centre's dedicated land-based bottlenose dolphin photo-identification (Photo-ID) project whose aim is to build up an understanding of bottlenose dolphin site usage within the New Quay bay area, to find out which individuals visit New Quay bay and to find out more about the ecology and life history of these animals.

The primary aim of the 2014 field season was to develop methodology for establishing this as an ongoing research project. By documenting the individual animals that visit the New Quay bay area CBMWC aim to acquire a greater understanding of the Bottlenose Dolphin population residing in Cardigan Bay and plan to continue the project into the future. CBMWC anticipate that the data already collected as part of this project will contribute towards answering further questions regarding bottlenose dolphin site behaviours, provide additional information on the range of the local population as well as the potential effects of human activities on their behaviour.

The Cardigan Bay population is estimated to have 213-250 well marked individuals. The 59 individuals identified by the ShoreFin project suggest that approximately 24-28% of the population use New Quay bay at some point during the year (April to October).

Dolphins allocated a high percentage of their time in New Quay Bay to foraging and potentially feeding, supporting claims that New Quay Bay is an important location for dolphins, rather than simply a migration corridor along the Welsh coast. In addition, dolphins spent a proportionate amount of time socialising in the bay, marking it as important for a variety of life history stages.

We have photographic evidence of dolphins feeding in the New Quay bay area. The prey species identified with help from Natural Resources Wales (NRW) and the ShoreFin project data provides us with an opportunity to explore Cardigan Bay dolphin dietary information in a non-invasive way and will fill a noticeable data gap in relation to dolphin diet. The varied species identified included Salmon, Mullet, Cod, Mackerel and Sewin (Sea Trout). We have plans to expand on this research and data collection in the future. This is designed to be an on-going project carried out by volunteers based at the Cardigan Bay Marine Wildlife Centre and managed by Sarah Perry.

The full ShoreFin Project report is available from the CBMWC website - <http://www.cbmwc.org/shore-fin-project/>

Vessel-based marine megafauna surveys in Cardigan Bay

County: Ceredigion

Researcher: Cardigan Bay Marine Wildlife Centre

Partner organisation: Dolphin Survey Boat Trips

WTSWW contact: Sarah Perry

Summary

Research surveys are conducted aboard Dolphin Survey Boat Trip boats, *Sulair* and *Anna Lloyd* sailing out of New Quay, Ceredigion. Surveys take place throughout the Cardigan Bay Special Area of Conservation as well as the wider Cardigan Bay area. A volunteer researcher from CBMWC joins each boat trip and is responsible for systematically recording the effort (position and environmental information) and sightings data (of any marine megafauna species) on a series of survey forms. These data contribute to our growing understanding of the ecology of marine megafauna in the Irish sea. This collaboration between CBMWC and Dolphin Survey Boat Trips has been on-going since 1996 and more formal, stringent data collection has been conducted since 2005. In 2014 we conducted over 287 research surveys. This is an on-going project carried out by volunteers based at the Cardigan Bay Marine Wildlife Centre and managed by Sarah Perry.

Shore-based marine mammal surveys in Cardigan Bay

County: Ceredigion

Researcher: Cardigan Bay Marine Wildlife Centre

Partner organisation: Ceredigion County Council

WTSWW contact: Sarah Perry

Summary

Cardigan Bay Marine Wildlife Centre volunteers conduct shore-based surveys from New Quay harbour wall as part of Ceredigion County Councils annual Dolphin Watch Project that takes place from six coastal sites along the Ceredigion coastline. The Dolphin Watch project was initiated in 1994 amidst fears that relatively high levels of boating activity were causing disturbance to the semi-resident population of Bottlenose Dolphins (*Tursiops truncatus*), CBMWC has been involved since the early 2000's.

The projects main aims are:

- To improve understanding of Bottlenose Dolphin site usage within the Cardigan Bay Special Area of Conservation (SAC)
- To monitor trends in dolphin occurrence and levels of boat traffic
- To assess the effectiveness and need of management measures that aim to reduce the risk of disturbance or injury to dolphins and other marine mammals by boats

- To increase public awareness and appreciation of the marine wildlife in Cardigan Bay

CBMWC volunteers monitor the New Quay harbour survey area and in 2014 we conducted over 930 two-hour shore-based surveys which contributed data to the Dolphin Watch Project. In addition since 2011 we have been involved in the training and coordination of volunteers interested in conducting surveys in Aberystwyth. The data collected from all these surveys contribute to various research outcomes and publications including a bi-annual research report produced by Ceredigion County Council. The latest report detailing the 2010-2012 survey data shows that compliance with local codes of conduct gave more positive responses (heading towards boats) by Bottlenose Dolphins and fewer negative response (heading away) and that compliance with the code of conduct was highest in the New Quay area despite this area having the highest levels of boat traffic. The data also showed that dolphins occupied the New Quay harbour area on average for the longest periods of time.

Cardigan Bay Bottlenose Dolphin (*Tursiops truncatus*) photo-identification catalogue

County: Ceredigion

Researcher: Cardigan Bay Marine Wildlife Centre (CBMWC)

Partner organisation: Dolphin Survey Boat Trips, Natural Resources Wales (NRW)

WTSWW contact: Sarah Perry

Summary

Photo-identification of Bottlenose Dolphins was first conducted in Cardigan Bay in the 1980s and repeated in the early 1990s and in 2001. In 2005 CBMWC established their annual Photo Identification Catalogue, in cooperation with other Welsh marine organisations. In 2005, 139 individual dolphins were photographed and identified from our survey trips. We have now identified over 250 well-marked individuals. From April to October 2014 we conducted over 80 photo-identification encounters with Bottlenose Dolphins whilst out on surveys in Cardigan Bay. The data collected during these encounters is collated and images taken analysed and matched to Bottlenose Dolphins in our existing catalogue, building up a long-term picture of Bottlenose Dolphins in the area, site usage and provide information on population sizes and movements. Some of this work is undertaken under licence issued by Natural Resources Wales. This is an on-going project carried out by volunteers based at the Cardigan Bay Marine Wildlife Centre and managed by Sarah Perry.

Future Fisheries – Living Seas

County: All WTSWW counties

Researcher: Sarah Perry (WTSWW)

Partner organisation: Cardigan Bay Marine Wildlife Centre, Welsh Government

WTSWW contact: Sarah Perry/Sarah Kessell

Summary

The aim of the WTSWW Future Fisheries project is to plan a sustainable future for the traditional fishing industry and the marine environment. To do so, conservationists and marine biologists need to work directly with fishermen, combining both strands of knowledge and we need to engage the public in understanding and caring for the marine environment, thereby working with the demand and supply side to foster positive changes.

The project has collated extensive amounts of fisheries landings data, and drawn together information relevant to the commercial fishing industry in Wales. This information in addition to the outcomes from some analysis of the landings data has been used to provide us with a basic understanding of the important fisheries in Wales.

Work on the initial stages of this project began in late 2013, funded by the Waterloo Foundation and The Co-op partnership. The next stage of the project, funded by the Welsh Government Nature Fund is focusing on conducting a sustainability assessment of some of the Welsh fisheries. Methods used by colleagues at Devon Wildlife Trust who conducted a similar assessment for Devon Fisheries will be implemented. This will provide us with a more detailed understanding of and environmental assessment of the sustainability of fisheries in the south Wales area (south of Aberystwyth), identifying the more low impact fisheries in Wales. Up to date information on species biology, capture methods and current management measures will be obtained and will be used to form the basis of the assessment.

The outcomes of this project assessment will contribute to informing some of our future living seas programme of work.

Atlantic Grey Seal (*Halichoerus grypus*) photo-identification catalogue

County: Ceredigion, Pembrokeshire

Researcher: Cardigan Bay Marine Wildlife Centre

Partner organisation: Dolphin Survey Boat Trips, Natural Resources Wales (NRW), Cornwall Seal Group (CSG)

WTSWW contact: Sarah Perry

Summary

For a number of years we have been collecting photographs of the Atlantic Grey Seals in the wider Cardigan Bay area and have been in discussion with members of Cornwall Seal Group. In 2014 the opportunity arose to initiate this project, to collate existing photographs of Atlantic Grey Seals and to begin to develop a photo-identification catalogue for the Cardigan Bay area. A number of individuals contributed images to the initial stage of this project including Janet Baxter, Lyndon Lomax, Steve Hartley, Sarah Perry and Lisa Morris and we worked with members of Cornwall Seal Group who also have photographs of Atlantic Grey Seals taken in the Cardigan Bay area. The seal photo-ID project therefore aims to create a catalogue of individuals photographed in Cardigan Bay area in order to learn more about their travelling habits and areas that are important to them, collaborating with other organisations working in the Irish Sea in order to learn more about their wider movements and areas of importance to this species. This is an on-going project carried out by volunteers based at the Cardigan Bay Marine Wildlife Centre and managed by Sarah Perry.

Recent Publications relating to WTSWW nature reserves or projects

Birkhead, T.R. (2014) Stormy outlook for long-term ecological studies. *Nature* 514 p. 405

Kipling, R.P. (2014) An investigation of temporal flowering segregation in species-rich grasslands. *Ecological Research* 29 (2) pp. 213-224

McCollin, D. (2014) Reconstructing long-term ecological data from annual census returns: A test for observer bias in counts of bird populations on Skokholm 1928–2002. *Ecological Indicators* 46, pp. 336-339

Mitchell, R.J., Broome, A., Harmer, R., Beaton, J.K., Bellamy, P.E., Brooker, R.W., Duncan, R., Ellis, C.J., Hester, A.J., Hodgetts, N.G., Iason, G.R., Littlewood, N.A., Mackinnon, M., Pakeman, R., Pozsgai, G., Ramsey, S., Reich, D., Stockan, J.A., Taylor, A.F.S. and Woodward, S. (2014) Assessing and addressing the impacts of ash dieback on UK woodlands and trees of conservation importance (Phase 2). Natural England Report. Natural England. Peterborough, UK.

Rhind, P.M. (2014) Conservation and management of coastal slope woodlands with particular reference to Wales. *Journal of Coastal Conservation*, September 2014

Ross-Smith, V.H., Grantham, M.J., Robinson, R.A. and Clark, J.A. (2014) Analysis of Lesser Black-backed Gull data to inform meta-population studies. BTO Research Report No. 654

Shoji, A., Owen, E., Bolton, M., Dean, B., Kirk, H., Fayet, A., Boyle, D., Freeman, R., Perrins, C., Aris-Brosou, S., and Guilford, T. (2014) Flexible foraging strategies in a diving seabird with high flight cost. *Marine Biology*

Simpson, V. Everest, D. and Westcott, D. (2014) RHDV variant 2 and *Capillaria hepatica* infection in rabbits. *Veterinary Record* 174 May 2014

Vafidis, J.O., Vaughan, I.P., Jones, T.H., Facey, R.J., Parry, R.J., and Thomas, R.J. (2014) Habitat Use and Body Mass Regulation among Warblers in the Sahel Region during the Non-Breeding Season. November 2014.

Westcott, D.G. & Choudhury, B (2014) Rabbit haemorrhagic disease virus 2-like variant in Great Britain. *Veterinary Record*, January 2015