CONSERVATION IMPACT CASE STUDIES

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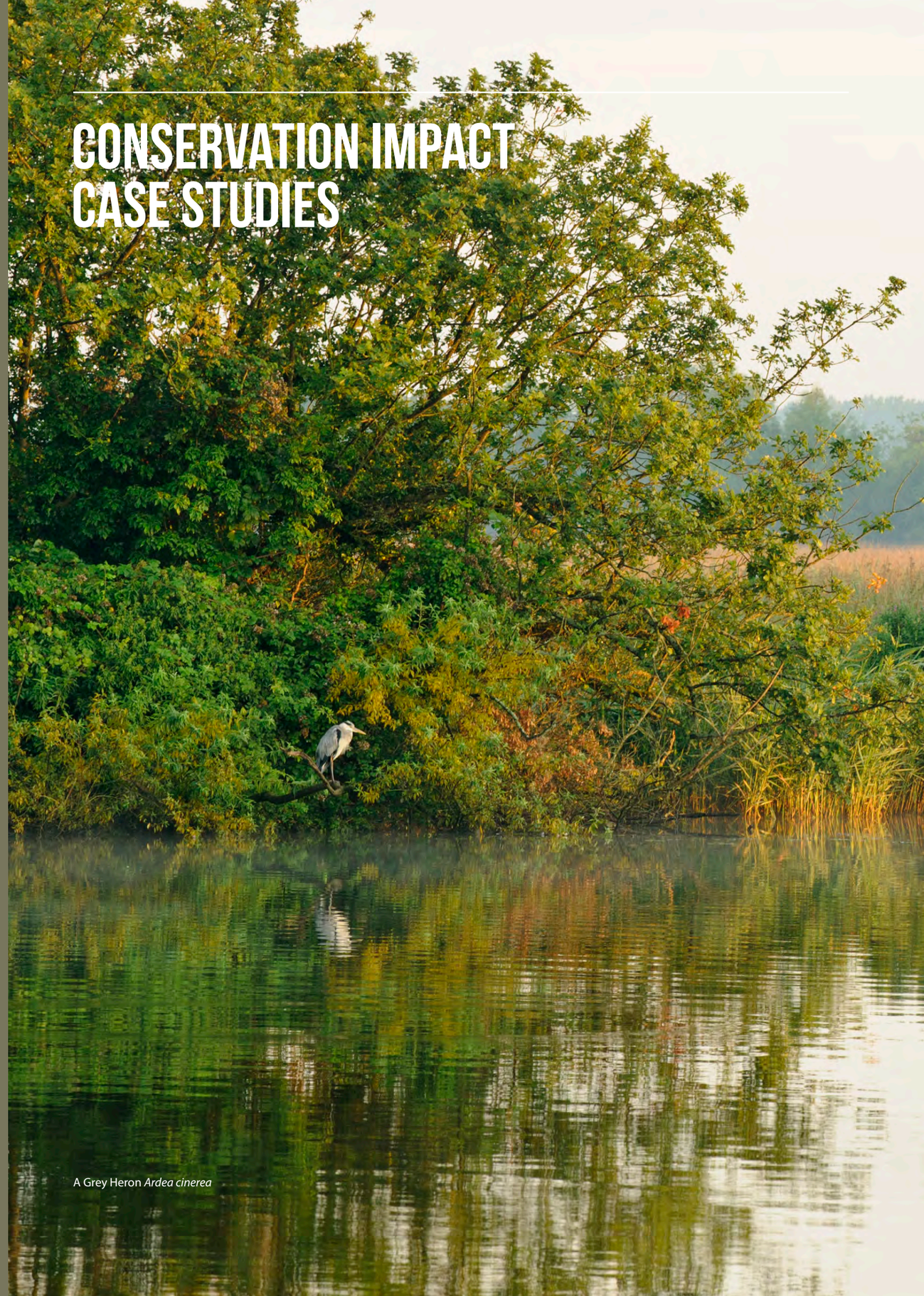


A Grey Heron *Ardea cinerea*

DUKE OF BURGUNDY SPECIES RECOVERY PROGRAMME

Duke of Burgundy *Hamearis lucina*
© Mark Parsons Butterfly Conservation

Lead partner
Butterfly Conservation

Partner organisations
Forestry Commission England, Kent Downs AONB Unit and Natural England

District
Canterbury /Ashford

Description
Butterfly Conservation led a three-year project funded by the National Lottery Fund, called the Denge Woods project (2007 to 2010). The project focused on landowner/woodland owner engagement to restore favourable habitat to ensure that the Duke of Burgundy butterfly was brought back from the brink of extinction. The main method was a Project Officer focusing on landowner engagement to encourage/effect management work coupled with a focus on building a group of volunteer surveyors.

This dovetailed well with Natural England's ongoing long term landscape scale project as part of the Stour Valley/Stone Street landscape project. The Natural England project is a broader landscape-scale project aimed at creating new species-rich grasslands on arable land and species-poor grasslands through natural regeneration, green hay spreading and native provenance wildflower seeding. The approach is based on building one-to-one (between farm adviser and farmer) 'working' relationships with the landscape of farms over multiple decades to effect transformational land use change, farm by farm, using agri-environment schemes to support land use change. The project started in 1995 and is ongoing with the landscape of grasslands being built year by year.

Habitat / species
Butterfly Conservation's project focused principally on the Duke of Burgundy butterfly but also supported advice and management for other butterfly and moth species in the project area.

The Natural England project focused on species-diverse grassland/priority habitat creation on calcareous, neutral, and acidic soils encompassing the landscape of different soil types. Its principal aim is based on building a large landscape-scale resource of new flower-rich grasslands that enable management to be tailored for a wide diversity of species. Duke of Burgundy and Black-veined Moth are examples of species now benefitting from the suite of new grasslands that are being managed on a mid-successional grassland management regime.

Other 'new' grasslands are being managed for early successional species. Farmland birds and bat species are benefitting from the wide diversity of insect-rich habitat, and orchid species are colonising the newly created grasslands.

Funding
Butterfly Conservation's project was funded through Heritage Lottery Fund and the Tubney Charitable Trust. The Natural England project is funded through agri-environment schemes.

Key outcomes
The Butterfly Conservation project had three key outcomes, all of which were achieved:

- To ensure Duke of Burgundy was brought back from the brink of extinction in the county.
- To create wider awareness of Duke of Burgundy and butterfly species generally.
- To engage with local communities and the public to raise awareness of the species and create a body of volunteers to help manage and monitor the Duke of Burgundy butterfly.

The Natural England project aimed to create a new generation of species-rich grasslands on arable land and enhance species-poor grasslands to provide a landscape-scale network of new grasslands to benefit a diverse array of species.

This is an ongoing project that has been running for 25 years with new grasslands being created each year across the landscape. The outcomes are ongoing but to date over 280 ha of new wildflower-rich grasslands have been created within the project area. The benefits that this 'single vision' approach has is evident in the range of species that are benefitting. Specialist species such as Duke of Burgundy and Black-veined Moth have colonised arable reversion/new grasslands. Generalist species such as Dingy Skipper, Linnet, Yellowhammer, Hobby, Turtle Dove, Barn Owl, and Serotine bat are benefitting from insect-rich, seed-rich and structurally diverse new grasslands.

People

Butterfly Conservation project:

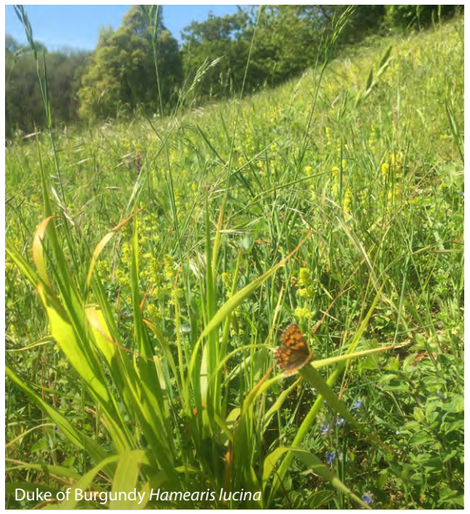
- Fifty-three introductory events were held, with 1,960 people attending.
- Twenty volunteer training events were held, with 315 people attending.
- Eight land-manager workshops have been held, with 95 people attending.
- Ninety-two site visits were made to a total of 64 different sites.

The Natural England project engaged 30 individual farms in the Stour Valley/Stone Street landscape project.

Challenges

Butterfly Conservation:

The challenge of maintaining woodland management at an economic scale is heightened by the fragmented pattern of woodlands and of ownership. Large woodlands in single ownership are more economic and easier to work and administer than many small woodlands under different ownership. Continued voluntary effort is necessary to monitor the woodlands and the butterflies.



Duke of Burgundy *Hamearis lucina*

Natural England:

Convincing policy and decision makers that nature's recovery is critically dependent on needing long-term one-to-one farm advice, close working individually with each farm in the landscape to bring about the scale and extent of transformational land use change that is required to genuinely reverse biodiversity declines.

Blean Coppice with Cow Wheat
© Butterfly Conservation

Unsuccessful aspects of the project

No aspects of the Duke of Burgundy Species Recovery Programme were deemed unsuccessful.

Natural capital (if applicable)

Butterfly Conservation:

The project helped to restore neglected or over-mature coppice crops, getting them back into an economic coppice cycle. Woodland soils are healthier because of restored woodland management.

Natural England:

The 'single vision' focus of re-creating a large resource of species rich grasslands has multiple overlapping benefits for natural capital by providing benefits for soil health, carbon capture, archaeological feature protection as well as the biodiversity benefits.

Monitoring / indicators

Butterfly Conservation:

- Annual counts of Duke of Burgundy at colony sites.

Natural England:

- Flagship species surveys - Duke of Burgundy and Black-veined Moth are monitored annually.
- Other butterfly species such as Dingy Skipper are monitored periodically gauging success on new colonisations on the ex-arable land grasslands.

Looking forward

Butterfly Conservation:

The project created a legacy of greater awareness of Duke of Burgundy, and the butterfly and moth species of east Kent generally. It has also created a legacy of a volunteer 'Duke Guardians', who continue to undertake annual monitoring and get involved in winter habitat management work parties. The Butterfly Conservation 'Magnificent Moths' project will harness the legacy of the volunteer core formed under the Duke of Burgundy project.

Natural England:

The 25-year project is ongoing and works on the same basis of close working with all farms within the landscape evolving, developing, and adding new grassland creation projects each year. As an example, the earliest projects that started in the mid- 1990's are now the colony sites of the flagship species. The Stour Valley project is replicated across four other large landscape areas in east Kent all working on the same one-to-one approach.

VALLEY OF VISIONS LANDSCAPE PARTNERSHIP SCHEME

View across the Medway Gap

Lead partner
Kent Downs Area of Outstanding Natural Beauty (KDAONB) Unit

Partner organisations
Environment Agency, English Heritage, Halling Association, Kent County Council, Kent Police, Kent Wildlife Trust, Medway Council, Medway Valley Countryside Partnership, Plantlife, several Parish Councils, Snodland Partnership, Tarmac (formerly Lafarge Cement and Blue Circle), Tonbridge & Malling Borough Council, Trenport Investments.

District
Landscape of the Medway Gap (middle Medway Valley between Rochester and Maidstone).

Description
The Valley of Visions (VoV) landscape partnership scheme's objective was:

- To conserve and enhance the Medway Gap's heritage landscapes and biodiversity.
- To improve physical and intellectual access to them.
- To engage local landowners, communities, and visitors sustainably in their exploration, interpretation, and long-term care.

It was developed as a response to the KDAONB management plan identifying local landscapes at risk and requiring a landscape scale partnership approach to tackle the issues affecting them. The 'at-risk' definition refers to multiple risks beyond just to biodiversity (although this is an important constituent part) and includes risks to landscape character, heritage, and access provision. The main risks identified by the VoV project included climate change, development (both housing and infrastructure), inappropriate access, lack of awareness and poor management.

The landscape partnership was built upon initial work undertaken by the Medway Valley Countryside Partnership that had also identified the need for a unified approach to tackling the many issues within the Medway Gap. The VoV landscape partnership scheme utilised the framework established by the Heritage Lottery Fund, securing development funding, and a consortium of consultants was commissioned by KDAONB to identify and develop a portfolio of projects that addressed the needs of the landscape.

Key to its success was ensuring that these projects were integrated to achieve greater benefits for the landscape than they would individually. VoV started delivery on the ground in 2007 for three years initially. This was subsequently extended, and the scheme ultimately ran for five and a half years.

Habitat / species
The scheme principally focused on chalk grassland, tidal marshes, and arable weeds and wildflowers. In addition, it also included post-industrial brownfield habitats, with an emphasis on the former chalk quarries found across the valley. The scheme also included a specific project on the re-introduction of the Adonis Blue Butterfly on strategic chalk downland sites in the valley.

Funding
The principal funder for VoV was the Heritage Lottery Fund. This was supplemented with funding from the European Regional Development Fund (ERDF) Interreg IVA Channel Programme, Kent Wildlife Trust, Lafarge Cement, Trenport Investments, Tonbridge & Malling Borough Council, Medway Council, Halling Association and Snodland Partnership.

Key outcomes
- A linked network of sustainable managed chalk downland across the scarp slope of the Downs.
- Enhanced management for all the grazing marsh within the scheme area, together with potential opportunities for wildlife habitat improvements through managed retreat.
- Enhanced management of other farm habitats and the potential both to create natural corridors linking the valley floor with the chalk uplands and to extend arable weed and wildflower habitats.
- Created public understanding, accessibility and skills in conserving and enjoying the iconic landscape and habitat features within the Medway Gap.
- Developed an enhanced Farm Environment Plan concept with a Farm Advisory Service, substantially expanding the potential of the scheme to deliver these enhanced landscapes, habitats, biodiversity, and access.
- A coordinated and systematic approach to 'securing the landscape' from anti-social behaviour and increasing landowner confidence.
- Integrated training, interpretation, and community engagement programmes in partnership with schools and a range of heritage, nature conservation and community organisations.
- Improvements for key heritage assets, including industrial heritage sites and the Bishop's Palace at Halling.
- Increased understanding and appreciation of the area's industrial heritage.
- Enhanced management of the area's Neolithic sites, along with increased intellectual access and understanding.
- A programme of community-led artistic activities designed to engage people of all ages, especially the young, in celebrating local landscapes, wildlife and heritage through music and drama.


Ladd's farm, Snodland
during restoration

- Enhanced and improved physical links to the heritage items and landscape within the Medway Gap for the local and wider community.
- Improved access to the countryside including along the east and west banks of the Medway and new bridleway provision.

People

Community participation and involvement was key to the success of VoV and is indeed a prerequisite for receiving funding from the Heritage Lottery Fund through the Landscape Partnership programme. In summary:

- 5,000+ hours of volunteer time were contributed to nature conservation work.
- 3,290 people attended training events, workshops, and conferences.
- 2,720 attended walks, rides and events provided by VoV.

In addition, each project within the scheme involved contributions from volunteer groups, members of the public as well as with partners in a more professional capacity.

Challenges

Complications in completing legal agreements for major works.

- Lack of continuity between development and delivery phases of the scheme.
- Changes of personnel within delivery teams and partners.
- Global recession.
- Initially proposed three-year project timeframe was too short.
- Supporting infrastructure not carefully considered enough.
- Some projects were under-developed when the delivery period began.

Unsuccessful aspects of the project

No element of the scheme was considered unsuccessful. Due to its extended operational period, most issues were overcome or delivered in alternative ways. The extension also allowed for the enhancements of certain parts of the scheme. Having said this, one of the key drivers for the timing of the scheme (development within the valley) did not occur due to the global recession in 2007. This meant that the opportunity to capitalise on, influence and integrate large-scale industrial and residential developments was lost. This also introduced increased caution from major commercial partners and slowed progress considerably.

Natural capital

Natural capital improvements were not measured.

Monitoring / indicators

Each individual project, whether delivered directly by the VoV team or delivery partners, had a set of outputs against which progress could be monitored and evaluated. These were collated for the Heritage Lottery Fund and were centralised to demonstrate the impact that landscape-scale natural and cultural heritage projects had.

With over fifty individual projects and further sub-projects, these output indicators were considerable but did focus on statistical data regarding amounts of habitat conserved, e.g.:

- 1666.6 ha of chalk downland habitat conserved.
- 42 ha of arable reversion.
- 18.7 ha of parkland improved.
- 155 ha of tidal marsh conserved.
- 42.6 ha of former chalk quarry brought into management.

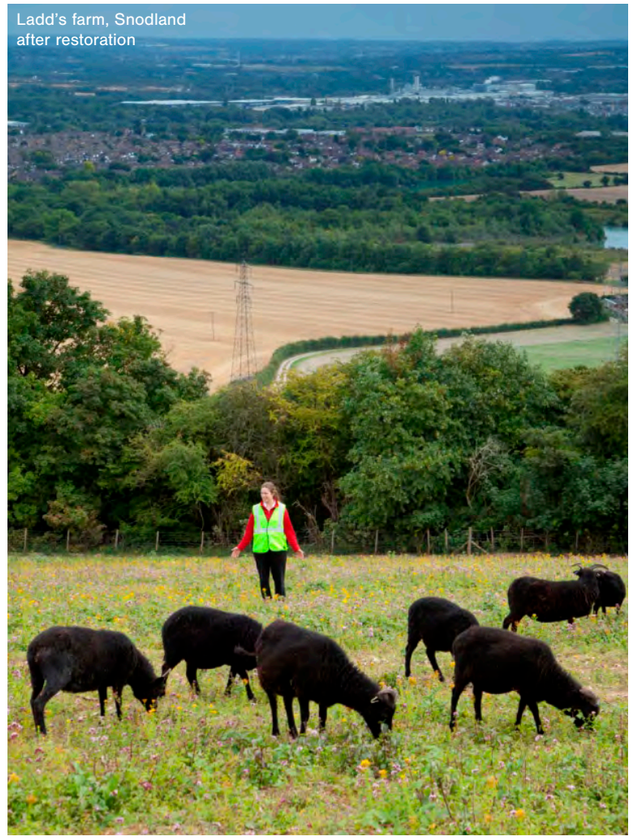
The National Lottery Heritage Fund has since moved to an output and outcome-based evaluation and monitoring system that better represents the impact of these types of schemes.

Looking forward

Many of the projects included within the VoV Landscape Partnership Scheme were of a finite life and naturally came to end upon the scheme's completion. However, each biodiversity-related project had a legacy plan to ensure that management was maintained. In many cases, new working relationships were developed or built upon to ensure that the benefits could be maintained. Examples included:

Ladd's Farm chalk grassland restoration:

VoV directly delivered a project to restore chalk grassland that had succeeded to scrub and secondary woodland since the 1950s. VoV worked with the landowner (Lafarge Tarmac) to clear encroaching vegetation, install grazing infrastructure, and introduce stock grazing. A conservation grazing partnership was established along with the training of community volunteers to provide livestock checking support. Training was also provided to estate staff at Lafarge Tarmac, and the holding entered an Environmental Stewardship agreement. A support partnership was also established between Lafarge Tarmac and Kent Wildlife Trust.


Ladd's farm, Snodland
after restoration

Securing the Landscape:

Persistent illegal motorised off-road access and subsequent damage to woodland habitats within a SAC was considerably reduced through this project. Through route enhancements, target hardening and enforcement a 99% reduction in unwanted activity was achieved during the lifetime of VoV. The provision of a Police Community Support Officer was pivotal in achieving this, with their actions co-ordinated by a Tasking and Co-ordination Group (T&CG) established with Kent Police support. This T&CG has been maintained, and landowners continue to financially support the PCSO role. The group is now co-ordinated by the Kent Downs AONB through the North Downs Way National Trail Manager and has extended its geographical reach.

The VoV approach also provided the impetus for the development of the Darent Valley Landscape Partnership Scheme which is currently delivering and led by the Kent Downs AONB Unit. The lessons learned from VoV are being applied to the DVLPS.

HEATH FRITILLARY SPECIES RECOVERY PROGRAMME

Heath Fritillary *Melitaea athalia*
© Will Langdon

Lead partner
Butterfly Conservation

Partner organisations
Forestry England, Kent Wildlife Trust, RSPB, Woodland Trust, and private woodland owners.

District
The Blean Woodland Complex, Canterbury

Description
This was a long-term programme to save the Heath Fritillary. The work began in the early 1980s. At that time, the Heath Fritillary was thought to be on the brink of extinction in the UK. The aim of the conservation effort has been to work with site owners and managers to increase the distribution and abundance of the Heath Fritillary in the few remaining areas where the butterfly can be found. This will then strengthen these remaining colonies and make them more robust and resilient. In Kent, this has involved encouraging and increasing good woodland management. This programme of work is ongoing.

Habitat / species
- Heath Fritillary *Melitaea Athalia*.
- Common Cow-wheat *Melampyrum Pratense*.
- Ribwort Plantain *Plantago Lanceolata*.

Funding
Funding by Natural England under the Species Recovery Programme and by private donors.

Key outcomes
- The UK Heath Fritillary population is stable, and the risk of imminent extinction has been avoided.
- In Kent, Heath Fritillary distribution is increasing.
- The Kent Heath Fritillary population is now the largest of the four remaining UK populations.
- 2021 produced Kent's highest Heath Fritillary counts on record. A flight-season peak of more than 3,000 Heath Fritillaries was counted in July 2021.
- Targeted woodland management has been delivered across at least nine sites around The Blean.
- The work has maintained a network of 25 inter-connected meta-populations across this woodland complex.
- Foodplant monitoring has been undertaken across all these sites. In 2021, more than 400 hectares were surveyed for Common Cow-wheat.
- The Heath Fritillary has colonised three new woodland sites in the last four years.
- Annual reports have been produced and shared with all interested organisations and individuals.

People
Volunteers have undertaken structured annual surveys of the butterfly and its foodplants. These surveys include butterfly transects, timed counts and targeted searches.

Many people have been involved in the project over the years, some contributing 100's of hours. Around a dozen volunteers are involved each year and this number is increasing.

Challenges
- Heath Fritillary habitat creation relies upon a continuity of good, active woodland management. Woodlands which are not managed appropriately or are undermanaged can quickly become unsuitable for the butterfly.
- The essential survey and monitoring have relied upon the contribution and dedication of volunteers. This means more volunteers are needed to help provide survey coverage for all the potential areas across The Blean.
- This Butterfly Conservation-led programme has required ongoing dedicated staff time. Butterfly Conservation is a relatively small charity and requires more support to cover the Heath Fritillary and all of Kent's other priority butterflies.

Unsuccessful aspects of the project
Some woodlands are unmanaged or are being managed in a way that is not suitable for the Heath Fritillary and other rare and threatened species.

Main lessons learnt:
The Butterfly responds quickly and very positively to good, targeted woodland management.

Natural capital
- Woodland management which supports the Heath Fritillary has produced a constant supply of good quality timber and enhanced the structure of the woodlands for efficient extraction.
- The coppicing, thinning, and harvesting promotes new tree growth which is good for carbon sequestration and for wildlife.
- The work has produced open sunny woodlands which are enjoyed by people.
- This ongoing management maintains healthy woodland soils.
- Management for the Heath Fritillary benefits a wide range of other species. This includes other butterflies and moths, birds, reptiles, and small mammals.

- The Heath Fritillary is one of the rarest butterflies in the UK. People travel (often considerable distances) to see the butterfly in Kent.

Monitoring / indicators

Monitoring methods:

- UK Butterfly Monitoring Scheme transects (seven different transects).
- Butterfly timed counts and peak counts.
- Food plant surveys – abundance and distribution.
- Other priority moth species surveys.

Indicators:

- Butterfly population trend analysis.
- Butterfly peak counts.
- Butterfly distribution.
- Foodplant distribution and abundance.
- Presence/absence/distribution of priority moths.

Looking forward

The Kent Heath Fritillary population is now the largest and most secure of the four Heath Fritillary populations in the UK. The species is no longer at imminent risk of extinction. The lessons learned by this work in Kent are shared with site managers, conservation professionals and volunteers in the other three Heath Fritillary landscapes around the UK. These successes and the techniques used can also be applied to other rare and threatened species and help to inform the conservation of those.

This is still an ongoing programme. Butterfly Conservation will continue to work with woodland owners and managers within The Blean woodland complex. It is hoped that the Species Recovery Programme will continue to receive support to continue this work.

Heath Fritillaries *Melitaea athalia*
© Bob Eade

Heath Fritillery *Melitaea athalia* © Jim Higham

KENT TURTLE DOVE FRIENDLY ZONES (TDFZs) PROJECT

Turtle Dove *Streptopelia turtur*
© Jack Farrar

Lead partner
RSPB (As part of the Operation Turtle Dove Partnership)

Partner organisations
Environment Agency, Kent Ornithological Society, Kent Wildlife Trust, local Kent farming community, local landowners, Local Nature Reserves, Natural England, Ministry of Justice, The River Stour (Kent), Internal Drainage Board (IDB) and The National Trust.

District
Swale DC, Tonbridge & Malling BC, Tunbridge Wells BC, Maidstone BC, Ashford BC, Folkstone & Hythe DC, Canterbury CC, Dover DC, Thanet DC.

Description
Kent is the stronghold for Turtle Dove in the UK. Within Kent, 12 important core Turtle Dove areas have been identified as the highest priority for the species. These areas are known as Turtle Dove Friendly Zones (TDFZs) and are the areas where the RSPB is prioritising its work. These areas were identified using the 2011 BTO Bird Atlas. The project worked with landowners to develop on the ground habitat management for the species as well as engaging with the local community. This highlighted the plight of the species and promoted community conservation efforts.

The project aims:
- To be engaging with at least 25% of the land holding area within each TDFZ (average total area 6,000 ha).
- To have delivered at least 2% of seed-rich Turtle Dove foraging habitat within the engaged area (i.e., minimum target of 30 ha within an average TDFZ).
- To have delivered at least one clean water source, located within 300m of suitable nesting habitat, per 1 km^2 of engaged area.
- To have established and be supporting a network of supplementary feeding sites to provide an emergency food source, while more sustainable measures are developed, in each operational TDFZ, by 2025.

The project aimed to engage local communities and will highlight the importance of Kent for this species. This project also hoped to work with local communities to deliver on the ground conservation measures for this species. Communities would feel ownership of the problems and the solutions for Turtle Doves in their area. The project also saught to establish a network of people who are acting as Turtle Dove champions.

Habitat
Research shows that Turtle Doves require three key resources ideally within 300 m of each other:

1. Food: Turtle Doves feed on the ground, almost entirely on seeds of low growing wild plants or spilt crop seeds. They need sparse vegetation and or patches of open ground to be able to find the seeds.

2. Nesting habitat: Turtle Doves nest in dense woody vegetation, e.g., tall thick hedgerows, or tall dense scrub.

3. Accessible water: such as shallow-sided ponds.

Funding
This project is funded by the RSPB, Natural England, and the Roger De Haan Charitable Trust. Many of the farmers in the project are also supported by Countryside Stewardship.

Key outcomes
- Fifty-four sites engaged and delivering habitat for Turtle Doves in 2020/21 across seven TDFZs in Kent.
- Sixty supplementary feeding locations set up in 2021 across seven TDFZs.
- A minimum of 44 ha of foraging habitat (cultivated margins and sown mix) in 2020/21.
- The first national Turtle Dove survey completed in 2021.
- District Councils contacted to highlight that they fall within a TDFZ as part of a proactive drive to highlight the plight and habitat requirements of Turtle Doves as a response to increasing development pressure across Kent.
- Two casework volunteers recruited to help with increasing Turtle Dove specific casework across Kent.
- Five public engagement events hosted/attended in 2019.
- By the end of 2024, the Turtle Dove population within the network of operational TDFZs has not gone below the number recorded by the national survey of Turtle Doves in 2021.

People
The project has worked with seven community champions and eight farmer champions who have delivered on the ground conservation measures for Turtle Doves and seek to raise awareness of Turtle Doves, encouraging more people to take action in their area.

18 volunteers have been recruited to the project in 2020/21. Volunteers carry out breeding bird surveys, habitat advice, community engagement and practical habitat management of Turtle Dove forage plots.

Challenges

Loss of suitable habitat because of local developments in Kent (particularly mature scrub – this habitat can take up to 20 years to become suitable for nesting Turtle Doves).

Natural capital

The creation of feeding areas for Turtle Doves will benefit pollinating insects and contribute to good soil management.

Monitoring / indicators

A team of local volunteers have been recruited to conduct Turtle Dove surveys of 20 randomly generated 1 km² squares within four of the 12 TDFZs to see if the conservation measures put in place are having an impact on Turtle Dove populations within the TDFZs. As the first squares were surveyed in Kent in 2017, 2019 was the first year in which it has been possible to repeat these surveys and make a comparison across the years. In the squares in which it has been possible to make a direct comparison, the number of Turtle Dove registrations was the same in 2019 as in 2017. This may not at first seem very exciting but when compared to the reported decline in the wider UK countryside of 51% between 2013 and 2017, this could be a very significant result if numbers are maintained in the coming years. This work has been further enhanced by the first ever national Turtle Dove survey which was completed in 2021 (led by KOS and RSPB in Kent); with over 200 survey squares being surveyed across Kent.

Looking forward

By the end of 2030, it is hoped that there will be evidence of sustained population recovery in the UK. Additionally, the project aims to establish a legacy plan for the project which will involve the creation and development of volunteer networks (including Farmer Champions and voluntary Turtle Dove Officers) to provide self-sustaining posts for project delivery.

Turtle dove *Streptopelia turtur*
© Jack Farrar

Turtle Dove *Streptopelia turtur*
© Jonathan Cannon@pixabay

INTRODUCTION OF HAYMAKING TO YALDING LEES TO RESTORE SPECIES-RICH LOWLAND MEADOW

Lead partner
Medway Valley Countryside Partnership (MVCP)

Partner organisations
Plantlife and Yalding Parish Council.

District
Yalding, Maidstone, Kent

Description
The project aimed to transform an area of rank neutral grassland as identified in the 2012 Kent Habitat Survey to one which is more species-rich following a change to the historical management regime of a summer cut with the cuttings left on the grassland. The simple change was to collect the arisings cut which had been suppressing the growth of finer herbs and grasses as well as the associated invertebrate and avian biodiversity. This is an on-going change to the management. The project started in 2016 and is now on-going ad infinitum.

Habitat / species
- Neutral grassland.
- Abundance and diversity of Bumblebee fauna; the rare Red Shanked Carder Bee has not yet been seen but has been observed within ½ mile.
- Indicators of species-rich meadow are Pepper-saxifrage, Lady's-bedstraw, Salad Burnet which are all present.

Funding
National Heritage Lottery Fund (Magnificent Meadows project) and Yalding Parish Council for on-going management work.

Key outcomes
The project aims:
- Increase floral species richness.
- Increase invertebrate richness and abundance.
- Increase avian abundance.
- Increase small mammal abundance

There has been initial evidence that all the above measures are being achieved but it will only be possible to state the success of the project after a period of monitoring of at least 10 years which has not yet elapsed.

People
People involved in the project include local contractors, the local parish council, and local biological recorders. Members of the public, which included walkers and those enjoying the public open space and improves aesthetics of the landscape.

Challenges
- Meeting the management costs from the parish council budget.
- Lack of local flora and fauna expertise.
- Lack of local expertise of hay making.
- Ensuring the hay cut is taken at the correct time.
- The on-going monitoring of the area.

Unsuccessful aspects of the project
The project has worked well and only the long-term monitoring will truly be a gauge of its success. As with many projects across the county the availability, expertise and increasing ageing population of the biological recording community is a risk to this and many similar projects.

Natural capital
The project is benefiting natural capital:
- By allowing CO_2 to continue to be locked into the soil.
- By capturing more NO_2 through improved habitat management.
- By improving soil quality and invertebrate fauna.
- By reducing risks of soil erosion.
- By enhancing biodiversity.
- By improving local flood storage capacity.

Monitoring / indicators
- Annual flora surveys looking for indicators of species rich meadow.
- Invertebrate surveys.
- Bird surveys including Barn Owl monitoring.

Signage at Yalding Lees © Richard Usher

Looking forward

This change of management practice is now followed every year and has already provided multiple benefits. Not only does the area now have the potential to be more floristically diverse, and thus support a greater range and abundance of invertebrates, but the hay is now of sufficiently good quality that it can be sold and offset against management costs. It has been demonstrated that good quality herb rich fodder not only can be sold at a premium price but has significant health benefits for the animals which consume it, lowering the need for expensive antibiotics. On-going haymaking aids the local economy and keeps those skills present in the local workforce. The project has resulted in the restoration of 3 ha of species-rich lowland meadow.

The Lees still offer good recreational access including dog-walking, volunteering for conservation tasks with MVCP, school education groups, healthy living walks, and environmental education for adults and HE students. The area now provides a stunning vista of wildflowers in the spring, and undoubtedly improves the aesthetic setting of the village and enhances the landscape character. Open public access via a PROW allows thousands of visitors per annum to enjoy the area.

A local flora expert now makes an annual survey of the grassland to see how the species richness is progressing. This is a long-term piece of monitoring, but early indications of increased floral diversity and notably the abundance of bumblebee fauna are encouraging.

Dandelion filled meadow & woodland

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Yalding Lees species rich lowland meadow

MAKING A BUZZ FOR THE COAST (MAB)

Shrill Carder Bee *Bombus sylvarum*
© Bex Cartwright

Lead partner
Bumblebee Conservation Trust (BBCT)

Partner organisations
Kent County Council, Kent Wildlife Trust, Natural England, RSPB, Swale Borough Council, Thames Water, Thanet District Council.

District
North Kent Coast (Dartford to Deal).

Description
Kent is the most important county in the UK for Bumblebee species diversity (22 out of the 24 UK species are present) with five of the UK's seven rarest bumblebee species present. The north Kent coast is one of the few remaining UK strongholds for the Shrill Carder Bee *Bombus sylvarum*, one of the UK's rarest bumblebees. One of the primary aims of the project was to safeguard rare bee populations by creating and restoring habitat and linking isolated populations through the creation of flower-rich 'stepping stones' and habitat along the coast. Over three and a half years (2017-2021) the project delivered outcomes under three main themes:

- Providing habitat for bumblebees.
- Understanding populations.
- Engaging communities.

Methods used included:
- Bespoke landowner advice.
- Public engagement and volunteer activities.
- Identification and ecology training.
- Volunteer recruitment.
- Survey and monitoring.

Habitat / species
Species:
- Shrill Carder Bee *Bombus sylvarum*.
- Brown-banded Bumblebee *Bombus humilis*.
- Moss Carder Bee *Bombus muscorum*.
- Ruderal Bumblebee *Bombus ruderatus*.
- Red-shanked Bumblebee *Bombus ruderarius*.

The project looked at a range of habitats which included:
- Grazing marsh.
- Arable land.
- Semi-improved or unimproved grassland.
- Field margins and hay meadows.
- Public greenspace.
- Orchards.
- Golf courses.
- Seawalls.
- Native hedgerows.
- Roadside verges.
- Smallholdings.
- Allotments.
- Church yards.
- Bee-friendly gardens.

Funding
Funders included National Lottery Heritage Fund, John Ellerman Foundation, Thames Water, Kent County Council, the Dulverton Trust, Schroder Charity Trust, Clark Bradbury Charitable Trust, Mackintosh Foundation, R G Hills Charitable Trust and Chapman Charitable Trust.

Key outcomes
All the key outcomes of the project were achieved. The outcomes included:

- Land management advice was given on over 700 ha and 250 ha of habitat was actively created or restored. 117 sites received bespoke advice with over 200 land managers engaged or advised.
- Management plans written and delivered for five key sites (72 ha itotal).
- Case studies produced for each of these five sites and three other land management advisory sites.

The case studies covered a variety of land uses and habitats: two extensive grazing marsh nature reserves (RSPB Northward Hill and Great Bells Farm); Long Reach Sewage Treatment Works (Thames Water); Foreness Point (coastal chalk grassland) and the Sunken Gardens (community group restoring a local authority public garden – both sites Thanet District Council); Ellenden Farm (private conservation-focused farm); Butler Farms (private commercial fruit farms) and Taddington Valley Wood (local authority urban-fringe ancient woodland).

- 12.1 ha bee-road nature reserves were created, maintained, or restored, and monitored with agreed management plans and partnership agreement (between KWT, KCC, Swale BC and BBCT) for five years subsequent management. A case study was produced for three Bee Roads sites.
- Forty-two new BeeWalk bumblebee monitoring transects set up in the project area.
- Total records submitted (iRecord): 473 rare and scarce bumblebee species records (237 for Shrill Carder Bee).

People
- 10,628 people engaged at 296 events itotal.
- Seven trainees employed through the project with six now employed in the conservation sector.
- 373 (96 BBCT registered volunteers and 277 supporters) volunteers took part and a total of 11,115 volunteer hours recorded.

- A total of 51 training events including bumblebee identification (beginners, intermediate and advanced), solitary bee and wildflower identification training and landowner and farmer training. This also included 19 online training sessions from March 2020 to February 2021.
- A total of 542 people trained, including 11 field sessions with a total of 125 attendees.

Resources created:

- Making a Buzz leaflet.
- The Bumblebees of Kent leaflet.
- Shrill Carder Bee ID card.
- What's that Bee? digital resource.
- Gardening for Bumblebees.
- Getting Started digital leaflet.
- Shrill Carder Bee activity sheet for children.
- Nine banners and additional events material created.
- Other resources being taken forward separately include advanced gardening for bumblebees' digital assets for website and a garden centre micro-actions resource.

Three community competitions:

- Year one photography – completed.
- Year two poetry competition – completed .
- Year three – MaB Art competition – completed.
- Buzzing Gardens, Wild about Gardens scheme; 103 total entries to Garden with the Best Buzz (2018-19).
- A total of 97 gardens in Kent registered on BBCT Beekind webpage.
- Neighbourhood with the Best Buzz 2020 award; Faversham announced overall winner – Faversham has over 50 gardens, community spaces, public spaces, allotments, and road verges advised by Buzzing Gardens WAG scheme.
- Buzzing public parks – four Pollinator Parks designed, and hard landscaping completed, and detailed written ongoing maintenance advice provided. Planting in progress with some to be completed post-project, namely: Medway Capstone and Riverside Country Parks, Faversham Recreation Ground and Windmill Hill Garden and open space.
- Five interpretation boards produced for the Sunken Garden, Westbrook; Medway Capstone CP & Riverside CP; Gravesend Windmill Hill; Faversham Recreation Ground.

Challenges

- Year three of MaB was impacted by COVID-19, with all themes and delivery of the project being affected in some way. The decision was taken quickly to ensure that habitat and land management advice, species and habitat monitoring, and activities for volunteers, remained priorities in 2020-21, although the methods for delivery were adapted to work within the regulations and government guidelines for the pandemic (with online working, solitary site work or very limited group working when possible). The biggest impact was on public engagement work, events, workshops, field sessions and volunteer practical tasks.
- Staff changes had some impact on delivery to a smaller extent, although staff continuity for the final two years of MaB proved successful.
- The complexity of the agreed activity plan, budget and large number of deliverables proved ambitious, and adjustments were made to rationalise certain elements of the agreed work programme.
- The recruitment of volunteers in some parts of the project area proved challenging (due to demographics and methods of engagement).
- Priorities of partners changed over the course of the project, and certain elements of shared partnership working required structured communication approaches.

Unsuccessful aspects of the project

Overall, the project was very successful in achieving the desired outcomes and impact that had originally been envisaged. However, key lessons learnt for future projects include:

- The MaB Project Activity Plan, deliverables and budget was tightly defined. For future projects, ideally, these should not be overly prescriptive to allow greater flexibility for the inevitable changes that occur over a project period of three plus years.
- Communications with partnership was generally good, although partnership agreements might need to be reviewed on an annual or more regular basis to ensure the partners priorities and project outcomes remain synchronised.
- The steering group partnership of future projects would benefit from all partners having greater involvement from the start in the governance and steering of the project.
- Building relationships with new landowners and stakeholders can take many years, especially to be able to monitor and evaluate the impact of advice and change in land management on habitats and species. Three years is a minimum period to be able to measure changes to habitat creation and restoration, and land management generally.
- Ensuring the evaluation process, monitoring and lessons learnt are built into the work programme of the project before the delivery period starts.

Natural capital

- Increased area and enhancement of flower-rich bumblebee habitat across the project area increasing connectivity for rare and scarce bumblebees.
- We have a better understanding of the numbers and populations of priority bumblebee species on specific sites and across areas of north Kent coast, through the success of the project's recording and monitoring work.
- Awareness of these priority species and their habitat requirements has increased, particularly amongst some partner organisations and stakeholders, resulting in shifts in approaches to longer-term land management that are being incorporated into some organisations' policies, planning and operations, with an overall greater appreciation for the importance and benefit of a Natural Capital approach. The great benefit that can be gained by providing for wild bees and other pollinators and their pollinating eco-services to commercially farmed flowering crops was also a key outcome.

Monitoring / indicators

- Bumblebee monitoring was carried out using standardised methodology 'BeeWalk' with data fed into the national dataset and published as an annual report.
- Monthly transect walks were conducted from March – October.
- Ad-hoc bumblebee recording and BeeBlitz survey events with data fed into national recording schemes.
- Floral abundance and diversity surveys (% cover, seasonal forage availability and diversity).
- Selected case study sites/compartments had detailed botanical surveys.

Looking forward

- Advisory materials – eight case studies covering 11 sites produced (see above); two land management factsheets covering commercial orchards and golf courses; new interpretation panels and signage on 13 key sites.
- Ten-year management plans after the end of MaB are being implemented on five partner sites.
- Partnership agreements on joint working for Bee Roads management and maintenance are being taken forward for five years.
- The volunteer community and BeeWalkers are now being overseen and supported by BBCT core staff, or through partners, volunteers and support teams.
- An online learning resource using open-source platform Moodle, is to be prepared to allow access for registered volunteers to access all Making a Buzz online training videos and resources available that have been made during the duration of the project.
- Continuity of the work of the project will be achieved through ongoing involvement and delivery of actions through Kent's Plan Bee, other local authority pollinator strategies and other plans and policy work.

Future projects

Shrill Carder Bee Conservation Strategy 2020 – 2030

In response to the urgent need for a coordinated approach to ensure the conservation of this iconic bee, a conservation strategy for Shrill Carder Bee was launched in 2020. The strategy has been developed by a wide range of stakeholders and partners including BBCT, Buglife, RSPB, Natural England, NRW and BWARS with substantial input from other NGOs, academic institutions, government bodies and land managers. The strategy planning process included the development of a comprehensive species knowledge review and threat analysis. Loss and fragmentation of habitat is a key threat isolating Shrill Carder Bee populations in England and Wales. The Shrill Carder Bee requires conservation efforts at a landscape-scale and can be a flagship species for the restoration of a network of connected flower-rich habitats. Objectives of the strategy include developing local action plans and delivering and supporting new projects within the five remaining population areas of which Kent is a key stronghold and focus area.

Bee Connected 2022 – onwards

Due to the success of the Short-Haired Bumblebee project a new legacy project Bee Connected is being developed which carries on the most successful parts, such as habitat advice, working with volunteers and outreach. Grants will be applied for this over the next year.

BBCT Making a Buzz for the Coast Training field session
© Daniel Naylor

THE SHORT-HAIRED BUMBLEBEE REINTRODUCTION PROJECT

Large garden bumblebee *Bombus ruderatus*

Lead partner
Bumblebee Conservation Trust (BBCT)

Partner organisation
Natural England, RSPB.

District
Spreading from High Weald in East Sussex up to south Ashford and across to Hythe in Kent.

Description
The Short-haired Bumblebee was last recorded near Dungeness in 1988 and was declared extinct in 2000. This project aimed to reintroduce this lost species to the UK, raise awareness of Bumblebee and flower meadow declines, increase resident rare Bumblebee populations, and recreate and give advice on managing and maintaining flower-rich areas. The project has been running since 2009 and is working with farmers, conservation groups, smallholders, and other landowners to create flower-rich habitat within the project area. The project is ongoing.

Methods used in this project include:
- Bespoke landowner advice.
- Public engagement and volunteer activities.
- Identification and ecology training.
- Volunteer recruitment.
- Survey and monitoring.

Habitat / species
Species:
- Short-haired Bumblebee *Bombus subterraneus*.
- Shrill Carder Bee *Bombus sylvarum.*
- Brown-banded Bumblebee *Bombus humilis*.
- Moss Carder Bee *Bombus muscorum*.
- Ruderal Bumblebee *Bombus ruderatus.*
- Red-shanked Bumblebee *Bombus ruderarius.*

The project looked at a range of habitats which included:
- Grazing marsh.
- Arable land.
- Semi-improved or unimproved grassland.
- Field margins and hay meadows.
- Public greenspace.
- Orchards.
- Golf courses.
- Seawalls.
- Native hedgerows.
- Roadside verges.
- Smallholdings.
- Allotments.
- Church yards.
- Bee-friendly gardens.

Funding
Funders included IBRA, Natural England, Roger de Haan Charitable Trust, Royal Entomological Society, RSPB, Miss Betty Liebert, Hawthorn Trust, John Lewis, and the many supporters who have donated through local fundraising activities.

Key outcomes
- Since 2009, the project has created, restored, advised on, and improved management on approx. 2460 ha in southern East Sussex and southern Kent.
- Increased populations of the rare bumblebee species Brown-banded Bumblebee, Moss Carder Bee and Ruderal Bumblebee. Now recorded in areas not previously seen for between 5 and 25 years.
- Worked continuously with over 100 farmers and landowners giving bespoke advice across Kent and East Sussex.
- Set up fifty-four BeeWalks bumblebee monitoring transects to date.
- Improved management on 64 km of Bee Roads within Romney Marsh.
- Recruited 60 permanent volunteers who undertake a range of activities such as bumblebee and wildflower surveys, habitat management, public engagement and data entry.
- During the years 2009-2018 the project outreached to over 30,000 people.

People
- Between the years of 2009-2018 over 30,000 people engaged with the project through stalls, county shows, ID events, walks and talks.
- Four trainees were employed through the project with three now employed in the conservation sector and one still in post.
- Media coverage from all national newspapers to radio and TV interviews including Radio 4 and BBC Breakfast. Global coverage from USA, Europe and Australia.
- Over 120 training events including bumblebee identification (beginners, intermediate), wildflower identification training, and landowner and farmer training.
- Resources created include a ten-year project report https://www.bumblebeeconservation.org/wp-content/uploads/2017/06/Sub_T_Technical_Report_Feb_2020.pdf
- Each year our volunteers donate over 3,000 hours of their time to the project.

Challenges

- Very limited budget and the requirement for the project manager to raise an additional £8000 per year.
- Only one staff member employed (continuous).
- Attempting to reintroduce an extinct species has many challenges. Limited space and capacity to quarantine bumblebee queens in the quarantine facility. Small number of queens collected per year as agreed with the Swedish authorities.
- Difficulty in finding queens and evidence of establishment post release.
- Difficultly in identifying the Short-haired Bumblebee species.

Unsuccessful aspects of the project

We are very proud of the Short-haired Bumblebee project results, but some parts have proven difficult. There is no current evidence that the Short-haired Bumblebee has established in the UK. Every effort is being made to obtain evidence of establishment and tarsal clippings are being taken for DNA analysis of any putative sightings.

Natural capital

- The three rare bumblebee species most frequently encountered in the project area (Brown-banded Bumblebee, Moss Carder Bee and Ruderal Bumblebee) all show a trend towards increased abundance on sites where the project has carried out habitat advice and planting. The nationally rare Ruderal Bumblebee has increased most significantly, and Dungeness is now one of the best places in the country for the species because of the project's work. All three rare Bumblebee species have been recorded returning to areas where they had not been seen for up to 25 years.
- Better understanding of common and rare Bumblebee ecology, distributions, and populations.
- Improved floristic abundance, diversity, and flowering length on 2,460 ha across the project area.
- Raising public awareness of Bumblebees, pollinators and wildflower habitat across the project area.
- Changes in land management, operations and policies by 100 landowners including local authorities such as Kent Country Council, Environment Agency and local councils.

Monitoring / indicators

- Bumblebee monitoring was carried out using the standardised methodology 'BeeWalk' with data fed into the national dataset and published as an annual report.
- Monthly transect walks were conducted from March – October.
- Ad-hoc Bumblebee recording and BeeBlitz survey events with data fed into national recording schemes.
- Floral abundance and diversity surveys (% cover, seasonal forage availability and diversity).
- Selected case study sites/compartments had detailed botanical surveys.

Looking forward

- Sixty volunteers trained in bumblebee and wildflower identification with 52 BeeWalks currently being undertaken. All volunteers will still be engaged with the new Bee Connected project discussed below.
- Management plans for all landowners engaged by the project.
- Continuity of the work of the project will be achieved through ongoing involvement and delivery of actions through Kent's Plan Bee, other local authority pollinator strategies and other plans and policy work.
- Sustainable habitat creation across a landscape which has increased rare bumblebee populations.

Future projects:

Shrill Carder Bee Conservation Strategy 2020 – 2030

In response to the urgent need for a coordinated approach to ensure the conservation of this iconic bee, a conservation strategy for Shrill Carder Bee was launched in 2020. The strategy has been developed by a wide range of stakeholder and partners including BBCT, Buglife, RSPB, Natural England, NRW and BWARS with substantial input from other NGOs, academic institutions, government bodies and land managers. The strategy planning process included the development of a comprehensive species knowledge review and threat analysis. Loss and fragmentation of habitat is a key threat isolating Shrill Carder Bee populations in England and Wales. The Shrill Carder Bee requires conservation efforts at a landscape-scale and can be a flagship species for the restoration of a network of connected flower-rich habitats. Objectives of the strategy include developing local action plans and delivering and supporting new projects within the five remaining population areas of which Kent is a key stronghold and focus area.

Bee Connected 2022- onwards

Due to the success of the Short-haired Bumblebee project a new legacy project Bee Connected is being developed which carries on the most successful parts, such as habitat advice, working with volunteers and outreach. Grants will be applied for this over the next year.

Ten-year celebration event 2019 with BBCT staff, partners and volunteers

IMPROVING THE RIVER BEULT SSSI FOR PEOPLE AND WILDLIFE PLAN

Bridge Structure, River Beult.

Lead partners
Environment Agency and Natural England.

Partner organisations
Angling Clubs, Beult Catchment Improvement Group, Kent Wildlife Trust, Medway Catchment Partnership, Medway Flood Partnership, Medway Valley Countryside Partnership, South East Rivers Trust, and Southern Water.

District
Maidstone Borough Council, Ashford Borough Council

Description
A new holistic plan for restoration action on the 24.8 km River Beult SSSI was developed as part of the national programme of river restoration planning and implementation on SSSI rivers in England. This plan was led by the Environment Agency and supported by Natural England and the River Restoration Centre. The need was due to physical habitat degradation contributing towards an 'unfavourable recovering' SSSI condition status and the river failing to meet Water Framework Directive Objectives, i.e., to meet good ecological status and river flow targets. The River Beult has many physical barriers and modifications, as well as water quality challenges which supress its full potential. It is also Kent's only designated river, with a catchment area of 296 km^2.

The project has been working in partnership with local stakeholders, as part of the Medway Flood Action Plan, to understand what services the River Beult SSSI currently provides or supports and how these benefits for people and wildlife can be improved.

This partnership working has enabled the project to form a plan to improve the River Beult and to work with the community to put this plan into action to develop a more natural river and floodplain which are resilient to pressures including climate change.

The plan was supported by feasibility studies, flood modelling, geomorphological appraisal, and strategic stakeholder engagement. The timeframe from planning to publication was 2012 to 2018.

Habitat / species
Despite the physical modifications of the past, the river retains much of the characteristic flora and is one of the best type II clay rivers in England (however was in unfavourable condition). The plant community of the River Beult is typical of clay rivers associated with central England and unusual in South East England.

Funding
Funding was received from the Flood and Coastal Risk Management strategy produced by the Environment Agency. Work in-kind was also received from third parties, including 'third sector' partners such as the River Trusts and other organisations.

Key outcomes
- Creation of a new restoration plan for the portion of the River Beult, designated as a SSSI.
- Production of potential river restoration options and the feasibility of those within various flooding scenarios (including climate change).
- Increased awareness of the rivers' designated profile with local communities and key stakeholders.

People
The bulk of the people involved were organisational staff, volunteers, and community representatives from the partnership board. This could be said to involve as many as 100 people. It is hoped that future engagement will have much larger targets.

Challenges
- Securing future investment and landowner agreement to progress individual projects for barrier removal and restoration.
- Opportunities have been sporadic and sometimes unpredictable.
- The project would begin to focus delivery from upstream to downstream, but opportunities do not always occur in this order.

Evident nutrition issues

Unsuccessful aspects of the project

No aspects of the Improving the River Beult SSSI for People and Wildlife Plan were deemed unsuccessful.

Natural capital

The multiple benefits of delivering this plan will include:

- Benefits for flood risk.
- Water quality.
- Fisheries health and provision.
- Amenity benefits.
- Well-being benefits.
- Ecological resilience against climate change.
- Restoration of geomorphic processes.
- None have been delivered to date.

Monitoring / indicators

Implementation and monitoring requirements are yet to be realised, however when it does happen, a key focus will be to benefit the features of interest such as:

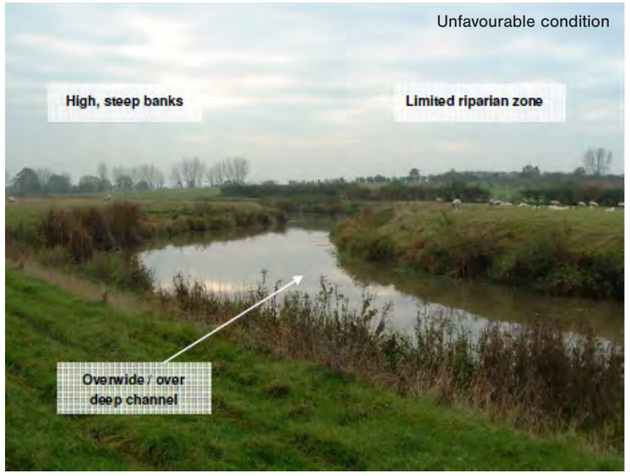
- Fish population surveys.
- Mapping geomorphic change over time.
- Wider biodiversity assessments.
- Improvement to floodplain habitat connectivity.
- Water quality elements (e.g., dissolved oxygen, temperature, sediment load, nutrients).

Part of the vision of the project is to incorporate involvement with the local communities, volunteers and many organisations in delivering this.

Looking forward

- Continue to implementation phase; establish a schedule of project board meetings.
- Secure external funding to progress engagement plans.
- Resume and carry out targeted and wider engagement plans to continue raising the profile of the SSSI river with key stakeholders, local communities, organisations, and local authorities. This will be developed in partnership with the Medway Catchment Partnership and Medway Flood Partnership.
- An update of the designated site condition status will be carried out.
- Develop the monitoring strategy and approach data gaps in baseline knowledge for ecology.
- Seek to secure opportunities through the planning process, for example influencing local plans and individual development proposals to implement elements of the plan.
- Relevant Environment Agency structures will continue to be reviewed for flood risk management function and whether environmental enhancements can be made.
- Continue to seek opportunities to increase the number of farming practices into complementary stewardship schemes (led by Natural England).
- Linking up the corridor through a landscape-scale based approach.

Unfavourable condition



More favourable condition

River Beult from Yalding Bridge © Copyright Deri James and licensed for reuse under creativecommons.org

GUARDIANS OF THE DEEP

Teach on the beach training

Lead partner
Kent Wildlife Trust (KWT)

Partner organisations
Kent County Council, Medway Swale Estuary Partnership, Natural England, Thanet Coast Project.

District
The Kent coastline from the Hoo Peninsula to Folkestone.

Description
The project's aims were to:
- Raise awareness of the existence and importance of Kent's marine environment and Marine Protected Areas, as well as the issues that affect them.
- Promote positive attitudes, values, and behaviours towards Kent's marine environment and Marine Protected Areas.
- Establish an active and ongoing guardianship role to protect Kent's marine environment and Marine Protected Areas.

The project was decided by discussions between the partners involved around the need to raise awareness/promote Kent's important marine environment. Following on from the discussions, an application was submitted to the National Lottery Heritage Fund in 2015 to secure development funding for the proposal. Due to the success of the application, the group carried out a gap analysis of existing public engagement in the marine environment, to identify target audiences, along with consultation work based on the gap analysis findings. Following a further successful application to the National Lottery Heritage Fund, delivery of the agreed project began in 2017 and ended in 2020.

Habitat / species
Kent's marine/coastal environment.

Funding
The project was funded by the National Lottery Heritage, with match funding provided by project partners.

Key outcomes
The project's key outcomes were:
- Increased awareness of Kent's Marine Conservation Zones (MCZs) and the marine environment over a large sector of Kent's population.
- The public have a better understanding of why the marine environment needs protecting and how they can help.
- The public have developed increased confidence to participate in marine conservation activities, which led to the development of self-sustaining activities.

People
The project involved working with:
- Primary schools around to deliver its WildBeach and Undersea Explorers programme.
- Members of the public, as part of our Coastal Guardians volunteer network, citizen science events/workshops and awareness raising activities as part of the Coastal Connections programme.

The number of people directly engaged through the project was 12,324, however a further 5,000,000 were engaged through exposure on the BBC's One Show.

Challenges
- The delivery of educational activities on beaches.
- Building successful relationships with the various schools/teachers involved with the delivery of WildBeach.
- Successful project promotion.

Unsuccessful aspects of the project
A key unsuccessful element of the project was within the delivery of WildBeach and the inclusion of activities focused around raising the profile of Kent's MCZs, as children found it difficult to understand the concept.

Main lessons learnt:
- The coast is traditionally thought of as a place for enjoyment, not for learning, meaning that future projects focused on the marine environment need to ensure that they focus on linking the two together.
- People are very enthusiastic about the marine environment, especially after issues such as marine plastics have been raised in the media, but they do need pointing in the right direction.
- Awareness raising and outreach activities need to be linked to practical opportunities to act.
- The beach provides a great place for environmental and heritage education, but teachers often lack the confidence to use it for this purpose. Providing resources and training is not enough to overcome their concerns, as they must experience it themselves in a supportive and guided way. Once they have had this experience, then resources and training play an important role in teachers taking forward the approach themselves.
- Training in topics such as species identification does not necessarily bring about increased confidence in the ability to use these skills as it often highlights how much there is still to learn. This has implications for the long-term sustainability of volunteering and citizen science initiatives as it suggests that learning opportunities need to be provided over a longer timeframe and ongoing support might be necessary until confidence is gained through practical experience.

Natural capital

A small element of the project included the control of the invasive non-native Pacific Oyster Magallana gigas on the Isle of Sheppey and Thanet.

Monitoring / indicators

The project was divided into five broad activity areas:

- Coastal Guardians – A self-sustaining network of community champions.
- Undersea Explorers – Exhilarating underwater experiences for children.
- WildBeach – Inspiring and challenging educational activities.
- Coastal Connections – A wide-reaching awareness-raising and events programme.
- Coastal Citizen Science - Essential conservation information, community-led.

Each activity area had its own delivery target and within each activity several milestones, for which updates were provided to the National Lottery Heritage Fund on a quarterly basis.

Looking forward

The project has helped to raise awareness of marine issues and inspired people in the local community and in schools. In particular, it has increased and widened the network of volunteering – through the Coastal Guardians/wardens around the North East Kent marine coastline (North East Kent Marine Protected Area). The trained volunteers remain the 'eyes and ears' of the coastline, helping to look after their 'patch' and report any issues to the relevant authorities.

Whilst there where some initial discussions amongst the partners following the end of the project, looking at developing a joint follow-up project, various circumstances have prevented further progress.

However, the Medway Swale Estuary Partnership has recently secured two years funding from Swale Borough Council to deliver its 'Wild Estuary' project, which incorporates several successful elements from the Guardians of the Deep project.

Families exploring the marine life in rock pools

ECOLOGY ISLAND MENTAL WELLBEING GROUP

Lead partners
North West Kent Countryside Partnership and North Kent Mind.

Partner organisation
Dartford Borough Council who provide the site on which the group operates.

District
Dartford Borough Council

Description
Ecology Island is a secluded woodland site in the middle of Dartford's Central Park, with the River Darent running alongside. The wellbeing group participants are referred into the project by North Kent Mind and are in recovery from mental health issues or emotional trauma. Each week they carry out conservation, bush craft and natural craft activities which not only improve the site for wildlife, but significantly benefit the mental wellbeing of the group. North Kent Mind staff are present each week to provide emotional support, and North West Kent Countryside Partnership lead the activities – each organisation plays to its own strengths to provide a fully-supported service.

Habitat
Secondary woodland and riparian habitats.

Funding
Various sources of funding including Porchlight, Public Health, KCC Members' Grants, DEFRA Wrap Fund, Saving Lives Innovation Fund, Darent Valley Landscape Partnership, Lawson Endowment Fund, and the NHS.

Key outcomes
- Wellbeing improvements for participants.
- Better managed woodland.
- Access and interpretation improvements.

People
The site is used and maintained by a group of approximately 12 people who are in recovery from mental health issues. Several of them have gone on to pursue further outdoor volunteering opportunities and one participant has gained employment in the countryside sector through this project.

Challenges
- Project funding is a constant challenge; no long-term funding solution has yet been found.
- The site is prone to antisocial behaviour and fly tipping which can be disheartening for the group, although their regular use of the site seems to have improved the issue.

Monitoring / indicators
Participant wellbeing is monitored using Warwick-Edinburgh Mental Wellbeing Scale questionnaires.

Looking forward
This successful project model has been expanded into other areas by North West Kent Countryside Partnership and other countryside partnerships, both with adults and children and young people.

A positive relationship between the group and Dartford Borough Council has developed, and the group is now also welcomed at Darenth Country Park as an alternative location when needed.

A long-term funding solution remains to be established.

Basket weaving in the sunshine on Ecology Island


Making Willow tunnels

FISHERIES MANAGEMENT FOR GOODWIN SANDS MARINE CONSERVATION ZONE

Lead partner
Kent and Essex Inshore Fisheries and Conservation Authorities (IFCA)

District
Kent

Description
The Goodwin Sands Marine Conservation Zone (MCZ) is a large (277 km^2) area of dynamic sand banks 6 km offshore from Ramsgate Harbour. The conservation objectives for Goodwin Sands is to recover the circalittoral rock and Ross Worm reefs to a favourable condition. The aim also includes to maintain the subtidal sand and coarse sediments, the Blue Mussel beds and the outburst flood features in a favourable condition.

As part of Kent and Essex IFCA's role to further the conservation objectives of the new MCZ, management is required for fishery activities that may impact on these designated features. The location of most features in the MCZ are well understood, but Sabellaria is relatively ephemeral and consequently a better understanding of the core areas occupied by the species was required. Kent and Essex IFCA in partnership with Natural England are carrying out surveys to improve understanding of the spatial distribution of Sabellaria, which in turn will help to inform spatial management plans for the MCZ. This is a new project and is currently in progress. The project is being undertaken with close collaboration with the Goodwin Sands Conservation Trust and local fishermen.

Habitat / species
Designated habitats of the MCZ include:
- Ross Worm reefs.
- Circalittoral reefs.
- Blue Mussel beds.
- Subtidal sand.
- Coarse sediments.

The MCZ also includes an area of mixed subtidal sediments.

Funding
Kent and Essex IFCA carried out the surveys using internal funds and were supplemented by co-funding from Natural England.

Key outcomes
The key outcomes have so far included:
- A better understanding of the spatial distribution of Ross Worm reefs.
- Improved management for the MCZ which enables increased protection of the designated features.
- Increased involvement from the local community which enhances portion value.

People
There are a range of local people involved with the project which includes sailors, divers, archaeologists, fishermen and conservationists.

Challenges
- The Goodwin Sands MCZ is a dangerous area to survey, known for wrecking ships.
- Stakeholder negotiations for implementing management.

Unsuccessful aspects of the project
No aspects of the project were deemed unsuccessful.

Natural capital
- Ross Worm reefs are associated with higher levels of biodiversity.
- Better protection of the MCZ and features that enhance biodiversity has shown to increase fish abundance and can contribute to greater fish landings outside of the MCZ through the overspill effect that it creates.
- Food production, economic and wellbeing.

Monitoring / Indicators
The last surveys for Sabellaria in the Goodwin Sands MCZ were carried out by CEFAS in 2014.

Looking forward
Since the surveys in 2014, no condition assessments have been undertaken for the habitats. Future surveys will therefore provide critical insight into the state of this important biogenic reef building habitat.


IFCA Staff completing surveys off the Kent coast

IFCA Staff heading out to complete a Goodwin Sands Survey

WESTBERE MARSHES RESERVE

Westbere Marshes Reserve Reedbeds

Lead partner
Wild Spaces Fund (WSF)

Partner organisation
Kent Wildfowling and Conservation Association (KWCA)

District
Westbere Marshes, Canterbury

Description
In 2006, the KWCA purchased the freehold of 40 ha of reedbed at Westbere Marshes. The KWCA now owns approximately 11% of all reedbed habitat in Kent. The area had been neglected for many years, with mature crack willow and scrub developing across much of the site, especially close to the River Stour which forms one boundary of the marshes. Mist-netting surveys to ring birds had historically been carried out on site, and over time a preponderance of woodland birds were being caught.

The aim of the project was to restore the reedbed for its associated species, and for the bird ringing records that are returned eventually to begin to show this change. Significant capital funds were drawn down from Natural England which enabled the removal of crack willow and scrub, together with improvements to the ditch system which was in very poor condition. Associated with this was ongoing work by volunteers, initially from the KWCA but following the KWCA created WSF as its registered wildlife charity, a new group of volunteers called Friends of WSF. There was an initial 10 year stewardship scheme, which has since been extended.

Habitat / species
- Reedbed (Phragmites) habitat.
- Reedbed bird species, including creating conditions suitable for Bittern and Marsh Harrier.

Funding
The 40 ha site was purchased by the KWCA in 2006 and was entered into ELS/HLS schemes for reedbed and fen restoration and management. Initial funding was by the KWCA, with substantial HLS capital funding of circa £40,000 from Natural England.

Key outcomes
The key outcomes included:
- Successful reedbed management on site.
- Scrub and crack willow clearance.
- Ditch restoration.
- Species restoration – reedbed species such as various warblers, Marsh Harrier and Bittern.

The scrub clearance and reedbed management are still ongoing projects.

People
People involved were members of the KWCA and Friends of WSF, usually with small groups of fewer than ten.

Challenges
- Acquiring adequate funding for the project.
- Reedbeds are notoriously difficult to manage due to wet terrain and vigorous annual growth.

Unsuccessful aspects of the project
- The initial disposal of very large Crack Willow trees and their roots was a problem. This was eventually overcome by working with contractors and by trial and error on site.
- Management of the reedbed has proven even more challenging with the advent of a small population of Beaver that have damaged many of the access routes through the reedbed.
- The reedbed has not been managed for a significant length of time, consequently the dense ground litter made access and management very difficult.

Natural capital
- Restoration of reedbed habitat.
- Return of traditional reedbed species such as Reed Warbler, Sedge Warbler, Reed Bunting and Bearded Tit.

Monitoring / indicators
- Progress on delivering the HLS prescriptions.
- KWCA and Natural England monitoring of the capital spend on restoration and improvement.
- Changes in bird species numbers and distribution.

Looking forward
The work is still ongoing. Reedbed management is set out in the HLS prescription which calls for the rotational management of small areas of reedbed. The learning from this ongoing project will be used on other WSF/KWCA sites.

Post some capital works

BREEDING WADERS IN NORTH KENT

Redshank *Tringa totanus*
© Peter Cairns 2020Vision

Lead partner
Multi-partner approach

Partner organisations
Canterbury City Council, Elmley Conservation Trust, Environment Agency, Farmers, Kent Wildlife Trust, KWCA, Natural England, RSPB, and Swale Borough Council.

District
Gravesham, Medway, Swale, Canterbury

Description
Breeding waders have suffered dramatic declines in the UK and most of their important breeding habitat, grazing marsh, has been lost in Kent. Targeted agri-environment schemes and large-scale habitat creation and restoration projects have led to significant population increases for Lapwing and Redshank on the North Kent Marshes. Due to the efforts of a wide range of organisations and individuals over the last 30 years, the extent of well-managed grazing marsh has increased by at least 1,800 ha since the 1980s, with an additional 228 ha of restoration planned in 2021-22 at Seasalter. Some of the more significant changes include:

- Elmley is now the only family owned and managed National Nature Reserve in the UK. In the 1980s, Elmley converted 485 ha of arable back to grassland which, along with the restoration of the existing grazing marsh on the estate, has delivered new habitat for hundreds of pairs of breeding waders.
- From the 1990s, the RSPB and Environment Agency created and restored an additional 720 ha on the North Kent Marshes, including the award-winning habitat creation project at Great Bells Farm, Northward Hill, and Higham Marsh.
- The North Kent Breeding Wader project is an advisory project lead by an Ecological Consultant in partnership with NE, farmers, and the RSPB. The project delivers advice on breeding waders to land managers, undertakes ecological surveys and develops capital works projects.
- Evolving and improving responses to the impacts of predation. Many sites now have anti-predator fencing that have helped reduce the impacts of mammalian predation and allowed breeding waders to successfully fledge more chicks.

Driven by these improvements, the breeding wader population on grazing marsh in Kent increased by 316 pairs between 1982 and 2002 (Breeding Birds of Wet Meadows Survey), resisting the national trend and demonstrating positive change on a landscape scale. Land managers are continuing to collaborate and increase the extent of well managed wetlands, so this continued population trend is expected to be confirmed by a national survey planned for 2021.

The number of Lapwing pairs on Elmley and the North Kent Marshes RSPB reserves in 2019 totalled 577 – more than the entire Kent population on grazing marsh in 1982.

Habitat / species
- Coastal grazing marsh – a Kent Biodiversity Strategy priority habitat.
- Breeding Lapwing (a Kent Biodiversity Strategy priority species) and Redshank.

Funding
Funding from Countryside Stewardship/HLS/ ESA, Environment Agency, EU LiFE, Green Recovery Challenge Fund, Nature Improvement Areas and the RSPB.

Key outcomes
Increased populations of breeding waders between 1982 and 2002 (and continuing to increase for the 2010 survey):
- Lapwing pairs increasing from 472 to 650.
- Redshank pairs increasing from 38 to 176.
- Increased wader productivity on key sites on the North Kent Marshes, with the number of fledged chicks per pair regularly more than the 0.7 required to maintain a stable population.
- Increased extent of well-managed grazing marsh by at least 1,800 ha since the 1980s.

Challenges
- The impacts of climate change will be highly significant for breeding waders in Kent. Predicted warmer and drier summers will make it increasingly difficult to maintain surface water pools during the breeding season that chicks rely on for feeding. Competition for water resources with other users, including residential developments, will put further pressure on water supplies for wetlands.
- The impact of predation on wader productivity continues to be challenging.

Unsuccessful aspects of the project

A small breeding population of Black-tailed Godwits now appears to have been lost from the North Kent Marshes.

Natural capital

A landscape of healthy grazing marsh will deliver flood relief, increased water quality, reduced nutrient inputs and increased wellbeing for people who live around the estuary.

Monitoring

Intensive monitoring of breeding waders and other key species is carried out annually by the RSPB and Elmley Conservation Trust. In addition, a 10 yearly national survey is carried out as part of the Breeding Birds of Wet Meadows Survey.

Looking forward

Land managers will need to continue to deliver the Lawton principles on grazing marsh and we will need to work together across sectors to ensure that the new ELM scheme delivers good outcomes for breeding waders. We will need to adapt to changing climate and ensure that water is used wisely across the landscape.

Lapwing *Vanellinae*
© Mark Hamblin 2020Vision

OLD CHALK NEW DOWNS (OCND)

Condition assessment at Boxley

Lead partner
Kent County Council (Natural Environment and Coast Team)

Partner organisations
Buglife, Countryside Partnerships, Kent Downs AONB, Kent Wildlife Trust, Kent County Council (PROW Team), National Trust, Natural England, Plantlife and Tonbridge & Malling Borough Council.

District
Kent North Downs between Otford and Detling.

Description
The project aims were to:
- Improve, restore, and reconnect threatened chalk grassland habitats and other habitats of the Kent Downs.
- Address the loss of people's connection with their natural environment and lack of knowledge and understanding of the value of their heritage.

The 2011 report 'The State of Kent's Wildlife' illustrated that during the last century Kent has seen major losses in wildlife and many of the species that remain have undergone large population declines. In 2014, members of the Kent Biodiversity Partnership selected the 10,000 Ha OCND project area as one of the first large scale ecological networks to be established in the county. A pilot study was undertaken to gauge interest and build contacts. The main project was to be delivered over four years (2017 – 2021). The project has since had a nine-month extension agreed and will now run until the end of May 2022.

Habitat / species
Chalk grassland and other downland habitats e.g., beech/yew woodland.

Funding
The project was funded by the National Lottery Heritage Fund (NLHF), with match funding provided by project partners.

Key outcomes
The project's key outcomes include:
- Improved, restored, and reconnected chalk grassland habitats and other habitats of the Kent Downs across the project area.
- Increased access in suitable areas of the project area.
- Increased awareness of the chalk downland habitats, specifically the historical and botanical importance of chalk grassland.

People
The project involved people through:
- Educational workshops for primary schools on the downs and in school grounds. A school pack was produced for teachers to carry out self-guided activities.
- Traineeships and bursaries for higher education students and recent graduates to support their studies and the transition into the workplace.
- Continuing Professional Development (CPD) training for landowners, students, conservation organisation staff and other people volunteering and working within the environmental sector. This will increase the overall skill set in the area, support the capital works of the project, and ensure maintenance is continued beyond the project's end.
- Public awareness raising for chalk downland through events, presentations, guided walks, and interpretation.
- Volunteer opportunities focused on the ongoing monitoring of sites, and promotion of voluntary groups within the project area.

Final numbers are not yet available as the project is ongoing. Currently, all areas of engagement are predicted to meet their targets, with volunteer engagement expected to well exceed the target hours.

Challenges
- The Covid-19 pandemic prevented activities and engagement as well as hindering the ability to connect with certain demographics of the OCND community.
- The length of time between the end of the pilot study and start of the main project resulted in some staff and landowner changes. As a result, a proportion of the initial engagement and progress made during the pilot phase was lost.

Cobham Wood pond installation

Unsuccessful aspects of the project

Unsuccessful aspects of the project include the low uptake of the student bursary scheme and successful promotion of the project.

Lessons learnt:

- Due to the targeted nature of the project (primary focus on chalk grassland, remote project area), many students did not meet the bursary specifications. This resulted in the development of the traineeships and alteration of the student bursaries, giving broader access.
- As the project developed, the capacity within the team did not allow enough time for marketing and promotion. This has been addressed through additional administrative support from partners and a focus on higher quality content.
- A challenge inherent in key habitats in the project area is that they are steep and difficult to access, often resulting in engagement events held in hard-to-reach areas. Better engagement materials were required when it was not possible to engage audiences in target habitats. To help balance this, events focusing on moving through the environments (guided walks) has improved the project's reach.

Natural capital

- Habitat creation and restoration of chalk grassland and lowland meadow habitat across more than 20 sites within the project area.
- Habitat creation and restoration of additional downland habitats including ponds and ancient woodland at seven sites within the project area.
- Hedgerow restoration via 'gapping-up' of historical hedgerows and planting of new hedgerows within flood-risk areas. Approx. 5000 m of hedgerow will be planted in total.
- Access improvements along public rights of way has enabled better access for the public.
- Landscape protection improvements to combat anti-social behaviour such as robust fencing is helping to prevent habitat encroachment caused by fly-tipping, illegal off-roaders and poaching.

Monitoring / indicators

The project was divided into activities and capital works. Activities were primarily monitored by the level of engagement and feedback forms. The capital component of the project has been monitored through fixed point photography and chalk grassland condition assessments, hedgerow surveys and site monitoring. All of these have been recorded and updates are provided to NLHF on a quarterly basis.

After Cobham Wood pond installation

Looking forward

Grant-funded capital work includes a 10 year agreement with the recipient of the funding to maintain any works and management practices supported by the project. To help land managers do this, training has been provided for habitat monitoring. In addition, several butterfly transects have been set up on project sites, which the landowners have agreed to take on and there are already volunteers in place to continue monitoring.

Apart from the increased awareness through the schools and activities programme the project has also built partnerships with organisations which will continue components of the work. Networking, introductions and mentoring for landowners/ managers and graziers/volunteers has ensured that management and monitoring can also continue to develop.

One of the biggest legacies the project has created is through the training and traineeship programmes. Recipients of the training now have a broader skill set for the workplace which will better support the sector and management of the project area. One of the trainees supported by the project has now gone on to full time employment with Kent County Council within the Natural Environment and Coast and has been using the skills gained during their traineeship to support their work.

Overall, the project to date has been successful and with 10 months left it will continue to integrate legacy opportunities into all our works.

Kent Downs AONB © Andrea Don @pixabay

MEDWAY NATURAL FLOOD MANAGEMENT (NFM) PROJECT

Church Woods NFM structure

Lead partner
South East Rivers Trust

Partner organisations
Environment Agency and Maidstone Borough Council

District
Maidstone Borough, Tunbridge Wells Borough (River Medway catchments).

Description
This project was one of the national EA Natural Flood Management (NFM) pilot projects partnering with the South East Rivers Trust as well as being part of Medway Flood Partnership.

Aiming to use natural woody structures and water management techniques to slow and store water to reduce flood risk and enhance the environment. The project took place 2017-2021.

The project sites were:
- On the Alder Stream upstream of Five Oak Green.
- Bedgebury Forest.
- Sissinghurst Castle estate.
- The School Stream, a tributary of the River Beult, upstream of Headcorn.

Habitat / species
Headwater streams, ancient woodland, lowland meadow, ponds.

Funding
- Funders included Defra £15 million NFM pilot fund (led by EA), EU FRAMES funding, & Maidstone Borough Council.
- RSPB, National Trust, Forestry Commission provided land and staff time.
- Supported by KCC, NE and others.

Key outcomes
- Enhanced 7 km of stream.
- 11 ha of woodland fenced off from livestock to restore the ground flora.
- 1 ha of woodland creation (natural regeneration buffer around ancient woodland sites).
- Two ponds created and one pond restored.
- 2.3 ha of lowland meadow created.

People
- The project was promoted to the local community.
- Landowners provided their land helping to raise the profile of NFM.
- Local community representatives attended site visits.
- Volunteers helped install many of the features in Bedgebury Forest.

Challenges
- No long-term maintenance funding.
- Delivery timeframe was short, although the project received a last-minute extension of one year.

Unsuccessful aspects of the project
The project aimed to reach more landowners and a greater total length of watercourses. Time, resources, Brexit, and a lack of long-term maintenance funding meant this proved difficult.

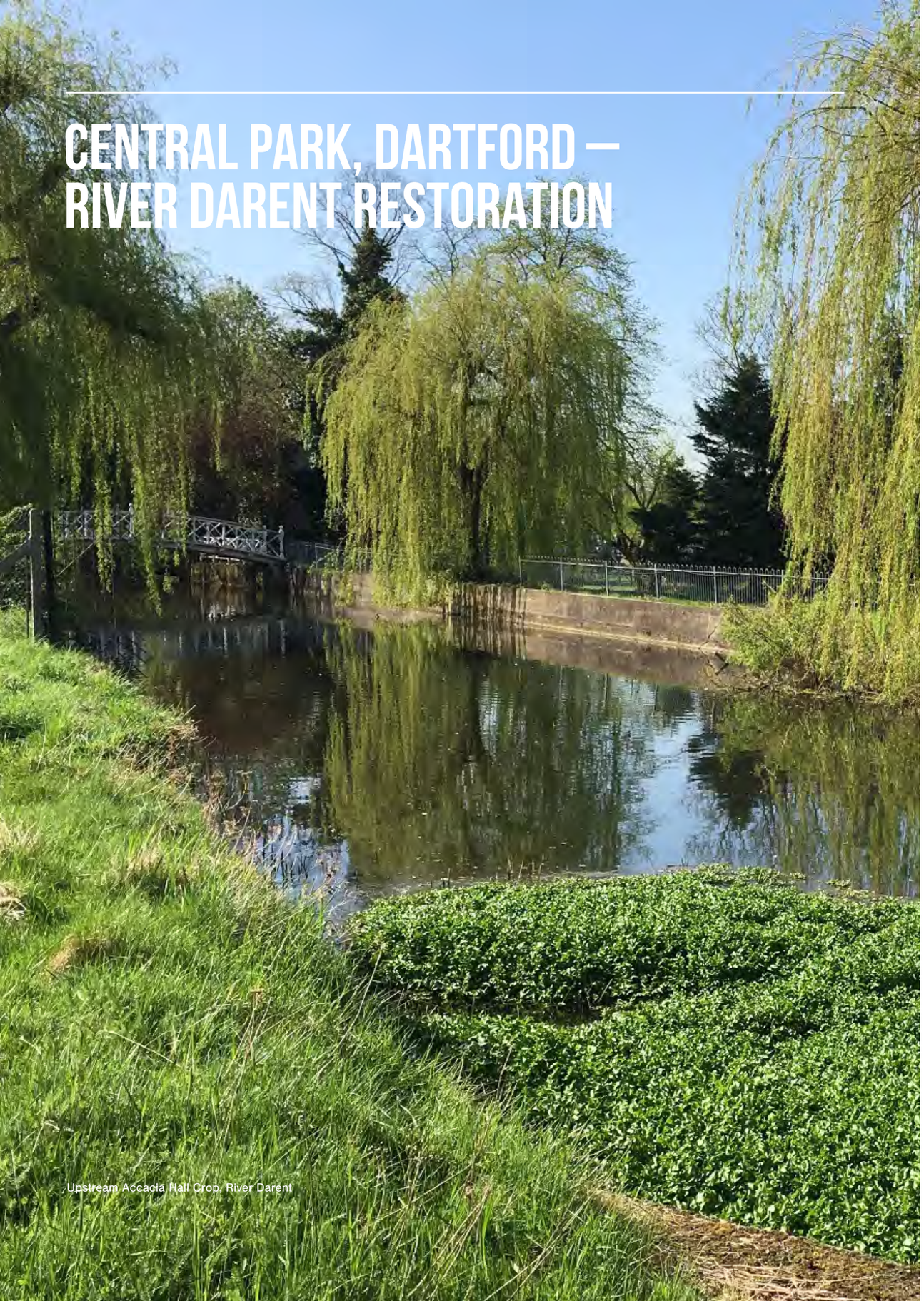
Main lessons learnt:
- Creating storage and small-scale interventions are possible and provide multiple benefits.
- Scaling the project up over larger catchments would be possible with more money.
- With farm-scale maintenance funding much more would be possible.

Natural capital
- Increased infiltration of water into soil.
- Improved soil in woodland areas, less impacted by forestry and farming.
- Flood risk reduction.
- Habitat provision for wildlife, including pollinators.

Monitoring / indicators
- Number of hectares of habitat created and restored.
- Length of watercourse improved.
- Number of properties potentially benefiting from reduced flood risk.

Looking forward
Medway NFM remains a key part of the Medway Flood Partnership and partners will aim to continue to promote it and secure more funding to achieve multiple benefits. It is hoped that in the future ELMs, coupled with this experience, will help to target areas that will achieve the most benefits for local communities and the environment.

CENTRAL PARK, DARTFORD – RIVER DARENT RESTORATION



Upstream Accacia Hall Crop, River Darent

Lead partners
South East Rivers Trust and Dartford Borough Council

Partner organisation
Environment Agency

District
River Darent, Dartford Borough Council

Description
Restoration of the River Darent (chalk stream habitat) in Dartford Central Park and Acacia Hall. The main project aims were:

- Restoration of 700 m of chalk stream habitat.
- To enable fish passage through the park.
- Remove culvert and a section of concrete channel and weir.
- Restore the setting of Acacia Hall mansion.
- Improve public engagement with the River Darent.

The partnership was formed in 2016, and the project took nearly 5 years to complete.

Habitat / species
Chalk stream, a Kent Biodiversity Strategy priority habitat.

Funding
Funders included Dartford Borough Council, Environment Agency and Veolia Landfill Grant.

Key outcomes
- Restoration of 700 m of chalk stream habitat.
- Fish passage enabled through the site.
- Safer/improved river environment for park users.
- Improved setting for Acacia Hall mansion.

People
- The idea for restoring the river was promoted to Dartford Borough Council officers and Councillors, which was essential for gaining approval and funding. We continued this engagement throughout the pre-construction and construction phases.
- Local community volunteers led by SERT helped with river clean-ups and planting new marginal species following the main construction work.
- Local community talks and exhibits on the project at public events were essential to raise awareness that the appearance of the river would be changing as a weir was being removed.
- The project was promoted online and at community events as one of the river channels needed to be dry during the construction period, so that the concrete bank, bed, and weir could be removed.

Challenges
- The wider project included demolishing a building built over the river, restoring historic buildings, rebuilding bridges, improving car parking and landscaping, and better pedestrian access through the site. The river improvements were only one part of this large project, but there were delays in delivery which inevitably meant funding and timings had to be flexibly managed.
- The project had to ensure flood risk was neutral or better following the work. However, last minute changes to the design of the upstream flow control structure were needed to reduce project costs.
- The COVID-19 pandemic, with lockdowns and furloughed staff meant there were delays in completing the river enhancement works.

Unsuccessful aspects of the project
- Still too shaded down parts of the river, further tree management would benefit the in-channel habitat, and an ongoing programme is required.
- The coir matting wasn't correctly installed in parts of the new channel, so remediation might be needed, depending on whether the vegetation can quickly spread to protect the new banks.

Natural capital
- Improved water quality for 700 m of chalk stream habitat with more wildlife.
- Restoration of chalk stream habitat – highly threatened and rare worldwide.

Monitoring / Indicators
- The length of chalk stream habitat restored.

Looking forward
- Further work on the site would be beneficial to improve how park users engage with the river, to improve views and experiences.
- Further tree work would ideally take place to open the river up to more light. The non-native tree species create a particularly heavy shade.

The success of the project will encourage further river restoration, particularly for urban parts of Kent. It is a flagship project that will help promote restoring and protecting chalk rivers for the benefit of local communities and biodiversity.

GREAT BELLS FARM

Lead partner
Environment Agency and the RSPB

Partner organisation
Bumblebee Conservation Trust (BBCT)

District
Swale

Description
The creation of 193 ha of coastal flood plain and grazing marsh habitat on a former arable farm on the Isle of Sheppey. Due to sea-level rise, coastal flood plain and grazing marsh habitat is increasingly under pressure as it becomes squeezed up against sea wall defences around the Kent coast. These habitat losses were identified in the Medway Estuary and Swale Shoreline Management Plan (MEAS SMP) and the Environment Agency has developed plans to compensate for these losses elsewhere in the estuary. In future, this may involve the re-alignment of flood defences to allow the estuary to 'breathe', but this could be at the expense of coastal flood plain and grazing marsh behind the sea wall. This is where the Great Bells Farm project comes in.

Great Bells Farm was purchased by the Environment Agency to provide new grazing coastal flood plain and grazing marsh habitat to replace predicted future losses. The Environment Agency commissioned the RSPB to design and build the new wetland habitats due to their experience of designing and managing wetlands, such as at Medmerry and Wallasea. The project was awarded the Chartered Institute of Ecology and Environmental Management (CIEEM) 'NGO Impact Award' in 2014. The RSPB and Environment Agency worked closely together to produce a design that would capture the best elements of coastal flood plain and grazing marsh sites that are valuable for wildlife. The design needed to incorporate three main elements:

1. Livestock infrastructure, such as gates and cattle handling facilities, so that the site could be appropriately grazed.
2. Predator exclusion fencing around the key areas, so that ground-nesting birds would be able to produce enough chicks to maintain their populations, something which is a particular issue for breeding waders.
3. Hydrological infrastructure, such as dams, sluices, and rills (surface features that hold water) to enable the wetland element to be created.

The last of these, the hydrological infrastructure, was potentially the most difficult and costly, so the project used LiDAR and digital mapping to ensure that: water could be held within the site; to ensure that water could be managed in the most efficient way; that there would be enough surface water to attract breeding waders; and that the spoil that would be created could be managed in the most efficient way. The plan also incorporated additional habitat for water vole and bumblebees as part of the Buzz for the Coast project. For the site to be effective as a wetland, water levels needed to be safely managed at a higher level than surrounding farmland, so an automatic pumping system was installed, designed to reduce staff resource required to manage water levels. This digital map was then used to guide the GPS equipped machinery on site to create a near-replica of the plan on the ground. All excavated material was reused on site.

Habitat / species
Coastal and floodplain grazing marsh.

Funding
Great Bells Farm was purchased by the Environment Agency. The ongoing project is co-funded by the Environment Agency and the RSPB.

Key outcomes
- In 2010, the site had one pair of Lapwings and seven pairs of Redshanks breeding on site. By 2019 this had increased to 51 pairs of Lapwings and 45 pairs of Redshanks.
- Thanks to the anti-predator fence, Lapwing chick productivity has been well above the level required to sustain the population for seven consecutive years (i.e., greater than 0.7 fledged chicks per pair). This means that Great Bells Farm is putting more Lapwings back in to the world.
- Wintering waterfowl numbers have also increased, with the site regularly holding large flocks of Wigeon, Teal, Curlew, and Golden Plover.


Black oil beetle *Meloe spp*

Avocet *Recurvirostra* and chick


Lapwing *Vanellus vanellus* and chicks

- The Maid of Kent Beetle, known only from two locations in the UK previously, has now been found on Great Bells Farm. This large rove beetle is a predator of dung invertebrates and needs chemical-free cow pats to prosper.

Challenges

There are several issues and learning points involved with a project of this type, including:

- The site was close to a former World War II air base and the presence of unexploded ordnance (UXO) was discovered prior to excavation. Because of this, we had to closely monitor UXO during the excavation phases of the project using magnetometer surveys, specialist site investigation and army specialists.
- There is a lot of history around the Thames, and the project was careful to ensure that we took steps to avoid damaging local archaeology.

Unsuccessful aspects of the project

No aspects of the Great Bells Farm project were deemed unsuccessful.

Natural capital

The hydrological design of this project makes the best use of available freshwater supplies and increases the resilience of coastal flood plain and grazing marsh habitat in the wider landscape to the impacts of climate change. Converting arable to coastal flood plain and grazing marsh reduces nutrient inputs into the SPA, helping to deliver nutrient neutrality.

Monitoring / indicators

- Pairs of breeding Lapwing.
- Lapwing breeding productivity.
- Water Vole populations.

Looking forward

Great Bells Farm will continue to be managed for nature and will increase in quality over time as soil structure and topography develop further.

Nesting lapwing on Great Bells Farm © Phil Haynes

SHINGLE ON THE CUSP

Yucca Clearance Work July 2021
© Will Langdon

Lead partner
Kent Wildlife Trust (KWT)

Partner organisations
EDF Energy, Kent & Medway Biological Records Centre, Ministry of Defence (MoD), Natural England, Romney Marsh Countryside Partnership and RSPB.

District
Dungeness shingle promontory and coastal shingle areas.

Description
The project which is part of wider conservation work on Romney Marsh has the following main aims:

- To test the use of brash piles as a method for increasing the speed of plant and invertebrate colonisation of bare shingle.
- To improve shingle habitat, bare shingle will have increased native plant coverage and increased invertebrate assemblage abundance and diversity.
- To educate landowners and conservationists on bare shingle restoration techniques.
- To educate people living locally about garden plants which can be invasive in shingle habitats.
- To reduce the burden of invasive non-native species in shingle habitats.

Much of the unique vegetated shingle habitat in the area has been either completely lost or severely degraded. This is due to development, historic conversion to arable farmland, gravel extraction, visitor pressure, military activities, flood defence works and invasive species encroachment.

Brash was piled at different heights (60 cm, 120 cm, 180 cm) in bare shingle plots on RSPB and MoD land to assess the impact of each level of the treatment on the speed at which plants and invertebrates colonise the bare shingle substrate. These plots are monitored annually for vegetation colonisation from 2018 for at least five years. Changes in invertebrate species assemblage are also monitored via pitfall trap surveys in 2018, 2020 and 2021.

In addition, invasive species such as Red Valerian *Centranthus rubra* and Sea Buckthorn *Hippophae rhamnoides* are being controlled through hand-digging, spraying and mechanical removal. Leaflets and web content were also produced and distributed to raise awareness amongst local residents about ways in which they can help to protect shingle habitats.

Habitat
Vegetated shingle.

Funding
National Lottery Heritage Fund (Fifth Continent Landscape Partnership Scheme) and match funding.

Key outcomes
- Bare shingle in research plots now has increased native plant coverage.
- Methods for increasing rate of colonisation on bare shingle through use of brash piles are better understood.
- Local people educated about problem garden plants, by production and distribution of 'Gardening by the Sea' and 'Shingle Plants' leaflets.
- The burden of invasive species on shingle habitats (*Centranthus rubra* & *Hippophae rhamnoides*) has been reduced on 8 ha of land.

The monitoring of the impacts of this project is long-term and so complete results will not be available for another five years. Initial results show that brash piles in the research plots are positively impacting rates of plant colonisation. Invasive species clearance work has progressed well, and areas have been improved for native wildlife.

People
People are involved in this project in various ways, including:
- Land managers have access to better advice from research plots.
- Kent Wildlife Trust and RSPB volunteers setting up research plots.
- New resources (online and printed) have been produced and distributed to local residents on how to protect shingle habitats.

Clearance of Sea Buckthorn *Hippophae Rhamnoides* in Spring 2021

Challenges

Shingle vegetation develops very slowly and is highly susceptible to disturbance so the research plots must run for at least five to 10 years.

- Lack of funding to continue invertebrate surveys beyond two seasons so dataset will be truncated.
- Issues with partner engagement in monitoring research plots.

Unsuccessful aspects of the project

- The initial plan was to trial using various substrates including coir fibre, brash and matting for the research plots. However, it was decided that installing any of these under the shingle involved too much disturbance and so did not proceed.

Main lessons learnt:

- Long-term partnership is vital for monitoring project impacts.
- Engaging with landowners for whom conservation may not be a priority can be very challenging.
- Public awareness raising requires more effort than was anticipated by the project.

Natural capital

The work to remove invasive plant species has significantly improved the shingle/sand habitats, providing an opportunity for greater spread of specialised native flora adapted to them. Ensuring these scarce habitats are conserved and expanded will be aided by findings from the research.

Monitoring / indicators

- Yearly monitoring of changes in abundance and diversity of pioneer shingle species i.e., Nottingham Catchfly, Wood Sage, Sheep's Sorrel.
- Monitoring of invertebrate assemblage associated with different brash pile heights via pitfall trapping in 2018 and again in 2020/21.
- Areas of land cleared of invasive species and assessment of re-growth of these species.

Targeted clearing of invasive species Red Valerian, *Centranthus rubra*

Looking forward

Surveys of the pioneer vegetation colonising shingle in each of the different research plots / brash treatments will be continued by the RSPB on the Dungeness reserve in future years to build on survey data from the first three years post-installation. The RSPB will collate this data, draw conclusions, and share this information with interested parties. Other agencies, notably the Environment Agency, have expressed interest in the research findings to support their decision making to ameliorate damage caused when undertaking coastal works on shingle.

Project partners, most noticeably the Romney Marsh Countryside Partnership and RSPB will continue efforts to reduce or eradicate invasive species.

Yucca Clearance Work July 2021
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