

SANCTUARY

THE MINISTRY OF DEFENCE SUSTAINABILITY MAGAZINE

NUMBER 52 • 2023



SANCTUARY

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Front cover image

A great pondhawk, *Erythemis vesiculosa* dragonfly, taken by an Army photographer during Ex Mayan Storm in Belize © Crown (Photographer Corporal Danielle Dawson).

Back cover image

Soldiers are briefed before a live firing range in the jungle on Ex Mayan Storm in Belize. Personnel were training in the jungle environment to test out their soldiering skills in a harsh setting, while also conducting firing ranges and adventurous training. The British Army Training Support Unit in Belize enables close country and tropical training to troops from the UK and international partners. Practices like this are used to teach our soldiers how to survive, live, and fight in the jungle environment © Crown (Photographer Corporal Danielle Dawson).

Special thanks go to Harvey Mills Photography for his ongoing support in the provision of images for use in the magazine.

Sanctuary magazine is produced for the MOD by the Defence Infrastructure Organisation and is printed on FSC certified paper as a minimum.

Editors' message

Some bold changes were made to the look and feel of *Sanctuary* 51, 2022 – thank you to everyone who got in touch to let us know what you thought. Your responses have informed the tweaks to this edition, and we hope you like the results.

Are you interested in writing an article for the next edition of *Sanctuary*? We are going to leave our online submissions portal (<https://sanctuary.awardsplatform.com>) open for synopses all year round, so you can send your ideas to us whenever inspiration strikes! We will still send out calling notices for Sanctuary Awards in the usual way too.

There have been Conservation Groups on the MOD estate for nearly 50 years (p.42). They act as stakeholder engagement forums for facilitating conservation activities and generally have a core of dedicated volunteers. Conservation Groups are invaluable on any site and are mandatory under JSP 850 on sites with statutory designations. You can read about the types of activities Conservation Groups undertake from p.89. If you are thinking about setting up a new group, you can find information on where to start on p.88. We can offer new and established groups support, advice and even funding for some projects too – just e-mail DIO-conservationgroups@mod.gov.uk

The articles published in *Sanctuary* are penned by authors who volunteer their contributions. Thank you to all of our authors for the fantastic articles sent to us for this 52nd edition of the magazine.

The Editors

Sponsors

We would like to say a big thank you to our sponsor – their continued support with the printing process, which allows limited copies of this iconic magazine to be printed, is much appreciated.

The logo for CDS (Creative Design Studio) features the lowercase letters 'c', 'd', and 's' in a bold, rounded, sans-serif font. The 'c' and 'd' are connected at the bottom, and the 's' is positioned to the right of the 'd'.

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Foreword

by **The Earl of Minto, Timothy Minto**
Minister of State for Defence in the Lords

Welcome to the 52nd edition of *Sanctuary* magazine, showcasing for Defence and inspiring ingenuity and innovation across a fascinating range of sustainability and conservation projects.

As Minister of State for Defence, it is a huge privilege to take on this role and to follow in the footsteps of Baroness Goldie who has done such a superlative job. As the global impact of climate change continues to affect the security and stability of countries around the world, I remain very proud to be able to showcase our sustainability work, sharing ideas and learning with the UK Government and with overseas partners and Allies.

Sustainability and conservation are not anything new for Defence. It is 50 years since the 1973 Report of the Defence Lands Committee (yes there was life before the Defence Infrastructure Organisation!) highlighted how we needed to do more for our environment, heritage and access (p.42), and *Sanctuary* has been celebrating our progress for almost as long. So many projects have remarkable longevity, like the Owl and Raptor Project on Salisbury Plain Training Area which celebrated its 40th anniversary in 2023 (p.15).



The Earl of Minto,
Minister of State for
Defence in the Lords
© Crown

“Sustainability and conservation are not anything new for Defence.”


Much of the MOD estate is designated as a haven for wildlife, and Woolmer has been nationally recognised as a natterjack toad translocation donor site (p.76).

We also undertake conservation overseas, as illustrated by the Kenya Fence Line Project (p.50). The Defence Infrastructure Organisation’s Environmental Management and Assessment team are key to the delivery of many such projects, and I am a bit envious of some of the amazing places they get to work (p.84). I am also really proud of our work using DNA to identify casualties of the Korean War. Though these soldiers were lost 70 years ago, they have never been forgotten and the team are able to offer much needed closure to their families (p.66).

I am clear that Defence is not complacent and must continue to strive to protect and enhance the environment. So, we can be encouraged by projects such as investigating submarine biofouling (p.22), or our Ice Patrol Ship HMS PROTECTOR supporting research in Antarctica (p.70), or our peat restoration work to improve carbon capture (p.20).

Defence is custodian to important and amazingly diverse heritage, from historic buildings like the Rotunda at Woolwich (p.32) to murals painted by Prisoners of War (p.46). Operation Nightingale continues to combine invaluable archaeological investigations with assisting the recovery of injured, wounded and sick military personnel, and this year they were joined by the Army Widows Association to excavate at Imber (p.58).

Finally, I would like to congratulate the winners of the 33rd annual Sanctuary Awards. It was a great event in Portsmouth, for those present and joining virtually. I am particularly thrilled that Nigel Lewis won the Silver Otter Trophy – it is volunteers like Nigel who encapsulate the collective passion for what we do, that all of us in Defence both share and admire.



Airborne soldiers test their limits in Kenya on Exercise Haraka Storm © Crown

Pioneering sustainability – a glimpse into Head Office’s evolving role

by James Clare

Director Levelling Up, The Union, Climate Change and Sustainability, Ministry of Defence

In the past two editions of *Sanctuary*, readers were introduced to the Climate Change and Sustainability Directorate. This Head Office team has been expanded to include Levelling Up and the Union, and now Environmental Protection – forming the Levelling Up, the Union, Climate Change and Sustainability Directorate (LUCCS). The incorporation of Environmental Protection now means that this central directorate is responsible for all environmental issues and reinforces the close working relationship required with other Head Office areas, as well as with delivery agents (such as the Defence Infrastructure Organisation and Defence Equipment and Support), as well as with the Defence Environmental Protection Regulator. It also means that this central directorate can design the improvements required to mainstream climate and environment considerations into Defence and now embed these directly into the MOD’s evolving Environmental Operating Model.

Over the last year, the LUCCS team has continued to maintain its focus on domestic activity, as well as supporting growing international engagement. The importance of international dialogue in climate and environment is vital. As the UK and our Allies and Partners navigate through the global response to climate change and the energy transition, it will be of increasing importance

to interoperability of our capabilities, as well as ensuring that UK Defence is able to harness the operational advantage that new technology will bring. Domestically, the profile of climate and environment sustainability has continued to be raised through the House of Commons Defence Committee’s inquiry into ‘Defence and Climate Change’, the ongoing success of the Defence Green Network webinars (reaching across the vast expanse of MOD) and the unwavering commitment of volunteers across the forces to take on new sustainability projects.



The House of Commons inquiry provided the opportunity to converge the breadth of work ongoing across Defence and showcase work in Support, across the Defence Estate and with the Front Line Commands and wider Enabling Organisations. Reassuringly, the House of Commons Defence Committee inquiry’s recommendations are broadly aligned with work already underway across Defence and they underscored the need for Defence to adapt and be resilient to the effects of climate change, whilst preserving our capabilities and seeking out opportunities to enhance our operational advantage. The House of Commons Defence Committee also highlighted the security implications of climate change. This theme of activity has been moved further forward with our collaboration with academia, through our support to the University of Oxford and the British Army’s (In)security Project. This collaboration underscores Defence’s commitment to proactive participation in crucial research initiatives and enables access to a broad range of expert advice and first-hand experiences of the impact of climate change. This experience has been harnessed in the development of a Whole Force awareness educational course to highlight the relevance of climate change to all staff.

“
The importance of international dialogue in climate and environment is vital.
 ”

LUCCS is working strategically across the MOD to support the development of Sustainable Support, Operational Energy, and Estate Energy strategies to ensure the maintenance of operational advantage and resilience. These strategies aim to highlight risks, identify opportunities and outline actions necessary for an orderly transition away from fossil fuels. Concurrently, working with the Defence Science and Technology Laboratory and organisations across Defence, LUCCS is working to identify the risks to Defence, our capabilities and estate, as well as wider transitional risks linked to the global energy transition and decarbonisation.

Sustainability: Key achievements in FY22/23

97.20% of Defence Sites of Special Scientific Interest (SSSIs) in England are in **Favourable** or **Recovering condition.**

Defence Information Infrastructure decommissioned **200+ tonnes** of hardware, across **750 sites** with less than **0.02%** of waste going to landfill.

Exceeded Greening Government Commitment target that 25% of the car fleet will be ULEV by 31 December 2022.

Circa 86 contracts awarded where Social Value formed part of the award criteria for competitive procurements.

39.87 thousands of tonnes of waste produced, with **97% diverted from landfill.**

The Defence Carbon Footprint has **reduced from 3.34mt CO₂e** in FY 21/22 to **3.13mt CO₂e** in **FY 22/23.**

Funded/ delivered nature recovery projects across the estate: Almost **£1.5m invested** in over **130 projects** to improve the condition of SSSI.

£1m invested in **biodiversity projects** across the UK and overseas.

Source: MOD Annual Report and Accounts 2022/23

While Defence is clear that we must preserve our capabilities and operational advantage, across the enterprise significant strides are being made to harness new energy sources. Noteworthy achievements include the RAF's synthetic fuel flight, a Voyager aircraft flying on 100% sustainable aviation fuel (see p.8) and the Army's investments in battlefield electrification (*Sanctuary 51*, 2022). While the Royal Navy, having introduced River Class Offshore Patrol Vessels fitted with catalytic reduction that can reduce emissions of nitrous oxide by up to 97% (*Sanctuary 50*, 2021), is now exploring hull designs and coatings to reduce energy demands during operations.

Running through all of this work is climate and environment risk. Over the last year and with colleagues across Defence, a Defence Climate Risk Assessment Methodology has been rolled out building on previous climate resilience work. This work will ensure that across Defence there is a consistent approach to identifying, assessing

and managing climate related risks. It will also ensure that Defence is well placed to meet the requirements for the new central government accounting reporting standards linked to the Task Force of Climate related Financial Disclosures. LUCCS have also sought to ensure that the MOD is collaboratively working with industrial partners and through the Defence Suppliers Forum have established a linked Code of Practice to improve the consistency of our reporting.

As the team reflects on a busy year, set against the requirement from 1 November 2023 that Defence will need to have due regard to the Five Principles of the Environment Act, the individual efforts, showcased brilliantly throughout the articles in this edition of *Sanctuary*, underscore the importance of collective action. Through all of our action we can ensure that Defence is not only improving its environmental management, but also ensures that we are resilient to the impact of climate change.



HMS TAMAR conducting exercises while a local population of common dolphins investigates © Crown

Around the Services Royal Navy

by RAdm Paul Beattie

Director Naval Staff, RN 2*

CC&S Champion, Royal Navy

2023 has been a year of activity for Royal Navy Climate Change and Sustainability (CC&S). The nine Lines of Development of the Royal Navy CC&S Phase 1 Plan (to 2025) have been progressing at pace and the Royal Navy is ahead of schedule to complete Phase 1.

The Royal Navy CC&S team has grown, gaining Logistics Support, Portfolio Manager and Data Lead roles. These appointments will help drive the future RN CC&S Plan development and maintain governance within the programme. The Data Lead role will play a critical part in developing our data collection and analysis processes to inform future direction and improve data integrity.

Over the last year, the Royal Navy CC&S team has worked closely with the Royal Navy Personnel Support Group, resulting in several secondments into the team of personnel supporting on activities such as creating and updating the CC&S section of MyNavy, reading across relevant initiatives from the Greener NHS and more recently working with the Royal Navy Infra team.

This year has seen the successful development and implementation of a sustainability assessment tool for use by Fleet Operational Standards and Training (FOST) in assessing the award of the new FOST Sustainability Flag: recognising our deployed force efforts in sustainability.

Understanding our risks associated to climate change is important to the Royal Navy. A good deal of work has been done this year in identifying our climate risks, prioritising them, embedding into our standard risk management processes and undertaking scenario analysis against our top risks to understand how they could impact our operations in a climate changed world.

Across our estates, net zero annexes have been developed in all Estate Management Plans, with delivery plans developing to support these. Greening Government Commitment targets have been disaggregated to site level, with an award scheme initiated to support this drive.

Work is underway to develop a shipboard demonstration of a sustainable fuel, and further studies have been commissioned to better understand our future options in the maritime energy transition. We have also been working closely with our commercial maritime counterparts in this field.

The first draft of the Royal Navy CC&S Phase 2 Plan has been produced: defining our emission reduction and adaptation roadmap and delivery plan to 2035, across estates, operational capability and our value chain.

Having built a strong foundation in Phase 1, and embedding sustainability throughout the Command, we look forward to implementing Phase 2; building resilience to climate risks and exploiting opportunities to reap the operational benefits of a more sustainable Navy.

HMS Protector, the Royal Navy's only Ice Breaking Patrol Ship, alongside King Edward Point in South Georgia © Crown



Around the Services British Army

by **Maj Gen Richard Clements**

Director, Basing and Infrastructure and Army Sustainability Champion, British Army

The Army is addressing the challenge of operating more sustainably through energy resilience, estate management and behavioural change.

In support of the Defence Operational Energy Strategy, the Army has invested circa £14 million in Battlefield Electrification (£13 million more is programmed), to inform hybrid electric requirements for future capabilities. Technology driven transformation is focusing on MAN SV truck, Foxhound and Jackal reconnaissance platform; MAN SV has progressed to refining the platform prior to conducting robust trials.

Research and development of smart microgrids and advanced energy storage continue to shape thinking around operational energy, with these technologies on a mature pathway to exploitation. Energy resilience is further supported by Project Prometheus, with two more solar farms delivered in 2023, enroute to circa 75 sites (see p.62). Typically, these installations meet one third of a host site's electricity needs.

The Army's physical spaces are being transformed into smart environments. Through the Army's Digitalisation Programme, THEIA, engagement with Cisco and BT is leveraging Wi-Fi and Bluetooth data to track movement and behaviour of people and assets. Trials are underway at Andover, Larkhill and London.

Similar innovation is being exploited through the Army's accommodation programmes. At Imjin Barracks, new accommodation is equipped with smart technology to measure occupants' energy usage and support increased efficiency. In addition, 112 new bedspaces have been delivered at the Defence School of Transport with rooftop solar, air source heat pumps and heat recovery systems; over 20% of training estate accommodation is now net zero.

Behavioural change is pivotal to the Army's sustainability ambitions. Over the financial year 2022 – 2023, a competition to encourage personnel to reduce energy consumption saved circa £3.7 million on utility bills and reduced CO₂ emissions by 11,000 tonnes across the estate (see p.82). Headquarters Home Command have also successfully launched their campaign to increase the pace of climate change and sustainability behavioural change, covering waste reduction, travel efficiencies and energy saving in a concerted green push.

Finally, in May 2023 the Army fulfilled a leading role in the King's Coronation with sustainability as a key theme of the event. The Army reduced environmental impact by transporting personnel by train, saving more than eight tonnes of CO₂ emissions. Working with delivery partners at the Defence Infrastructure Organisation, 15,000 lunches for soldiers and staff were packed in recyclable materials. Personnel were also encouraged to bring reusable water bottles, reducing single-use plastics and waste to landfill.

As you can see, the Army has been busy, and is gaining even more momentum.

The Army took steps to reduce environmental impact during its participation in the King's Coronation © Crown



Around the Services Royal Air Force

by **AVM Shaun Harris**

Director Support, Royal Air Force

The RAF continues in its quest to become the first air force in the world to be net zero by 2040.

Last November, a test flight took place on a Voyager aircraft using 100% Sustainable Aviation Fuel, the first time any military in-service wide bodied aircraft had flown on 100% Sustainable Aviation Fuel. With all aviation platforms currently certified to fly using a maximum 50/50% Sustainable Aviation Fuel/jet fuel blend, this was followed by two air-to-air refuelling sorties on blends of between 40% and 48%. These flights showcased forward thinking and innovation by the RAF and industry in preparing for operations beyond fossil fuels and demonstrated one of the solutions available to reduce military aviation emissions.

The evidence-based data gathered from these flights helped to shape one element of the Defence Aviation Net Zero Strategy which the RAF published, together with industry support

and Ministerial backing, in July 2023. The strategy outlines a clear argument for why climate change and sustainability considerations are important to the Defence Aviation Sector's role in national security, whilst also outlining the five pillars that will make its climate goals possible, including Rethinking Capability Provision, Efficiency Improvements, Sustainable Aviation Fuels, Zero Emission Propulsion and Carbon Removals. Net zero aviation research and development continues via Projects MARTIN, VERMEER (synthetic fuel) and MONET (low emission aircraft).

The built estate may generate significantly less emissions, but the RAF is none the less proactively addressing decarbonisation. With a heightened focus on energy resilience and security, surveys and trials relating to renewable energy options including solar, geothermal, biogas and wind are underway with a view to delivering the resulting solutions over the coming years. This will provide the RAF with the resilience it requires to ensure operational output is not affected by unplanned disruption.

Similarly, ground transport is transitioning with not only the continued roll out of electric cars but also an exciting trial of a converted diesel medium aircraft tow tug to operate on hydrogen. Further hydrogen and dual fuel/hybrid vehicle trials are planned over the coming years which will assess alternatively powered vehicles' functionality and appropriateness for home and deployed use.

Finally, responsible protection and exploitation of the natural capital which makes up a significant proportion of the RAF estate has seen some laudable local initiatives. During 2022 to 2023, many parties were very busy creating wildflower meadows, planting trees, supporting conservation and increasing the environmental health and carbon sequestration of the RAF estate.

100% Sustainable Aviation Fuel Voyager flight © Crown



A RAF Voyager aircraft sits in the harsh winter weather at Mount Pleasant Complex, Falkland Islands while personnel clear snow © Crown

A climate change and sustainability update from UK Strategic Command

by Maj Gen James Roddis

UKStratCom Director Strategy, UKStratCom

In an increasingly unstable world, UK Strategic Command (UKStratCom) recognises the threats and opportunities that climate change and sustainability (CC&S) can have on our capabilities, our people and our overall resilience.

As a Command we have redefined our core purpose providing support to campaigning, leading the cyber and electromagnetic domain, and driving integration. We have identified that CC&S considerations are key to the successful modernisation and transformation of each of these, from understanding supply chain, energy and water resilience on bases and operations, to ensuring our license to operate is not compromised.

A huge task lies ahead requiring coordination, integration and investment. We have introduced firstly, a £1 million local initiative fund for CC&S which this year has seen an orchard planted at Corsham and biodiversity improvements at Shrivenham and DMS Whittington. Secondly, a significant financial commitment to supporting sustainable innovation for operational and strategic advantage. This means supporting our High Level Budget holders to move at pace to trial and implement initiatives that enhance our capability, whilst mitigating our CC&S risks.

A snapshot of where UKStratCom is driving improvements:

Defence Support – Collaborating on the successful implementation of the six initiatives within the Sustainable Support Strategy, in particular self-sustainment on operations, we are seeking to enable faster implementation through innovation funding. The global economy is now

on a transition to low or non-carbon fuels and the Defence Support Operation Energy Strategy ensures we remain resilient and effective.

Defence Digital – Implementing the Sustainable Digital Technology and Services plan to reduce environmental footprint, support digital adaptation and evolution, and embed responsible procurement across UKStratCom. Digital solutions can play a huge role in ensuring climatic risks of the present and future are understood and mitigated effectively and efficiently.

Directorate Overseas Bases – Strategic locations for the UK armed forces, many of which are hotbeds for geopolitical and climate events and supply chain/resource insecurity. We work collaboratively to identify opportunities with host nations, the Foreign, Commonwealth and Development Office and Defence Infrastructure Organisation on energy resilience and security across all our bases. There are projects underway in Ascension Islands, Falkland Islands and Cyprus, where large-scale solar photovoltaic investment will bring our total capacity to over 1.5MW next year.

Defence Intelligence – Developing tools to improve our climate detection and preparedness in collaboration with the Defence Science and Technology Laboratory, especially vulnerabilities at our overseas bases.

Joint Force Development – Continuing to develop new, and adapt existing, training to embed CC&S and leading integration of climate and energy security into wargaming scenarios.

Research shows jaguars are breeding successfully within the areas used for jungle training in Belize © Panthera

A climate change and sustainability update from the DIO

by **Andrea Nixon**

Head of Capability, Defence Infrastructure Organisation

As the world, and thus Defence, continues to face the challenges presented by climate change, it is increasingly apparent that sustainability must be at the heart of all that the Defence Infrastructure Organisation (DIO) delivers. The DIO's Head of Capability has a responsibility to develop and deliver the strategy that will tackle these sustainability challenges. Following an exceptionally busy 12 months, the focus going forward is to continue to break down the barriers that Defence faces in embedding sustainable thinking and behaviours into our daily delivery. At the heart of that is ensuring that we make better use of data and data analytics to support sustainability activity, as well as continuing to support work across our overseas estate.

With a move to embedding sustainability into the everyday comes the need to change business practices and ways of working, as well as continually developing and delivering new tools and methods of data collection. The roll out of the Climate Impacts Risk Assessment Methodology across Defence is enabling the collation of invaluable data to evidence our future sustainability strategies and planning, whilst the completion of the major Natural Hazards assessment for the estate has facilitated the methodical assessment of current and future risks to Defence output from the

natural environment and climate change. Equally, by simplifying processes we can ensure that incorporating sustainability into work is not seen as a blocker to progress; the new Sustainability Assessment Workbook is considerably easier to navigate, providing an audit trail through a project lifetime.

To support this need for greater data and analysis, the DIO has developed a Sustainability Scrutiny database which can track scrutiny actions and analyse trends during major defence development approval processes – a fundamental part of reporting requirements. The database also supports closer collaboration across Defence and our partners, speeding up and improving approvals across the business, all while ensuring that sustainability remains a key consideration in all major developments.

Whilst these tools are fundamental to supporting the incorporation of sustainability into the DIO's routine work, without appropriate training they will quickly become redundant. We have therefore created and launched a series of online sustainability and environment training modules, which focus on the MOD Sustainability and Environmental Appraisal Tools and provide advice from DIO subject matter experts across

the sustainability spectrum. Additionally, we have engaged KPMG to lead on the Defence Approach to Sustainable Infrastructure through several innovative, deep dive workshops. Working with DIO subject matter experts and representatives from across Defence and our industry partners and using the Defence Approach to Sustainable Infrastructure outcomes and learning, we will deliver a series of recommendations to prioritise actions going forward.

As well as improving data and data analytics, we will also continue to move to a more sustainable mindset. The MOD estate has a unique set of challenges that must balance operational military requirements alongside an area highly valued and designated for its environmental qualities. The Environment Act 2021 introduced new obligations for nature recovery in England, including delivering Biodiversity Net Gain for new infrastructure projects that require planning consent. The DIO has seized the opportunity, as part of the MOD's Nature Recovery Plan, to create new areas of valuable wildlife habitat for pollinators and support isolated populations of scarce species. As part of this ambitious programme of work we are restoring peatland, have created a pioneering



New wetland created at Sennelager to support wildlife © Richard Snow

Panthera brief troops on the wildlife they will encounter while undertaking jungle training in Belize © Maj D Davies



wetland to reduce phosphorous levels in the River Avon on Salisbury Plain Training Area, and continue investment in our 82,000ha of Sites of Special Scientific Interest.

Away from the UK, our Overseas Stewardship Fund has targeted five countries to further our understanding of the overseas MOD estate, enhance its condition and support key partnerships. We have seen major improvements in the quality of designated environmental sites in Cyprus, purchased lab equipment to support entomological research into disease vectors and pollinators, planted new native woodlands, created wetlands in Germany, purchased cameras to support jungle wildlife research in Belize and created a new wellbeing and wildlife community garden in Brunei. Additionally, the team has been central to the co-ordination, development and mobilisation of health and safety, environment, sustainability and engineering standards and performance for the new Future Defence Infrastructure Services and Overseas Procurement Contracts.

As government and Defence climate change and sustainability policy continues to change and mature, it is evident that the DIO needs to be ready to respond. Using the significant progress made over the last few years in placing sustainability at the heart of DIO output, we must continue to build on this momentum, set realistic but ambitious goals and be unafraid to question processes that do not support a sustainable mindset. We are fully committed to this and look forward to delivering key programmes of work including electrical vehicle charging infrastructure and future energy provision, seeking out opportunities for energy generation and storage.

Sanctuary Awards 2023

Celebrating sustainability across the MOD

The Sanctuary Awards board for 2023 comprised of:

Defence Infrastructure Organisation (DIO)

Richard Brooks (Chairperson)

Principal Environmental Manager
DIO Environmental Management, Protection and Sustainability

Alan Mayes

Corporate Plans Head
DIO Strategy and Plans

Security, Policy and Operations (SPO)

Ray Dickinson

Assistant Head of Policy
SPO Climate Change and Sustainability

Defence Equipment and Support (DE&S)

Owain Redfern

Environmental Policy Manager
DE&S Environmental Protection and Sustainable Acquisition

External judges

Martin Baxter

Deputy CEO
Institute of Environmental Management and Assessment

Julia Powell

Sustainability Lead, Synergy Programme
Department for Work and Pensions

The Editors would like to say a particular thank you to Alan Mayes and Julia Powell, who are stepping down from the judging panel after many years of service. We send them our best wishes for the future.

The Sanctuary Awards have been recognising outstanding sustainability and conservation efforts across the MOD since 1991.

In 2023, entries were sought for the following categories:

- **Environmental Enhancement Award**
Projects focused on wildlife and biodiversity, environmental research, or tackling pollution and contamination issues.
- **Heritage Award**
Projects focused on archaeology, historic buildings, historic parks and gardens, historic landscape preservation, museum collections, heritage education and public engagement.



The Sustainable Business Award © Guy Salkeld

- Individual Achievement Award**
For those who have made a significant personal contribution to MOD sustainability or conservation as a volunteer, MOD employee or contractor.
- Sustainable Procurement and Construction Award**
Projects to improve sustainability of equipment or services, management of supply chains or product life cycles or new build construction and refurbishment projects that innovate in fields such as new materials or design.
- Social Value Award**
Projects focused on any of the social aspects of sustainability, including heritage, public access, community engagement and education.
- Net Zero and Resource Efficiency Award**
Projects that contribute to the MOD's net zero ambition, reduce energy, water or resource consumption, renewable energy or recycling.



Winners from each of the categories were further considered for one of the following overall awards:

The **Sustainable Business Award** is given to the best larger scale or commercial project, which delivers sustainable solutions to enable the armed forces to live, work or train. The trophy incorporates the three elements of sustainability: social, environmental and economy, together with military operations, by setting three spent 30mm percussion caps into a glass panel. This stands within a brick salvaged from Scraesdon Fort in Cornwall, representing sustainability in our buildings and infrastructure. By 2022, the trophy needed extra engraving space. The Keep in neighbouring Tregantle Fort was undergoing conservation works and a small section of salvaged oak floorboard was provided to make a bespoke base.

The **Silver Otter Trophy** is awarded to the best Conservation Group, establishment, community led project or individual conservation effort on the MOD estate. This prestigious trophy has been awarded annually since it was donated by the Commandant of Otterburn Training Area in 1991, which marked the start of the Sanctuary Awards.

All long listed entrants were also considered for the Innovation Award, which was judged separately by subject matter experts from the

Defence Innovation Directorate, part of Military Capability within Head Office. The award is given to the project or individual most deemed to have exemplified innovative behaviours by championing the adoption of new ideas, innovative ways of working and continuous improvement. This includes taking appropriate risk or early termination of work where relevant.

The Sanctuary Awards 2023 ceremony was held as a hybrid event in Portsmouth on 19 March 2024, and is available to watch on the MOD's YouTube channel. The results can be seen in the table on the next page.



The Silver Otter Trophy © Guy Salkeld

Award	Project name	Full story on page...
Environmental Enhancement Winner	The Submarine Biofouling Project	22
Environmental Enhancement 2nd Place	The Army Solar Biodiversity Network	56
Heritage Winner	Conservation of Prisoners of War Mural Artwork at Sennybridge Camp	46
Heritage 2nd Place	Scampton Community and RAF War Graves Heritage Centre	68
Individual Achievement Winner	Maj (Ret'd) Nigel Lewis	15
Individual Achievement 2nd Place	Harvey Mills	34
Sustainable Procurement and Construction Winner	The Joint Band School Project at HMS Nelson	78
Sustainable Procurement and Construction 2nd Place	Demolition of the Redundant Liquid Waste Treatment Plant at AWE Aldermaston	53
Social Value Winner	Closing the gap – Babcock Production Support Operative Programme	74
Social Value Joint 2nd Place	Royal Navy Royal Marines Charity Canvas Works Upcycling Project	63
Social Value Joint 2nd Place	Clyde Commercial Framework	40
Net Zero and Resource Efficiency Winner	Army Energy Efficiency Incentivisation Award Scheme	82
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Net Zero and Resource Efficiency Joint 2nd Place	Climate Change and Defence Resilience Awareness Course	30
Innovation Award Winner	Scampton Community and RAF War Graves Heritage Centre	68
Sustainable Business Award Winner	Army Energy Efficiency Incentivisation Award Scheme	82
Silver Otter Trophy Winner	Maj (Ret'd) Nigel Lewis	15



Celebrating 40 years of the MOD Owl and Raptor Group on Salisbury Plain Training Area

by Lt Col (Ret'd) Richard Clayton
Secretary & Treasurer, MOD Owl and Raptor Group

The MOD Owl and Raptor project on the Salisbury Plain Training Area is celebrating its 40th anniversary. When Maj (Ret'd) Nigel Lewis was posted to the staff at Warminster in 1983, he initiated the Owl and Raptor project to erect nest boxes for birds of prey. Under Nigel's inspired leadership, the project has continued to monitor, ring and collect valuable data on the owl and kestrel population. Nigel is supported by a small team of enthusiastic volunteers who turn out on Saturdays throughout the year.

The project monitors tawny owls, barn owls, little owls and kestrels. The breeding success of these species varies significantly from year to year as it depends on their ability to feed in bad weather and also on their principal food supply, the short-tailed vole, the population of which fluctuates significantly.

In the natural environment, owls prefer to nest in cavities. As much of the training area is open chalk

grassland with few buildings or tree cavities, nest boxes enable owls and kestrels to realise their full potential. Over the years, Nigel has erected a total of 336 owl and kestrel nest boxes on the Plain. Kestrels prefer an open fronted box so that they can watch the world go by, barn owls and little owls prefer a closed box, while tawny owls are happy in a chimney design open to the rain.



Over the years, Nigel has erected a total of 336 owl and kestrel nest boxes on the Plain.



Nigel Lewis ringing a kestrel chick © Richard Clayton



Unfortunately, Nigel's nest boxes are also attractive to other species. Squirrels make drays in boxes and gnaw extra exit holes. Jackdaws fill nest boxes with sticks preventing owls from breeding, on occasion they have even buried sitting owls. Nigel has added an internal corridor with sharp bends to control the length of stick that can be imported with limited success. This problem is, unfortunately, getting worse.

The team travels round the Plain in its own Toyota pickup, carrying ladders and other equipment. In the spring, the team visits nest boxes to check when eggs are laid, giving a timescale for ringing chicks later. A team member quietly erects a ladder, climbs to each nest box and inserts a cloth bung in the entrance hole to trap the owls. A door on the side is then opened and a hand inserted to gently grasp each chick or adult so that they can be ringed and wing length, weight, sex and state of moult can be recorded.

Owls produce pellets containing unwanted fur and bones from their prey, as well as defecating inside nest boxes, which combine to create a strong ammonia smell. Smelly deposits have to be cleared out with a scraper and some good thick gloves.

Nest boxes have a life of only a few years in the open. Supporting trees can blow down or suffer from disease such as ash dieback. In the autumn, the team repairs and replaces nest boxes. Unused boxes are moved to more suitable sites and new boxes erected. Nest boxes are either made by team members or professionally by the Hawk and Owl Trust when conservation grants are available. The team has benefited from generous grants towards nest box construction and other costs from the Defence Infrastructure Organisation's Conservation Group Grant and other sources.

The MOD Owl and Raptor project would not have been possible without the support, advice and assistance of Salisbury Plain Training Area's Range Operations. Access is only permitted when it does not conflict with military training and entry to the live firing areas is obviously tightly controlled. Changes to safe access boundaries occur from time to time and some of the nest boxes to which access was originally permitted are now out of bounds. Fortunately, owls are no respecters of MOD boundary lines and continue to use these boxes.

Overall, the MOD Owl and Raptor project has been very successful. The additional nesting sites in boxes has caused an increase in the tawny and barn owl and kestrel populations across the Plain, but sadly little owls are a declining species as they are day flying and easily predated. In the last 40 years, several thousand owl and kestrel chicks have been ringed on the training area. All the data collected is reported to the British Trust for Ornithology, the Swindon and Wiltshire Biological Records Centre and to the MOD.

The success of the team's efforts was acknowledged with the Silver Otter Trophy in the Sanctuary Awards 2014. This year Nigel has been awarded both the Individual Achievement Award and the Silver Otter Trophy, recognising his outstanding contribution over 40 years.



Kestrel and nest box © Mark Fisher



Nigel Lewis with seven ringed barn owl chicks © Richard Clayton



3D model of Pricaston Farm generated from the laser scan survey © Russell Geomatics Ltd

The conservation of Pricaston Farmhouse

by **Kathryn Sayner and Robin Badham**
Historic Buildings Advisor and Project Manager,
Defence Infrastructure Organisation and Landmarc

Situated on Castlemartin Range in Wales are the sprawling and evocative ruins of Pricaston Farm – a scheduled monument and a Grade II* listed building. The ruins are located on a rugged and open landscape on the south Pembrokeshire coastline; a landscape historically used for arable farming. The standing remains provide a strong visual and tangible link to the past farming settlement at Castlemartin.

The large, aesthetically pleasing 18th century farmhouse illustrates a rich tapestry of interventions, having undergone extensive remodelling throughout its history. Its special interest derives from its origins as a medieval cross-passage hall house.

The condition of the ruins, highly exposed to weathering and the marine environment, required intervention to protect significant and interesting components of the medieval house. Elements such as the vaulted service rooms were thought to be at risk from potential collapse of the masonry structures above.

As active custodians of the historic ruins, the Defence Infrastructure Organisation (DIO) and the industry partner, Landmarc Support Services (Landmarc) worked together to develop a management approach to protect the heritage asset. This collaboration kick started a rolling programme of conservation projects funded by the DIO Conservation Stewardship Fund undertaken between 2020 – 2022.

The initial Conservation Stewardship Fund project involved recording and surveying the farmhouse remains. Russell Geomatics undertook a laser scan and drone survey as part of the structural survey completed by a team of conservation accredited engineers from Mann Williams. This identified a set of priority work required to stabilise and consolidate the ruins.

The laser scan provided detailed photogrammetry elevations, plans and 3D imagery to identify and inform locations requiring structural intervention. The images captured the texture and imperfections in the masonry and were effective in informing the

application submitted to the statutory body, Cadw, for Scheduled Monument Clearance.

The application process involved discussions between the project team and Cadw regarding the most sympathetic and appropriate methods of intervention. Traditional materials and methods were specified and, in some areas, due to the structural condition, a more modern and intrusive solution was required to ensure key features were protected.

After exploring the different options, Cadw approved a schedule of works including vegetation removal, localised lime mortar repairs, repointing and capping, replacement timber lintels and pinning over hanging stonework. The work also included the careful and highly technical installation of reinforcing Cintec Anchors to secure a leaning section of walling.

The projects were managed against challenging timeframes and budgets which included unexpected cost implications. The training area is extremely busy, and the on-site work was limited to the four-week shutdown period available each August.

These complex logistics required the scope of work be carefully considered and phased. In the first year, localised stabilisation works, including repointing using lime mortar, were undertaken. A historic building recording and archaeological watching brief were completed by Black Mountains Archaeology. Historic timbers were recorded and dated using dendrochronology (which studies data from tree ring growth) and preparatory design work was produced to secure the following year's funding bid.

The next phase of work involved more substantial structural reinforcement work. This began with a bespoke scaffolding system which required a self-supporting and independent design to avoid damage to the historic fabric. In addition, other factors to be considered were intricate design and construction details, the various phases of past extensions to the structure and the rustic finishes to the walls which are all out of plumb.

This sound understanding then allowed the specialist sub-contractor, Falcon Structural Repairs Ltd, to carry out the technical installation of Cintec wall anchors. The anchors, in some places over 7.5m deep, involved core drilling with pinpoint accuracy through a solid stone wall with a

noticeable lean over the medieval section of the monument. The intricacy of this work was further complicated by the presence of various chimney flues and alcoves along the wall.

The tall section of wall was carefully stitched with several anchors, running both vertically and horizontally. As a result of this work, the reinforcement anchors have secured the structural integrity wall and the medieval features below. This was a particular success given the accuracy required and the value of securing the stonework which displays scars of past interventions and enriches the instructive nature of the ruins.

The conservation work at Pricaston Farmhouse had various complexities and felt like a military operation to mobilise, complete the works and clear the site ready for the resumption of training. This required a huge effort from all involved and a cohesive project team to dynamically resolve various issues which occurred throughout the work. Whilst challenging, the projects overall were hugely satisfying and rewarding and have been met with positive feedback.

The culmination of almost three years work between DIO, Landmarc, Cadw and a host of approved consultants and contractors has ensured the protection of these highly valuable historic ruins.



The medieval cross-passage
© Black Mountains Archaeology Ltd

The power of peat

by **Moira Owen**

Senior Ecologist,
Defence Infrastructure Organisation

One of the first things that comes to mind when thinking about combating climate change and the biodiversity crisis are trees. The focus is so often on tree planting to save the planet, it really does get good press. What is mentioned less often is the importance of peat.

Peat is decomposed organic matter derived from plant material, which has accumulated under waterlogged conditions. The key peat forming plants are bog-mosses *Sphagnum spp.* There are a variety of associated specialist plants including the insectivorous sundews and tussocks of cotton-grasses, heaths and purple moor-grass that provide the structural component of bogs.

Peatlands only cover 3% of the world's surface, but they hold 30% of the world's soil carbon. Although they cover a much smaller area, they store more than twice the carbon stored in the



Sphagnum mosses form peatland © Crown

world's forests. Peatlands have a role in reducing global warming, but they are also important for biodiversity. They are rare habitats that develop in the cool wet conditions needed for peat to form. It should therefore not be a surprise that in the European context the most important peatlands are in north-western Britain and Ireland.

There are a variety of peatland habitats. Blanket bogs form the extensive covering of peat at altitude in the British uplands, with peat depth being around 30 – 50cm. Shallower peat underlies wet heathland; and deep peat, often several metres thick, occurs in raised mires in the uplands and lowlands. Peat is also formed in other wetland habitats such as fens.

As well as carbon storage and biodiversity, peatlands are important for the water environment, storing water and reducing flooding risk downstream. On the MOD estate, they contribute to the diversity of the training environment. The extensive open landscapes of peatlands are important as range danger and impact areas.



Upland blanket bog in good condition © Crown

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Peatlands only cover 3% of the world's surface, but they hold 30% of the world's soil carbon.

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Peatland has to be in good condition to provide carbon services, support wildlife and retain water, and unfortunately it is estimated that only 13% of England's deep peat is in a natural state. Peat has, and still is, being damaged by draining, burning, overgrazing, afforestation, and air pollution, such that carbon dioxide is being released rather than stored, contributing to global warming. The imperative is to restore peatlands to reduce emissions, as well as enhancing the provision of ecosystem services such as carbon sequestration and water storage.

Management of the MOD estate has involved a variety of peatland restoration projects over the years; some funded by the Defence Infrastructure Organisation's (DIO's) Conservation Stewardship Fund, others carried out in partnership with organisations such as the North Pennines National Landscape (formerly called Areas of Outstanding Natural Beauty) and the Border Mires Committee. It is now time to upscale activity. Throughout 2023 and into 2024 a Peatland Restoration Plan is being developed. The intention is to carry out landscape-scale peat restoration over the long term, with the estate providing a variety of public services and environmental benefits in conjunction with enabling military training and other Defence needs.

The steering group for the Peatland Restoration Plan has a wide membership including from Army Basing and Infrastructure, Defence Training Estate, MOD Head Office, and various parts of the DIO, to name a few. The objectives of the plan are firstly to improve data. In common with the rest of the UK, information on the distribution, depth,



Peatland in need of restoration with grip starting to erode © Crown

and condition of the peat on the MOD estate is not accurate. Work will continue improving the condition of designated peatlands. A restoration programme for high-quality peatlands consisting of habitats of principal importance will contribute to statutory nature recovery targets. The restoration programme will reduce carbon emissions and contribute to achieving carbon net zero and restoration of hydrological integrity will reduce flood risk and improve water quality.

The largest extents of peatland are at Otterburn, Warcop, RAF Spadeadam, Cape Wrath and Garelochhead. There are a variety of methods used to restore peatland, depending on the local conditions and the degree of damage to the peat. Some can be small scale such as the removal of tree saplings or involve the use of excavators appropriate for use in the upland environment such as low ground-pressure tracked vehicles. The blocking of manmade ditches, originally installed to drain ground for agriculture or forestry, is the most common activity. Ditches (also known as grips in moorland settings) can be blocked with peat if there is sufficient quantity and quality, or artificial dams of wood, coir, stone or plastic piling can be installed. Where erosion is occurring gullies and peat hags may be reprofiled.

Future challenges will involve obtaining sufficient resources to carry out works at scale. An opportunity will be recognition of the economic benefits to undertaking peat restoration, which can be very costly, taking a natural capital approach with use of the Peatland Code. This will be a long-term effort which we cannot afford not to do.

A fouled settlement panel © Submarine Delivery Agency



The Biofouling Project – improving biosecurity of Royal Navy submarines



by **Alexandra Wright**

Marine Biologist and Graduate Engineer, Ministry of Defence

Biofouling is the accumulation of marine organisms on submerged surfaces, hulls and ballast tanks of merchant or naval vessels. Fouled vessels can act as a vector for the transport of non-native species to UK waters, potentially introducing invasive species to coastal ecosystems and threatening native biodiversity.

The Royal Navy employ technical and strategic solutions to minimise biofouling and the transport of marine organisms to UK waters, helping to manage our biosecurity and protect our shores. Due to the profile of Royal Navy submarines, traditional methods used on surface ships to control biofouling cannot always be applied.

HMNB Clyde, in picturesque rural Scotland, is the operating base for Royal Navy submarines and the focus of 'The Biofouling Project'. Located near marine conservation areas, protecting the local ecosystem, fisheries and economy requires the MOD to develop novel, innovative approaches.

The project's objective is to survey the biofouling present on submarines to understand the potential risk of introducing invasive non-native species from boats returning from patrol. This will enable the MOD to design tailored mitigation measures and controls to reduce this risk as far as reasonably practicable. Led by the Submarine Delivery Agency, working closely with the Royal Navy, the project has involved collaboration from across Defence, with the marine ecology expertise provided by Plymouth Marine Laboratory Applications Ltd (PML).

Following the pilot survey in 2021 (see *Sanctuary 50*, 2021), the methodology has been adapted, becoming more dynamic and capturing data from the hulls, as well as within seawater tanks by developing several complimentary approaches. The first and original survey method involves the team inspecting ballast tanks and free flood spaces while the submarine is out of water for maintenance. Species are collected and their location, abundance and size ranges recorded. Some are identified in

situ, while others are preserved and taken back to PML's laboratories for microscopic analyses or genetic testing.

The second method utilises a combination of Remotely Operated Vehicles and specialist divers. The Remotely Operated Vehicles sweep the hull while the footage is monitored by ecologists. Divers are then directed to areas of interest or heavier fouling for closer inspection and to sample organisms; these are analysed in a similar way to samples collected during tank surveys. If either the technology or divers are unavailable, data can still be collected using just the Remotely Operated Vehicles or divers in isolation.

In addition to the submarine surveys, the team installed Biosecurity Panels at HMNB Clyde. Panels are a simple construct incorporating five discrete surfaces with different orientations providing areas for settlement and inspection. They are weighted, placed in the water next to berths, and the distribution and abundance of marine organisms growing on the panels are recorded. Studying the marine organisms growing on the panels builds a picture of the biodiversity and seasonal trends at Gare Loch and can help identify the areas on submarines most susceptible to biofouling pressures.

The project has conducted numerous submarine surveys at HMNB Devonport and HMNB Clyde. Additional biosecurity panel checks have confirmed the baseline species for HMNB Clyde which can be used as a reference for the boat surveys. Analysis of all the data is currently ongoing; the results will inform biosecurity arrangements and monitoring regimes for the Submarine Delivery Agency at Naval Bases supporting submarine operations.

Lessons from the surveys conducted to date will inform future techniques and enable data targeting, capturing intelligence to enable operators to cross reference operating profiles with the associated risk of invasive non-native species so appropriate mitigations can be employed.

Biosecurity panels will be regularly monitored for changes to the baseline species, identifying potential introduction events and becoming an early warning system for non-native or invasive species. Panels will also be placed at HMNB Devonport to begin gathering baseline data.

Benefits of this project go beyond the obvious scientific and policy provision. MOD staff and

trainees have had the opportunity to participate in data collection and experience practical conservation work. It has brought the Submarine Delivery Agency team closer to both Naval Bases and environmental professionals within industry partner organisations, fostering communication across the MOD and wider.

Settlement panels can provide an opportunity to explore biofouling prevention technologies by furthering our understanding of how fouling reacts to surfaces and the subsequent impact on materials. There are opportunities to share findings throughout Defence to improve technical solutions and engineering performance.

The Submarine Delivery Agency is continuing to enhance the project and develop its people by bringing more elements of the research and reporting in house. Several surveys have now been conducted by MOD personnel using knowledge gained from external sources.

As the Biofouling Project becomes an enduring programme of work, the Submarine Delivery Agency will continue to inform the MOD's response to biofouling and biosecurity, supporting conservation efforts in protecting the UK coast. This hands-on, research driven approach to biosecurity management of Royal Navy submarines has only been possible through the dedication and passion of all those involved.



The team checking rope which supported a panel © Submarine Delivery Agency

The rise and fall of Genista I at Buffadero Training Centre

by **Guy Salkeld**
Archaeologist, Defence Infrastructure Organisation

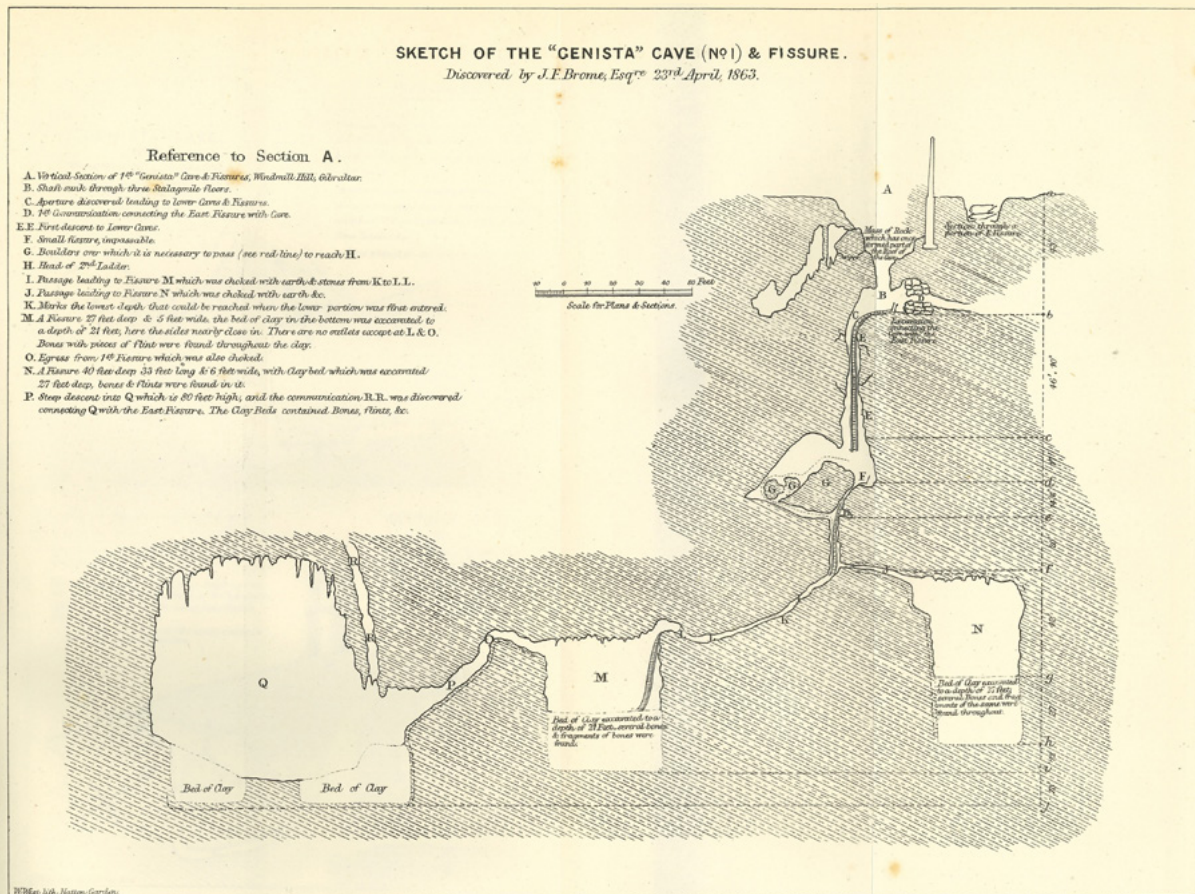
During August 2020, groundworkers at Buffadero Training Centre, Gibraltar, moved an inscribed stone which commemorated the discovery of the lost Genista I cave system 'nearby' in 1863. Unexpectedly, the stone had been hiding steps running down into the ground below the Centre. The stone was clearly not in its original position and research was needed to establish the significance of the steps and suggest a new location for the inscribed stone.

Genista I

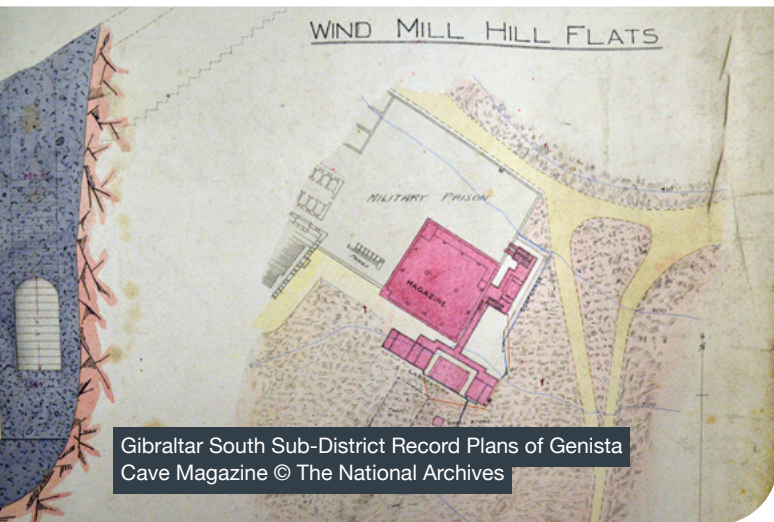
Buffadero Training Centre was built on the site of the old military prison which was demolished in 1969. In 1862, the prison yard was enlarged by a high wall enclosing a considerable space to the east, and an excavation commenced for a water tank close to the south-east corner. Capt Frederick Brome, the Prison Governor, reported that: "The

space marked out for the tank, under which Genista I was discovered, was in the angle formed by the excavation for the south and east boundary walls; its dimensions were to be sixty feet by fifty feet, and fourteen feet deep".

On 23 April 1863, whilst excavating for the foundation of the south wall, the prisoners came upon a rock covered with stalactites. A boar's tusk with sherds of pottery and shells were found nearby. Brome described how the cave ran in a zigzag form along the whole excavation for the tank into an oblique passage on the north side; this passage, nine feet high and four feet wide, was connected with the original surface by a closed vertical fissure of small dimension. The south and west sides of the upper cave, where most of the human and animal remains were found, were completely choked to the roof with dark black



Brome's sketch of the Genista Cave and fissure. From 'The International congress of prehistoric archaeology: transactions of the third session which opened at Norwich on the 20 August and closed in London on the 28 August 1868'. © Pitt Rivers Museum, University of Oxford



earth. The smallest crevices and fissures in the sides of the cave were full of the bones of animals, birds, fish, land and marine shells intermixed with pebbles and charcoal.

Brome and his prisoner workforce continued to dig and used explosives to blast through three further stalagmite floors, discovering an aperture to the lower caves. A 14m deep natural shaft (named St George's Passage in honour of the date) led to a large cavern at 30m depth, 'The Victoria Hall' and then a further three large caves between 8m and 24m high at a maximum depth of 71m. Human remains were found 'lying in every imaginable direction and position' intermixed with flint instruments, anklet, skewers or arrow-heads, querns and rubstones – the whole was broadly dated to the Neolithic.

The cave complex was named 'Genista' (the scientific name for the Broom plant family) in a typically Victorian pun on Brome's surname. Brome went on to investigate many more caves in Gibraltar and reported his findings to the scientists of the day.



The research has identified the location of Genista I.



Genista Magazine

There are no records of the completed water tank, but Brome's excavations were later expanded to create a new subterranean magazine between

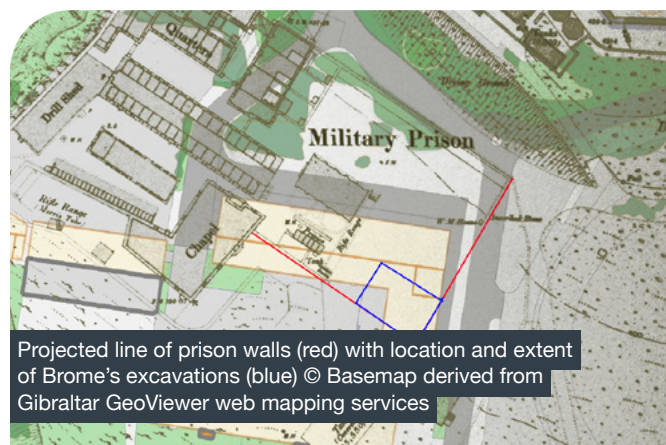
1894 – 1897, destroying the upper cave in the process. Engineering drawings in The National Archive at Kew, show that the magazine comprised two barrelled vaults 23.5ft x 28ft x 18ft high on each side of a central corridor, with a surrounding outer drainage passage and an inner surrounding lamp access passage. The lamps were separated from the powder storage area by shuttered windows set in the walls. There were two external ranges above ground; the east range comprised a lamp room, cooperage and shifting room to the east; the south range contained cartridge and shell filling areas. Access to the magazine was from the east range with separate steps to the lamp corridor and magazine (the magazine steps were lit by windowed lamps accessed from a parallel set of steps).

The magazine levels have been identified and it is highly likely that it survives intact with the roof just below ground level and possibly forming the foundation for the Training Centre; the revealed subterranean steps are predicted to be those leading down into the magazine lamp corridor. There is no reason to think that the lower levels of Genista I were destroyed by the magazine and it is even possible that access might one day be rediscovered via later tunnels within the Rock.

Inscribed Stone

The National Archive also holds an Ordnance Survey map dating to 1910 which shows the military prison with the magazine redacted, but indicates the inscribed stone near one of the boundary walls (now in the course of the modern Buffadero Road). It is possible that the inscription was carved into a large rock, perhaps derived from the cave itself, then inserted into the wall.

The research has identified the location of Genista I, revealed information about the magazine and steps, and given a context for deciding on the new location of the inscribed stone.



Partnership working reduces waste across the MOD



by Glyn Ingram
Managing Director, Side By Side, Aramark Government Services

The MOD accounts for 50% of the UK's Central Government Departments' emissions and is one of the largest waste producers too. Aramark Defence Services, in partnership with Greenzone and the Defence Infrastructure Organisation (DIO) set out to substantially reduce waste and increase recycling, driven by the Greening Government Commitments to reduce the environmental impact of UK Government Departments.

In 2018, 12,368 tonnes of waste was generated across three soft facilities management contracts at 127 locations in the south-east, London, north, Scotland and Northern Ireland. A significant behavioural and cultural change was required to engage 50,000 troops, DIO staff and 3,500 Aramark Defence Services employees.

Aramark Defence Services, Greenzone and the DIO developed and executed a comprehensive waste management strategy across the entire estate, integrating Aramark Defence Services' own sustainability plan 'Be Well, Do Well' into the development of the contract waste management plans.

Greenzone established baseline waste generation and service profiles for each site. Using an evidence based approach, Greenzone used baseline data and service profiles to introduce new service offerings to improve food, glass and dry mixed recycling. The transient nature of the sites' population meant that standardisation was vital and the implementation of the 'bin the bin' campaign was pivotal. Under-desk bins were replaced with centralised bin stations with clear signage supporting segregation to reduce contamination. Coupled with the introduction of food recycling, general waste was significantly reduced alongside an overall boost in recycling.

The team worked tirelessly to engage site leads with the campaigns. By providing waste data, sites were able to implement their own solutions, monitor outcomes and share ideas via a range of traditional and digital platforms. An e-learning presentation was developed, providing insights

into the waste management strategy, enabling a consistent approach and preparing sites for any upcoming changes and segregation requirements.

In the 2018 baseline year, 95.43% of waste was diverted from landfill but only 33.35% of it was recycled. By 2022, 99.35% of waste was diverted from landfill and 48.14% recycled. The introduction of separate food waste recycling services will further reduce general waste and positively impact the progress already made.

The collaboration between Aramark Defence Services, Greenzone, and the DIO showcases a dedication to environmental sustainability and Greening Government commitments. The strategies employed have not only minimised the environmental impact of waste but also set a benchmark for successful waste management practices within the MOD.



Aramark chefs creating dishes from the waste aware menu
© Aramark UK

Promoting Rights of Way on MOD land

by Kathleen Letch-McMillan

Access & Recreation Advisor, Defence Infrastructure Organisation



Access Advisor Kathleen and Trooper Letch at Hogmoor Enclosure © Crown

Hampshire is a county in the south-east of England with a huge network of public rights of way that cross the vast areas of military training estate within the region. These provide a system of paths and tracks that give the public a legal right of access, resulting in military training and the public interacting with each other.

Within Hampshire, several training areas were flagged up as needing upgrades to their public rights of way to enable the public to feel more confident when using them. In turn, this supports improved relationships with the local community and the troops who are training.

The Defence Infrastructure Organisation's Technical Services Access and Recreation Advisory team partnered with the Community Engagement Ranger team from Hampshire Countryside Service to deliver a joint project to improve the waymarking of the public rights of way on MOD land using local volunteers. Borden, Bramshot and Browdown were picked for the first round of improvements and to act as a pilot for future projects. Each site needed additional waymarkers and fingerposts, as well as new information boards to help aid the public to better understand the sites and where the public rights of way are.

The Hampshire Rangers led six volunteers at Borden at the start of September 2023 for the first stage of the project. The group installed 10 new

waymakers and two fingerposts at key junctions on the public rights of way across the site. The other sites' improvements were then carried out in Autumn 2023.

A push on direct public engagement was also needed to educate about public access to the Defence Training Estate, which complements the Respect the Range campaign (*Sanctuary 50, 2021*). Early in 2023, the Access and Recreation Advisory team were invited to deliver an educational stall at the Secrets of the Heath event at Hogmoor Inclosure in Borden. Hogmoor has a long military history linked to having been used for tank training grounds and throughout the World Wars. With a huge local population on its doorstep and several active military training areas, it is a high-pressure area where recreation must be balanced with training activity.

A Trooper from the Household Cavalry supported the team in delivering a highly engaging educational stall. The soldier explained to visitors what training is carried out, the military debris they might find on the training area and the dangers of not following the safety advice given. The children really enjoyed getting to speak to a soldier about how they train.



Installing a waymarker at Borden © Hampshire Ranger Service

Partnership model for nature conservation – West Moors Logistics Centre

by **Jenny Bennett**

Senior Ecologist, Defence Infrastructure Organisation

The MOD estate supports large expanses of wildlife-rich habitat, which exists due to military custodianship of the land, meaning that agricultural improvement has largely been avoided. Much of the estate is statutorily designated for wildlife, conferring significant legal duties for land management. This poses potential trade-offs, the law must be adhered to, but could bring with it restrictions on operational capability and management requirements have the potential to absorb a significant proportion of budgets.

Innovative and bespoke solutions involving internal and external partners need to be found to enable Defence to live, work, train and deploy alongside protecting the incredible natural heritage on the

estate. A successful partnership achieving these aims has been developed at West Moors Logistics Centre in Dorset.

The West Moors site was acquired by the MOD as an ammunition depot in 1938. In 1944, the US Army utilised the site as a Petroleum Depot in support of the Normandy Landings. It returned to the British Army in 1945, becoming a Prisoner of War camp. In 1971, West Moors again became a Petroleum Depot, and continues in this role today operated by UK Strategic Command. The principal roles of the fuel depot are to receive, hold and distribute oils and lubricants; transfer bulk fuels into jerricans; and hold emergency reserves of fuels, lubricants and fuel additives.



Sand lizard © Crown

Much of the 182ha fuel depot area comprises heathland and acid grassland designated as Site of Special Scientific Interest. These habitats support a rich flora and fauna, including all six species of UK reptile. Heathland birds present on the site include nightjar, Dartford warbler and woodlark. Water bodies constructed decades ago to provide an emergency water supply for firefighting support a diverse dragonfly and damselfly assemblage.

The Strategic Command establishment team works alongside its industry partner and with support from Defence Infrastructure Organisation (DIO) ecologists, enabling essential operations and maintenance whilst avoiding impacts to heathland. The grounds maintenance plan incorporates acid grassland management that minimises fire risk, but still supports thriving populations of green-winged orchids and heath dog violets, plus foraging woodlark habitat. Maintenance of the network of pollution control ditches is achieved through sensitive working methodology. Construction operations are carefully planned to avoid impacts.

Heathlands are open landscapes on thin acid soils dominated by heathers, typically with scattered scrub and trees. Historically, heaths were kept open through human activity such as grazing, burning and timber harvesting. Without regular management, most heathlands will rapidly be lost to encroaching scrub and bracken vegetation, resulting in the loss of specialist and rare heathland species.

The Amphibian and Reptile Conservation Trust is a national wildlife charity and the leading body furthering the cause of herpetofauna conservation in the UK. The West Moors site supports important populations of sand lizard and adder, so management of heathland habitat to benefit these species accords with their conservation priorities. Amphibian and Reptile Conservation are able to access Countryside Stewardship scheme funding and have considerable expertise in the management of lowland heath habitat. Heathland within the fuel depot is therefore leased on a peppercorn rent to the charity to undertake this management.

The key focus at West Moors has been to restore the open nature of the heathland, providing a mosaic of vegetation which allows all heathland features to flourish, including pioneer heath and bare ground for rarer invertebrates, reptiles and plants. Over the last three years, the Amphibian and Reptile Conservation field team have cleared 4ha of



dense gorse as part of a capital works package and have created bare ground suitable for sand lizard egg-laying habitat, ranging from strips to small patches with a southern aspect.

Amphibian and Reptile Conservation deploy a team of volunteers to undertake annual smaller-scale habitat management, for example cutting and removal of colonising scrub and trees by hand, and management of a wet heath area supporting the rare marsh clubmoss to retain suitably short open vegetation. Involvement of volunteers adds another positive dimension to the partnership for people by providing training and skills development. The time spent outdoors in nature with like-minded people also provides mental and physical health benefits.

Several environmental specialists sit on the West Moors Conservation Group, contributing biological survey data to inform site management. Their involvement demonstrates there are still exciting discoveries to be made. In 2022, Bryan Edwards recorded dwarf rush. This tiny, autumn germinating annual rush needs thinly covered or bare ground which is kept open by standing water in winter and droughted in summer. Its known distribution in the UK is limited to a handful of sites in Cornwall and Anglesey, which makes its discovery at West Moors all the more remarkable. Conservation management will now be adapted for this very rare species.

The future for the rich natural heritage at West Moors looks bright, given the successful operation of this partnership model. It is a hugely satisfying and exciting site for DIO ecologists to be involved in and the team look forward to seeing the heathland thrive over the coming years.

Building the Climate Change and Defence Resilience Awareness course

by **Ros Cameron**

Assistant Head Climate Change and Sustainability Skills and Culture, Security Policy and Operations



Whole Force climate change and sustainability awareness training is essential for the journey to embedding climate considerations into MOD's policy, processes, decision making and to achieve cultural change. Recent geopolitical events and increasing climate related major incidents added impetus to the pressing need for comprehensive climate change related education, centred on clear facts and military issues around which to build understanding.

The Defence Academy of the United Kingdom, based at Shrivenham and an establishment already actively pursuing sustainability, transformed content for the MOD's Climate Change and Defence Resilience Awareness course into a dynamic, attractive activity to educate its Whole Force audience.

The production of the course was a key objective to give all MOD staff a common understanding of climate science, its relevance to Defence, the MOD's commitments and what this means for their role. Written by Defence people, for Defence people, the course content contains a variety of styles and media, looking to be transformational in amplifying the importance of net zero and resource efficiency in delivering against the government's climate and sustainability agendas.

The course style and wording needed to supersede processes, cultural norms and risk-averse attitudes, to be suitable for use in discussion or private study. It needed to encourage sustainable behaviours, decision makers and strategic planners to think longer-term and consider and choose possibly more expensive options, future-proofing Defence assets and operations.

The breadth of contributors meant coping with a wide range of written and spoken content, whilst under considerable time constraints. From storyboarding to development, the Defence

Academy and Head Office teams collaborated closely to co-develop page linkages, subject matter wording and continually crosscheck, explaining the techniques such that it felt like a productive partnership.

Complex geopolitical issues were brought to life to make them more approachable for the learner, from an animated Russia case study simplifying and explaining resource insecurity, to the creation of a montage of solar and biodiversity images overlaid onto images of military personnel.

The resource hub, a one-stop learning site which forms the basis for a repository of information and resources, was developed exceptionally quickly, going live concurrently with the course. Professional, friendly and deeply collaborative working resulted in a unique, purposeful course and hub that is educating and influencing both pan-MOD and internationally, through interested Allies.

Everyone involved at the Defence Academy went above and beyond to ensure an outstanding final product. The course is available online via the Defence Learning Environment platform.



The header image for the course, showing serving personnel, wind turbines and a solar farm © Crown



HMS Swiftsure in No 2 Dock at Babcock's Rosyth site © Devlin Photo Ltd

Submarine dismantling at Rosyth

by **Laura Cummings**

Communications Business Partner, Babcock International Group

Globally, no country has ever fully dismantled a nuclear submarine. The Submarine Delivery Agency and Babcock are developing a proof of concept which is safe, secure, environmentally responsible and cost effective, to dismantle the UK's de-fuelled, nuclear-powered submarines on behalf of the MOD.

The Submarine Dismantling Project is based at Babcock's Rosyth site in Fife, Scotland. Within this programme, the team has progressively removed Low Level Radioactive Waste from four submarines. The solution that Babcock has implemented for Low Level Radioactive Waste removal, with environmental protection at the core of its process, has created a unique and innovative methodology with learning applied to subsequent vessels.

Over the last seven years, these improvements have evidenced the proof of concept, reducing the risk of pollution and contamination, with the additional benefit of an average of 10% efficiency savings for each vessel. This has paved the way for the removal of Intermediate Level Waste and the confidence to commence the first disposal of a complete UK nuclear submarine by the end of 2026.

A robust and unique method for dismantling, highlighting environmental enhancements, is now available, following our learnings. Rosyth obtained environmental agency approval to commence Low Level Radioactive Waste removal in 2016. Low Level Radioactive Waste

removal from the first submarine (Swiftsure) then commenced in 2016, with the removal of the reactor compartment system equipment through a specialist in-dock installation facility at the dockside. Active waste goes to the active waste accumulation facility, allowing processing and dispatch. Metallic waste goes to a specialist contractor for recycling or disposal. About a third of waste removed from the reactor compartment is out of scope of the nuclear regulation, as it is non-radioactive and therefore can be recycled without further processing following reassurance monitoring.

Between 2016 – 2023, following the first demonstration, a further three submarines had increasing amounts of Low Level Radioactive Waste removed. Annually, an environmental management plan is populated, identifying mitigation methodology and improvements, ensuring environmental protection is prioritised.

The Submarine Dismantling Project team has increased from 50 people in 2016 to around 200 today and is continuously striving to work in the most efficient, innovative and environmentally responsible way possible. Safety underpins everything that the project does and will always be the priority. The team continues to build on the 1,000,000 hours without any reportable accidents, which was achieved in January 2023.

Thank you to everyone who has contributed to the Submarine Dismantling Project – who are at the heart of the programme's success.

Saving the Rotunda at Woolwich

by Chris Daniell

Senior Historic Building Advisor, Defence Infrastructure Organisation



LUCAS, R.W. (FL.1819-52) The Rotunda or New Model Room, built in the Royal Military Repository at Woolwich. Published 1 June 1820
© Royal Collection Trust/His Majesty King Charles III 2023

On 1 August 1814 there were victory celebrations for the presumed final defeat of Napoleon. The day was given as a public holiday and events were held in the Royal Parks; there was a firework display in Hyde Park and a naval re-enactment took place on the Serpentine. As part of the celebrations, a series of tents or pavilions were constructed, designed by John Nash, in the grounds of Carlton House, the home of the Prince Regent who later became King George IV.

The tents were constructed as substantial circular structures which were designed to imitate the colossal Medieval and Tudor military tents. The 'bell tent' roof design was a highly complex system of timbers, which may have provided the inspiration for Brighton Pavilion, also designed

by John Nash. The original decoration of the Carlton House tents had painted canvas roofs with 24-sided polygon timber outer walls. Internally there was no central column and the central area of 34m in diameter was only slightly smaller than the dome of St Paul's Cathedral. The roof structure was an ingenious and complex arrangement of 24 half-trusses radiating from a central, hollow, king post which rose to an octagonal ventilation cupola.

After the celebrations, everything was cleared away, but one tent survived and in 1819 the Rotunda was re-located from the gardens of Carlton House to the military landscape of Woolwich. The structure was substantially strengthened by replacing the timber outer

walls with brick. The complex timber roof structure was supported with additional purlins and rafters.

Internally, decorative ropes leading from the central column were added together with a canvas cloth ceiling lining to replicate the tent structure. All this new material added to the weight of the roof structure, so a large, central, Doric column was installed which remains an eye-catching feature to this day.

Behind the Rotunda was the world's first military training area, called Repository Woods, where the Royal Artillery practiced moving cannons and artillery over difficult and steep sided terrain. In front of the Rotunda was a linear line of practice walls, banks and ditches for the artillery to train. The former linear training fortifications are now designated as a scheduled monument.

The use of the Rotunda changed over the years, at one point being used as a boxing gym and then part of the Firepower Museum. After the museum moved away, the Rotunda was left empty for a number of years. Historic England have classed the building as 'At Risk' and added it to the Heritage At Risk Register, with a key consideration being the lack of use and the state of the roof.

However, the full extent of the repairs needed to the roof was hidden behind the hanging cloth canvas. The initial requirement was to see the extent of roof repair needed, which was made more difficult because the hanging canvas had collected large amounts of stagnant water. The first task was therefore to safely drain the water by making small holes in the canvas to collect



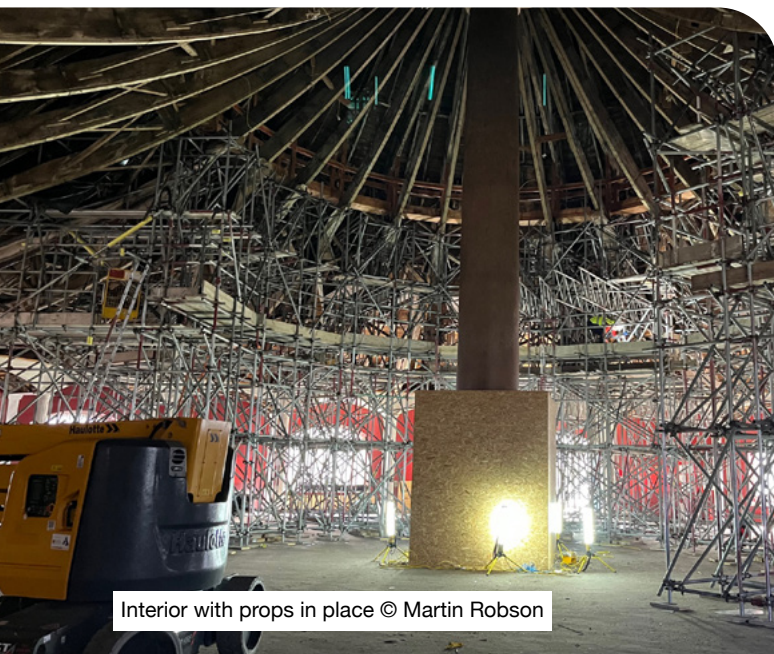
The Rotunda © Martin Robson

the water. Once drained away, larger sections could be removed to see the interior of the roof. Despite initial concerns, there was not much water damage, but it became evident that the structural integrity of parts of the roof could fail. An analysis of the timbers was therefore carried out and it was determined that the roof needed considerable propping. A total of seven trusses had to be propped as a result of the partial collapse of truss 20, due to the failure of a lower truss tie member.

As the building timbers are an interlocking system, each supporting the other, a highly complex scheme to support the roof was carefully devised. The propping was installed using acro-props, which resulted in a complex, dense and visually highly impressive scheme of roof support. The outcome is that the building is now stabilised and is ready for further works to take place.

The next phase will be to dry out the building. This will involve several components. The first will be to increase the ventilation, to allow an increased air flow to both dry out the building and then carry the moisture outside. With suitable permissions through a Listed Building Consent application, currently with Royal Borough of Greenwich, some panes of glass will be removed, and thin mesh installed to stop insects and other wildlife colonising the space. A modern carpet covering the floor had become very damp and will need to be carefully removed too.

Today the Rotunda is in a much better state. The roof is propped to support the timbers and it is drying out. It is being prepared for disposal to a new owner who can put the property back into a viable use to secure its future for the next 200 years.



Interior with props in place © Martin Robson



Reviewing documents on Op Nightingale's Lost Village of Imber excavation © Harvey Mills Photography

Capturing the past – the photography of Harvey Mills

by Richard Osgood
Senior Archaeologist, Defence Infrastructure Organisation



Veteran volunteers at Avon Camp provide shade for the archaeological photography © Harvey Mills Photography

In 2014, the Defence Infrastructure Organisation (DIO) worked with the Royal Artillery on a project commemorating the centenary of the start of World War I. Supported by the National Lottery Heritage Fund, a team examined the remains of a horse hospital with local schools, service personnel and families, and veterans of the recovery project Operation Nightingale.

The programme, entitled 'Digging War Horse', was in need of high-quality imagery for the various project outputs and this is where the team first encountered Harvey Mills. Harvey is a professional photographer based in Winchester and he had asked if he could support the Op Nightingale programme. He volunteered to donate his skills to the work of this project and to enable the DIO to use all his superb images, for no charge, in subsequent publicity and publications.

Most of the Op Nightingale reports are now dominated by his incredible work and they are also the main feature of presentations given by DIO archaeologists, as well as accompanying the articles they write. Harvey's images have been found throughout *Sanctuary* magazine for many years – they have been on the cover of the magazine, on banners promoting the Awards, and across social media coverage; you will probably recognise the contributions.

He takes all the photographs himself, processes and catalogues them and has often been called on by MOD staff when an urgent image of a staff member with a Minister or senior official is required! It is often remarked that we all see the same things that Harvey does, but he can already picture a photographic composition, and can tell the story of a project with his results – most importantly, documenting the people involved and their stories.

“
Harvey can now be considered to be at the forefront of archaeological photography.
”

Harvey taking photos at Op Nightingale's dig of a B17 bomber in Suffolk © Richard Osgood



Examining a skull found on Rat Island in 2023 © Harvey Mills Photography



His photographs have also been vital in the publication of *'Broken Pots, Mending Lives: The Archaeology of Operation Nightingale'* with all monies raised going to military charities. Harvey has worked across the UK on MOD sites from Lulworth to Salisbury Plain, and Northolt to Portsmouth. Although specialising in a range of eclectic topics from skateboarding to landscapes, Harvey can now be considered to be at the forefront of archaeological photography – both site work and also finds recording. As such, he gives tutorials on this discipline to people in the industry.

“
The MOD is incredibly fortunate in having been able to call on Harvey's talents for a decade. His work has been invaluable to the success of many projects.
”



The bleakest barrow: challenging excavation work at the Neolithic Boles Barrow on Salisbury Plain © Harvey Mills Photography



Photographing the Bulford Kiwi from the rear door of a Chinook helicopter, during Ex Kiwi Refresh 2023 © Harvey Mills Photography

Explosive tree felling at Scraesdon Fort

by Andy Westcott

Commandant Cornwall, Defence Training Estate

Scraesdon Fort is a nationally designated scheduled monument and Grade II listed building. It is part of the Antony Training Area which spans the Rame Peninsular joining the River Lynher and the English Channel. The whole is a very important feature for estuary, shoreline, and sub-terranean training, particularly for the Royal Marines Commando Training Centre.

Scraesdon Fort offers all of these opportunities but the fine balance between military training, historic monuments and environmental considerations was seriously upset by the presence of trees suffering from ash dieback. This created a complex situation that threatened the training area, the fort and the environment, and there was no apparent solution – an impasse.

The fort is on the Heritage at Risk Register primarily due to scrub/tree growth. Diseased and unstable trees are a significant risk factor to



Placing the charges on the trees
© Jayne Wraxall



After felling! © Jayne Wraxall

monuments. Arboreal experts advised that the training area would have to be closed due to the risk from unstable ash trees; those in the fort having been identified as being at the highest level of hazard. Rapid death of mature ash trees, with subsequent brittleness in the crown, leaves trees prone to collapse and the shedding of large branches without warning. This is a significant health and safety risk for service personnel training in the vicinity.

The Defence Infrastructure Organisation has a strategy for the management of ash dieback on the UK Defence Training Estate. This precludes felling diseased trees from the ground and alternative safe systems of work all involve mechanical tree shears, with overhead protection for operatives, or high-level working platforms. The layout and topography of the fort restricts access to the trees for such specialist equipment. Hence the impasse and a hurried search for alternative means.

It was suggested that the Royal Marines Assault Engineers could practise their skills by explosively felling the trees. Described by their Commanding Officer as a “Hoofing training opportunity”. They gave great support with unbridled enthusiasm. Eventually the suggestion was taken seriously and there followed two years of anxious wrangling and demonstrations to obtain scheduled monument clearance from Historic England, conduct bat surveys and get general agreement that there would be no significant collateral damage to the surrounding flora and fauna.

Three successful exercises have taken place with more to follow. The training area is in use, the fort is still standing and the natural environment is as healthy as ever. Balance has been restored.

Soil health, prey and predators – dung beetles and bats on Salisbury Plain Training Area

by Jenny Bennett and Gareth Harris

Senior Ecologist and Ecologist,

Defence Infrastructure Organisation and Wiltshire Bat Group/Gareth Harris Ecology and Conservation



The greater horseshoe bat, which forages on dung beetles
© Daniel Hargreaves

One third of Britain's most highly threatened mammal species are bats, due to historic population declines. Bats such as greater horseshoe and serotine are insectivorous (insect eating) and strongly associate with livestock farming, pastures and extensive grasslands. Dung beetles are an important part of their diet.

Dung beetles get their name from their diet of animal droppings. They are an integral part of soil health and nutrient cycling. They improve soil aeration and quality, recycle dung, suppress parasites, and improve the nutritional value of pasture. Different species associate with different habitats and with different sources of dung, including cattle, sheep, horse, rabbit and deer. In recent years, there has been an alarming decline in dung beetle fauna. Just over 25% of UK dung beetles are Nationally Rare and four species may have become extinct in the past 50 years. A significant factor in the decline of dung beetles is the use of veterinary parasiticides used to treat cattle against endoparasites (worms and fluke). These are excreted largely unmetabolized in cattle faeces for approximately 1 – 4 weeks after treatment, where they continue to have insecticidal effects.

Salisbury Plain Training Area supports a vast area of botanically rich grassland, including 40% of Europe's lowland chalk grassland. The flora has been well studied over the years. However, until this project, there was scant baseline information available about bats and dung beetles on the Plain. In 2021 and 2022 the Defence Infrastructure Organisation (DIO) provided Conservation Stewardship Funding to Wiltshire Bat Group for bat and dung beetle surveys on the training area, which was also supported by a Conservation Group Grant. The work was undertaken as part of the South Wiltshire Greater Horseshoe Bat Project, established to promote bat conservation and favourable land management.

Passive acoustic surveys were undertaken (using static bat detectors) alongside sampling cow pats using the flotation technique. This involves selecting cow pats of the appropriate age, putting them in water and swirling them around. The dung beetles then float to the top! Acoustic data was analysed by Gareth Harris and beetles were identified by Marc Arbuckle, Wiltshire County Recorder for Coleoptera.

Over 127 nights 15 sites were surveyed, generating 20,307 bat passes identified to species level.



Geotrupid dung beetle, also known as a dumbledor beetle
© Peter Thompson



English longhorns, which support a diverse dung beetle assemblage © Peter Thompson

12 bat species were recorded, with nine of these comprising UK priority species and/or included on the Red List: greater horseshoe, whiskered/Brandt's, noctule, Leisler's, serotine, soprano pipistrelle, Nathusius' pipistrelle, brown long-eared and barbastelle. Bat species foraging upon dung beetles accounted for a significant proportion of the bat activity, particularly noctule and serotine bat, but also Leisler's and greater horseshoe bat.

There were 3,030 dung beetles identified, including Geotrupidae and Onthophagus species, known as 'tunnellers' as they dig a tunnel in the soil beneath the dung pile and Aphodiinae species, the 'dung dwellers' as both adults and larvae live in the main mass of the dung. Species of particular note included *Onthophagus joannae*, *Agrilinus constans* and *Nimbus obliteratus*.

Working with the farming community is an important aspect of this project, promoting the importance of dung beetles in soil health, animal husbandry and their role in the wider food chain. A training day was delivered in September 2022, presented by Wiltshire Bat Group, DIO, Plain Conservation and the Porton to the Plain Farmer Group. Speakers included Sally-Ann Spence and Max Anderson from Dung Beetles for Farmers, introduced by Gareth Harris.

A questionnaire was also circulated to the farming community concerning techniques employed on the Plain to manage endoparasites in livestock. This highlighted that a significant area of the training area is organic, use of anthelmintics is already low, and farmers already employ a range of best practice techniques as part of an Integrated Parasite Management toolkit.

Results to date indicate that Salisbury Plain Training Area supports a diverse and healthy assemblage of dung beetles. These, and other invertebrates in turn, support a diversity of bats including rare species such as greater horseshoe bat and serotine bat. The extensive grasslands of Salisbury Plain are likely to support very high and potentially nationally significant numbers of foraging bats.

As well as demonstrating the previously unrecorded conservation significance of Salisbury Plain for dung beetles and bats, the project results indicate a good news story in terms of wildlife-friendly grazing management. The training area's graziers are working hard to support their natural environment, for example, minimising their use of anthelmintics, promoting good animal husbandry and soil health. That the farming community is already going to such lengths should be both welcomed and recognised.

Delivering social value for Clyde Commercial Framework



by **Suzanne Stevenson**

Social Impact Advisor, GRAHAM Building North

As part of the Clyde Commercial Framework, GRAHAM Building North (GRAHAM) undertook construction of a new £34 million Submarine Escape, Rescue, Abandonment and Survival training building for the Royal Navy. Situated within HMNB Clyde near Helensburgh in Scotland, the project achieved a Considerate Constructors Certificate of Excellence through 'excellent' and 'exceptional' scores across the five sections of the scheme's Code of Considerate Practice.

GRAHAM undertook significant investment in their own workforce for the project. This included employment of a graduate engineer and two trainee engineers, as well as investing in the upskilling of existing employees by utilising Scottish Vocational Qualifications in supervision/management.

'Delivering lasting impact' is GRAHAM's guiding principle and this overarching focus extended to the framework. GRAHAM had extensive community involvement, which due to the high security nature of the works took place outside of the project, as well as in the delivery of wider social value. Working collaboratively with the Defence Infrastructure Organisation, GRAHAM complied with the requirements of the Social Value Model for the HMNB Clyde programme of works to develop a Social Value Plan which included the recruitment of local people, delivering STEM events and learning interventions at local primary schools to encourage environmental protection and improvement.

A certificated, 12-week construction careers awareness programme was delivered in partnership with Ayrshire College, with work experience provided by GRAHAM. Feedback was fantastic and there are future Women into Construction programmes in the pipeline, after the success of this one to help increase representation in the workforce and tackle workforce inequality.

GRAHAM employees also undertook two volunteering days to clean up the local beach

environment and donated and installed passive infrared sensor security lights and floodlights at the local bowling club. The team participated in a kilt walk too – raising over £900 for charity and collaborated with Community Wood Recycling to create jobs and training for disadvantaged people.

Throughout the Submarine Escape, Rescue, Abandonment and Survival project the team engaged with local trades, commissioning circa £14.65 million of work from local sub-contractors including diverse small and medium enterprise supply chain. This significant spend inevitably has a positive impact on community integration, where local people were employed where possible, in roles including site logistics and administration which were critical to the successful delivery of the project.

Despite the security related limitations in community engagement around the project – there has certainly been valuable integration of GRAHAM into the community through supporting local people and initiatives. Since the scope of the MOD reaches far beyond the local community, this commitment to the local supply chain and local employment has enhanced the organisation's reputation through supporting businesses and people in the surrounding areas.



Using equipment at a Women into Construction event © GRAHAM

Who was that mysterious man? A rock carving at Otterburn

by Alex Sotheran and Phil Abramson

Archaeology Advisors, Defence Infrastructure Organisation

Early in 2022, Matt Amy, an archaeologist working for JBA Consulting, was carrying out a condition survey of the archaeological scheduled monuments on Otterburn Training Area in Northumberland. By his own admission, Matt is an obsessive rock climber and boulderer and is drawn to rocky outcrops for “a poke around”. On this occasion, his obsession chimed with his career as an archaeologist... On a rocky outcrop in a remote part of the training area he had the good fortune to, quite literally, stare into the face of an unknown soldier.

When archaeologists talk of rock carvings, they generally refer to the small circular indentations called cup and ring marks, pecked and ground into rock surfaces in the Bronze Age, circa 1800 BC. The carving Matt found was of an altogether different nature. More like AD 1800 and, more precisely, the 1870s. On a large boulder overlooking the rugged Northumberland moorland, the face and upper torso of a Victorian era soldier provided an archaeological mystery ripe for unravelling.

Initially it was thought this was a new discovery, but research by David Jones of Coquetdale Community Archaeology uncovered the fact that the carving was first spotted by John Philipson, a local antiquarian, back in the 1980s. Discussion with David confirmed that John had identified the soldier as possibly Prussian, sporting an Iron Cross. Interestingly, the carving appears to be ‘signed’ by an Andrew Buglass. The placename ‘Barrow’ and a date of ‘August 28th 1872’ are also carved into the rock.

1872 is the year following the Franco-Prussian War and with Andrew’s name carved so prominently and closely to the portrait, it seems likely he was the artist. As it is unlikely that Prussian soldiers would be around Northumberland in 1872, maybe he saw the Prussian uniform in a book or newspaper? Census research showed that one Andrew Buglass was a 47-year-old shepherd who had moved close to the Otterburn area near Biddlestone. However,



The mysterious face in the rock, is this a likeness of a Prussian soldier? © Phil Abramson

David thinks that the portrait may have been carved by Andrew senior’s son, another Andrew, who was 14 years old in 1872.

28 August 1872 was a Saturday. Was this mysterious carving created by a teen lad, enjoying the sun and taking time off either from school or work? We may never know the answer, but the mystery remains carved in the rock!

A note from the editors:

In 2023, Phil Abramson retired after 19 years as a MOD archaeologist. We are most grateful to Phil, who has penned numerous *Sanctuary* articles over the years and whose enthusiasm for archaeology is infectious! We wish him every happiness in his retirement.

50 years of sustainability and conservation in the MOD

by Julian Boyce

Environment and Sustainability Communications Officer, Defence Infrastructure Organisation

The 1971 – 1973 Nugent Committee, chaired by Baron Nugent of Guildford, examined the necessity and management of Defence land holdings. It recognised the importance of military land for supporting wildlife and heritage and recommended the MOD do more to reduce its environmental impact. It also highlighted the need to actively manage wildlife, heritage and the increasing demands for public access.

The Nugent Committee provides an insight into the origins and approach to achieving a sustainable MOD estate, a conservation approach that continues to evolve and build from the foundations laid 50 years ago.

The roots of a sustainable MOD

In 1973, the first MOD Conservation Officer was appointed. Lt Col (Ret'd) Christopher Norman Clayden was considered perfect for the role. He had recently retired as an Army Officer and was a keen naturalist, with 20 years' experience as Chair of the Army's Ornithological Society (see *Sanctuary* 44, 2015).



One of Jean Clayden's sketches of a butterfly, ant and flora © Jean Clayden

The original *Sanctuary* door knocker front cover design © Crown



MOD Conservation Groups were quickly formed to liaise with external organisations, develop land management plans and implement practical conservation measures. Within two years, 35 groups had been established.

Work started on a newsletter to provide a roundup of activities across the MOD estate and in January 1975 the first edition of *Sanctuary* was published. The name was derived from the ancient tradition of rights of sanctuary, which enabled protection from arrest in places of worship. A new interpretation was about offering sanctuary to flora and fauna on MOD property. The front cover design for the first 12 years was based on Durham Cathedral's sanctuary door knocker and designed by Lt Col (Ret'd) Clayden's wife, Jean.

Decades of *Sanctuary* provide a record of the efforts and achievements of the Conservation Groups, and also how the MOD has responded to the pressing environmental issues of the day.

Within 10 years, two thirds of the MOD estate had been surveyed and catalogued for its wildlife and archaeology, involving over 4,000 volunteer members of 179 Conservation Groups. In 1986,



Decades of Sanctuary provide a record of how the MOD has responded to the pressing environmental issues of the day.



Col (Ret'd) James Baker took over the role of MOD Conservation Officer, after retiring as an Army Officer. He stayed at the helm for 16 years (see *Sanctuary* 39, 2010). By 1993, 37 Sites of Special Scientific Interest (SSSIs) had been designated across the MOD estate (there are 160+ in 2023), and *Sanctuary* editions regularly described archaeological features not recorded anywhere else, or highlighted species that were thought to have been lost.

An evolving approach to sustainability

During the 1990s, increasing legislation and policy commitments meant the MOD could not rely solely on voluntary Conservation Groups' efforts, and needed to improve how it embedded environmental management within the department. This led to the employment of full-time specialists.

In 1991, the Commandant of Otterburn Training Area donated the Silver Otter Trophy to be awarded to the best Conservation Group led project, or best individual conservation effort, on MOD land. Over the years, the Sanctuary Awards expanded to recognise the wider sustainability agenda.



In 2015 the *Sanctuary* team visited Jean Clayden and were lucky enough to see first-hand some of her original paintings © Crown

In 2000, a permanent, internal team of environmental specialists was formed to advise and support plans, projects and activities across the MOD.

As the concept and practice of sustainability has evolved, so too has *Sanctuary*, with an increasing focus on the social and economic pillars of sustainability. This has been reflected in an abundance of articles on sustainability, from reports into Defence wide activities in support of the Greening Government Commitments and other key government targets, to articles exploring the work of the MOD's industry partners in stewardship of the estate and sustainable procurement across the UK and overseas.

Rising to the climate change and sustainability challenge

It has become ever more apparent that a sustainable MOD is about long-term planning and prudent use of our resources and assets, while addressing the significant challenges and security concerns posed by climate change.



One of Jean Clayden's paintings of Longmoor, the first site to have a Conservation Group © Jean Clayden

In 2021, the MOD Climate Change and Sustainability Strategic Approach was published, the culmination of a ten-month report chaired by Lt Gen Richard Nugee, Defence Climate Change and Sustainability Review Lead.

The Strategic Approach argued that the MOD must redouble its efforts to combat climate change and address sustainability issues – not only because we must all reduce the impact we are having on the climate, but also because Defence will become less effective if it ignores how the environments it operates in are changing.

The MOD Directorate for Climate Change and Sustainability was established in 2021, which coincided with increased political engagement with the climate change agenda. The directorate quickly set to work embedding sustainability and climate in strategy, policy and process, and in supporting and enabling stakeholders to ensure that Defence plays a full role in contributing to net zero. In its first year, the new directorate developed a comprehensive view of Defence's emissions footprint and worked to support the building of capacity and capability

across the MOD. The Defence Suppliers Forum was created, providing a collaborative space to develop and share best practice for Defence and the wider defence community.

The directorate continues to accelerate its pace of work in response to the challenge, including embedding environmental sustainability into Defence's policies and processes, rolling out a coherent education strategy and fully integrating climate risks into planning activities.

A Whole Force approach

All areas of the MOD are committed to meeting Defence's sustainability targets and the consideration of Defence's impact on the environment is being embedded in all that the MOD does.

Naturally, the sustainable management of the Defence estate itself will continue to be of vital importance. Today, the MOD has direct responsibility for managing almost 1% of the UK land area, and is steward of an estate which comprises 169 SSSIs, 31,000ha across 13 National Parks, 19,000ha of National Landscapes (formerly called Areas of Outstanding Natural Beauty) across 33 sites, as well as 771 scheduled monuments and 853 listed buildings.

From the first Conservation Groups in the 1970s to the establishment of the Directorate of Climate Change and Sustainability in 2021, the MOD's approach to sustainability has centred on the premise that sustainability and Defence are not incompatible. With tackling climate change and biodiversity loss now the UK Government's number one international priority, this approach is more important than ever. The UK's commitment requires Defence's full involvement, and the MOD is committed to playing its part. The pages of *Sanctuary* will continue to highlight the critical role that all sections of the MOD play.

A note from the Editors:

We were saddened to hear of the death of Jean Clayden this year. Her dedication to supporting the establishment of MOD Conservation Groups has lasting implications to this day. She was instrumental in the creation of *Sanctuary* magazine, with her sketches appearing throughout the decades. The team interviewed Jean in 2015 (see *Sanctuary* 44, 2015) and are pleased to include her artwork with this article. We send our deepest sympathies to her family.



One of Jean Clayden's sketches of a barn owl
© Jean Clayden

Sustainable MOD timeline

- 1973 First **MOD Conservation Officer** appointed.
- 1974 First **MOD Conservation Group** established.
- 1975 First **Sanctuary magazine** published.
- 1991 **Sanctuary Awards** established.
- 1992 **The Earth Summit** is held in Rio de Janeiro.
- 1994 UK publishes first national **Sustainable Development strategy**.
- 2002 **MOD's Appraisal Handbook for Sustainability and the Environment** published.
- 2004 **Framework for Sustainable Development on the Government estate** published.
- 2005 **Sustainable Operations on the Government Estate** published.
- 2005 **MOD's first Sustainable Development Annual report** published (2003 – 2004).
- 2006 **In Trust and On Trust**, MOD's estate strategy published.
- 2007 **MOD Sustainable Waste Management Strategy** revised.
- 2008 **Climate Change Act 2008** comes into force and **MOD Climate Change Strategy and Action Plan** published.
- 2008 **MOD's Sustainable Development strategy** published.
- 2009 **MOD Sustainability and Environmental Appraisal Tools Handbook** published.
- 2010 **MOD's Climate Impacts Risk Assessment Methodology (CIRAM)** developed.
- 2010 **National Security Strategy/Strategic Defence Security Review** published.
- 2010 **MOD Departmental Adaptation Plan for Climate Change, Waste Strategy, and Sustainable Procurement Strategy** published.
- 2011 **Greening Government Commitments** published.
- 2011 **MOD Sustainable ICT policy** published.
- 2011 Army Orders on the **Organisation and Arrangements for the Management of Sustainable Development in Land Forces** published.
- 2012 **Rio +20**. The global community reconvenes 20-years after the Earth Summit.
- 2013 **Sanctuary rebrands** from MOD's conservation magazine to a sustainability publication.
- 2015 **Act and Evolve – the Sustainable MOD Strategy** issued.
- 2015 **MOD's Sustainability and Environmental Appraisal Tools Handbook** updated and published.
- 2018 **25 Year Environment Plan** published.
- 2021 First **virtual Sanctuary Awards** ceremony held (to celebrate the 2020 awards).
- 2021 **UK Net Zero Strategy: Build Back Greener** published.
- 2021 **Environment Act 2021** sets out legally binding environmental targets.
- 2021 **United Nations Climate Change Conference (COP 26)** held in Glasgow.
- 2021 **MOD's Climate Change and Sustainability Strategic Approach** published.
- 2021 **MOD's Directorate for Climate Change and Sustainability** established.
- 2021 **DIO's Sustainability Strategy** published.
- 2021 **First solar farm** on the British Army estate delivered.
- 2021 Royal Navy fits **catalytic reduction to River Class Offshore Patrol Vessels**, which can reduce nitrous oxide emissions by up to 97%.
- 2021 British Army's **Foxhound and Jackal vehicles test hybrid electric drive lines**.
- 2022 A RAF **Voyager aircraft flies on 100% sustainable aviation fuel**.



An alpine scene following conservation treatment © Crown

Longing for freedom – the art of Prisoners of War at Sennybridge



by Kathryn Sayner

Historic Buildings Advisor, Defence Infrastructure Organisation

Painted on walls inside of the cookhouse at Sennybridge Camp in Wales are four large and impressive murals believed to be created by German Prisoners of War (POWs) between 1944 – 1948.

The military training camp, nestled between the Bannau Brycheiniog National Park (Brecon Beacons) and the Sennybridge Training Area, was constructed from March 1940. The layout of the original World War II camp remains highly legible with many of the original buildings still standing and in use today.

During World War II, many German and Italian soldiers were captured in action. At the outset of the war, the small number of German POWs were sent overseas to countries such as Canada and later, the USA. It was after July 1941, when larger numbers of Italian POWs were captured in the Middle East, that they were brought to Britain.

Following the D-Day landings in France and the end of the war, vast numbers of German POWs were brought to the UK. Those held overseas were also returned to Britain, increasing the total numbers of POWs to more than 400,000. Camps

such as Sennybridge were utilised to house both the German and Italian POWs during this period. In accordance with the Geneva Convention, the POWs undertook non-military work such as agriculture and construction. Working in companies formed by nationality, both the German and Italian POWs were engaged in improving facilities across the Sennybridge Range, constructing roads, bridges and culverts.

The murals were painted by a POW thought to have been an accomplished artist. The impressive, and evocative landscape scenes were created using oil paint and, due to limited materials, even food colouring. While there were both German and Italian POWs serving at the camp, the wall paintings are thought to be by German POWs; they tended to favour landscape scenes, whereas Italian POWs preferred religious symbols and striking portraits of women.

The location of one of the paintings has been identified as the famous German landmark, Heidelberg Castle with the Old Bridge in the foreground – a sentimental gesture, capturing a scene from a cherished postcard. The other three paintings capture alpine scenes.

The murals are in the cookhouse, a communal space for the POWs, and serve to illustrate the social history of the POWs' time at the camp. The remarkable survival of the wall paintings, and their presence in a building still in use as a meeting place on the military camp, further demonstrates the importance of the artwork.

Factors such as age, inappropriate past intervention and the high moisture levels in the walls had caused the paintings to fall into a state of deterioration. A report was undertaken by a team of paint conservators to assess the condition of the wall paintings, identify the cause of the deterioration and recommend a set of conservation work to stabilise, consolidate and repair the murals.

In 2021, funding allocated from the Defence Infrastructure Organisation's (DIO) Conservation Stewardship Fund enabled a programme of specialist paint conservation by Foley Conservation to commence.

Specialist techniques to stabilise and consolidate the paint involved the application of Japanese tissue to secure areas of damaged paintwork. Previous inappropriate layers of impermeable varnish were carefully removed and, following infilling and inpainting of cracked and missing sections of paintwork, a breathable protective coating was applied.



Conservation treatment to the Heidelberg mural
© Foley Conservation



The Heidelberg mural following conservation treatment © Crown

During the sensitive cleaning process, remnants of the original border detail to the murals were discovered. The decorative frames had previously been painted over with modern paint and were in a variable state of repair. The decision was made to reinstate the frame to just the Heidelberg mural which was found to be more intact, and stencils were prepared to ensure the design was accurate.

Work was also undertaken to improve the internal environmental conditions in the cookhouse. The paintings were vulnerable to the open cooking environment and so the open floor plan was subdivided to separate the paintings from the kitchen area. The storage heaters situated directly beneath the paintings were relocated away from the murals and replaced with energy efficient units. Other building improvement works included upgrades to the outer wall finishes, insulation and rainwater goods.

Additional DIO Conservation Stewardship Fund monies were secured to install an interpretation panel to engage and inform visitors to the cookhouse regarding the importance of the murals and the POWs' time at Sennybridge.

The nostalgic paintings are reminiscent of a missed home at peace and with freedom. The stirring scenes captured by the POWs form an important piece of history; on a camp far away from home the POWs chose to leave a lasting reminder of their presence there during a time of conflict and unrest. This is an idea that will strongly resonate with every soldier visiting the camp today.

These successful projects have been a collaborative process between Landmarc Support Services and DIO, with invaluable input from Roger JC Thomas and Mark Khan.

20 years of bird surveys on Strensall Training Area

by Nigel Boatman and Peter Reed

Volunteer Surveyors, Strensall Training Area Conservation Group



A Woodlark © Alan Swain

The 660ha Strensall Training Area, also known as Strensall Common, is situated near the village of Strensall, north of York. It is a Site of Special Scientific Interest and a Special Area of Conservation. Vegetation is primarily lowland wet and dry heath with acid grassland in the southern part and some woodland and scrub, with scattered birches and clumps of Scots pines. There are several ponds and parts of the training area are grazed in summer by sheep and cattle. The MOD's ecologists oversee the site's conservation management, with the assistance of Strensall Conservation Group.

Surveys of birds on the training area have been carried out using standardised methodology since 2003. The results for 2003 – 2009 were reported in *Sanctuary 39*, 2010. This article covers the years 2010 – present.

Surveys are carried out annually by several surveyors on a single day in early to mid-May so that the whole area can be covered at the same time. Each surveyor follows a specific route, and records all birds seen or heard during the walk on a map of the area covered. Evidence of breeding is also recorded using a range of codes that indicate some form of territorial behaviour. These are used to estimate the number of territories for each species. Results are reported to the Conservation Group and entered into the British Trust for Ornithology's 'BirdTrack' database via an online data input facility.

In 2020, no survey was carried out because of COVID-19 restrictions, but enough records were obtained to build up a picture of the numbers of territories for the more important species. Reports of additional species seen during the breeding season are also collected. Nocturnal species are monitored by visiting at dusk on several occasions. Nightjar is the main focus of these visits, but other species are also recorded.

In the 2010 article, it was reported that numbers of stonechats had increased to eight pairs in 2008. However, they disappeared during the severe winter of 2009 – 2010 and did not reappear again until 2015. Since 2017, numbers have remained fairly constant at between two and four territories each year.

Woodlark, a rare species which is specially protected under Schedule 1 of the Wildlife and Countryside Act 1981, has fluctuated between zero and six territories since 2010. Tree pipit numbers varied over the years but appear to show a slight increase overall. This contrasts with a 43% national decline in England between 2011 – 2021.

Territory numbers of yellowhammer have remained low but with some evidence of a recovery since numbers declined between 2013 – 2018. Numbers of skylark territories have fluctuated considerably, but with no apparent overall trend. Cuckoo territories have also remained stable, with some indication of a slight increase. This is despite a large decrease in numbers nationally, with a 71% decline in England between 1995 – 2021, and regionally of 66% in Yorkshire and Humber. The most likely explanation is that the caterpillars of large moths on which cuckoos feed are still present in good numbers at Strensall, whereas they have declined in the wider countryside.

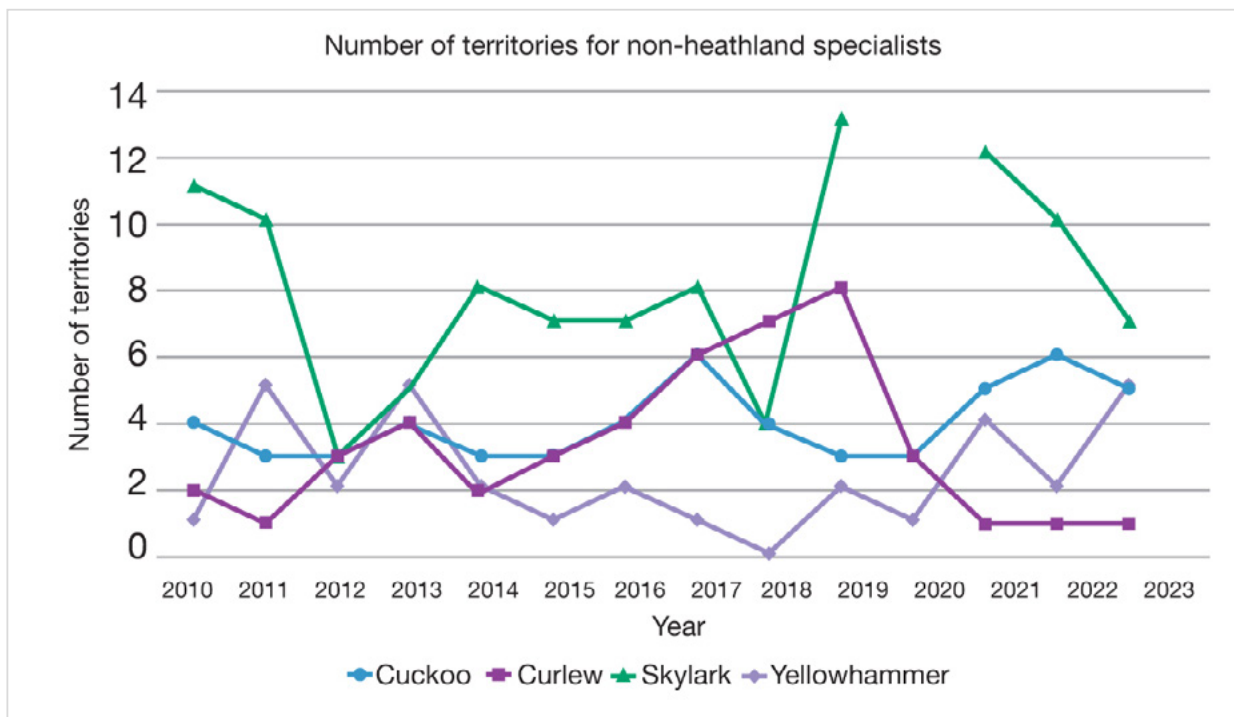
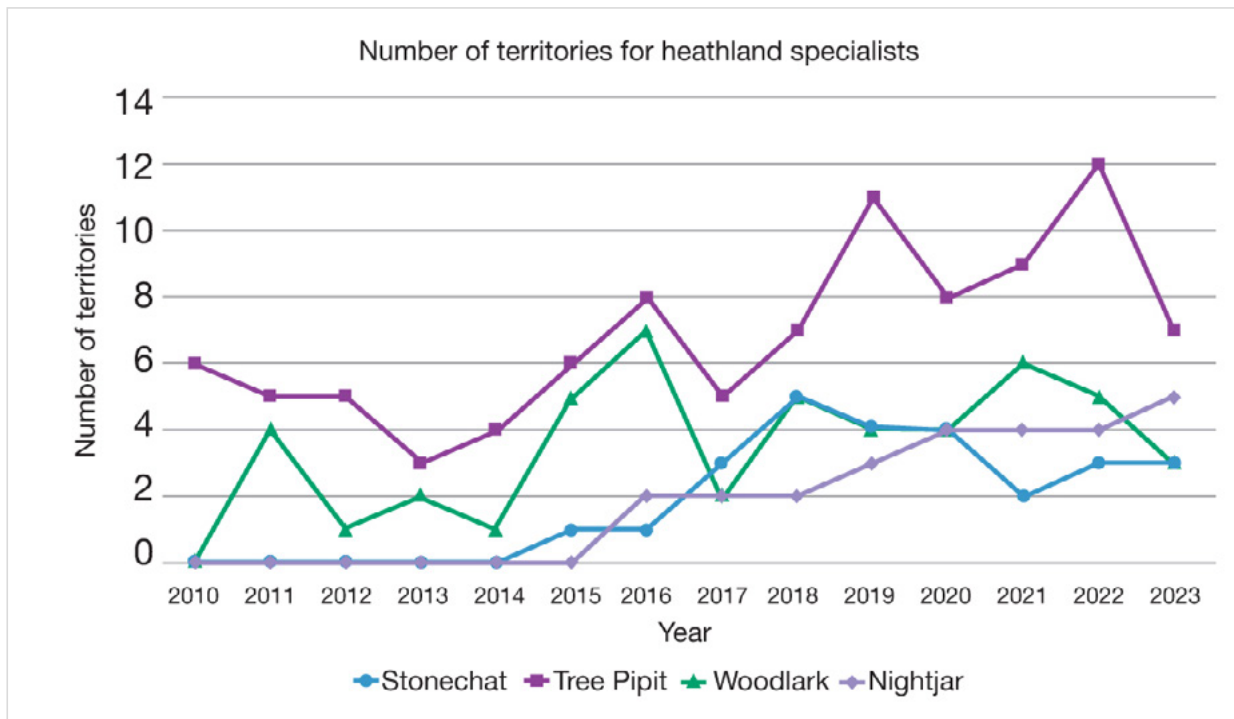
In contrast curlews, which increased up to 2019, have declined dramatically at Strensall with only one territory found in each of the last three years. Curlews have also declined nationally, mainly due

to habitat loss. It is possible that their favoured habitats on the training area have become drier in recent years, but disturbance by dogs is also a possible factor. All of these four species are on the Red List of Birds of Conservation Concern.

Other species recorded annually during surveys include blackcap, garden warbler, chiffchaff, willow warbler, linnet, reed bunting, song thrush and buzzard. Species recorded in at least some years include barn owl; tawny owl; long-eared owl; kestrel; hobby; sparrowhawk; woodcock;

snipe; reed, sedge and grasshopper warbler; little grebe; tufted duck; teal; oystercatcher; heron; little egret; great spotted, lesser spotted and green woodpecker; whinchat; spotted flycatcher; jay; stock dove; bullfinch and grey partridge.

This article illustrates the importance of Strensall Training Area for a number of rare and declining bird species. Their changing fortunes indicate the importance of continued monitoring, vigilance and site management to ensure their conservation.





Soldiers on the final phase of an exercise on Ole Naishu Ranch © BATUK

Ole Naishu Kenya – protecting people, protecting wildlife

by **Mike Roberts**

General Manager, Ole Naishu Limited

Ole Naishu is a 30,000 acre ranch in Laikipia, Kenya, where cattle and wildlife coexist along with British Army training exercises. Cattle, elephants, lions, leopards and buffaloes, among others, roam across grassy plains and through forested hills. The British Army Training Unit Kenya routinely use the ranch for the final phase of their Battlegroup exercise.

Several years ago, a 15km trench was dug along the Ranch's eastern boundary to protect the area from the influx of pastoralist cattle during a challenging political time. The original barrier of a planted invasive cactus, *Opuntia exaltata*, and a mesh fence was not effective against the invading livestock. The trench addressed this security need but unfortunately has caused significant land degradation and the erosion has negatively affected some of the dams and seasonal rivers on the Ranch. In addition, the trench posed quite a risk to children and animals that may fall into it and reinforced tension between the Ranch and neighbouring communities.

“
**We can live in peace
and the children will be
safe going to school.**
”

Whilst the trench had its downsides, it helped to reduce the human wildlife conflict which is a problem across many wildlife areas in Kenya. Elephants find crops, especially maize, irresistible, and crops are often grown almost to the Ranch boundary. Lions, leopards and hyaenas also leave the Ranch searching for easy pickings in the form of agricultural livestock. Encounters between wildlife and humans can be dangerous, and both have suffered injury and loss of life. These negative encounters can breed resentment in the communities with targets being the wild



The project has reprofiled and used rocks to stabilise surface water luggas and reduce erosion, this photo is of Lugga ya Nyagothia © Mike Roberts

animals themselves, as well as the ranches and conservancies that harbour and support them. All wildlife is owned by the Government of Kenya, but this does not stop the community considering a problem elephant as belonging to the ranch or conservancy it most recently came from.

In September 2022, the Ole Naishu ranch management team designed and implemented a project to remove the invasive cactus, fill in the trench and install an effective ‘elephant fence,’ which was supported with a financial contribution from the Defence Infrastructure Organisation’s (DIO’s) Overseas Stewardship Fund. First, 100 local women were employed to cut down the cactus in preparation for it to be pushed into the trench by machinery. Once the cut cactus was in the trench, the rest of the trench was filled with soil originally excavated when the trench was dug. Then, a new electrified fence was put up, specifically designed to keep in potential crop-raiding elephants. The original mesh fence was retained and restored as a way of keeping in predators that may be tempted to slip through the wires of the electric fence in search of cows, sheep and goats. Local men were employed to work on the mesh fence, receiving valuable training in fence construction that will enable them to gain employment on other fencing projects in the area.



DIO visit the new fence line project with Mike Roberts, Ole Naishu General Manager © Richard Snow

A secondary project was undertaken to clear *Lippia*, a fast spreading shrub. *Lippia*, although native to the area in small quantities, had taken over large swathes of the Ranch reducing the grasslands and hence the available grazing for animals such as zebras, impalas and buffaloes. The primary reasons for clearing the *Lippia* were to open up areas for wildlife, improve pasture, generate employment for neighbouring communities and to create firebreaks. Teams of local women were employed to clear the *Lippia* by

hand and each week they all took home a bundle of cut sticks for firewood. On completion of a five week contract they were each given a multi-fuel (firewood and charcoal) stove. These stoves reduce the amount of firewood needed for cooking in their households, thus reducing the impact on the native acacia woodlands and the time spent by women and children collecting firewood, often in areas where wildlife encounters happen.

Both the trench/fencing project and the *Lippia* clearing project have been great successes benefitting Ole Naishu, its wildlife and the neighbouring communities. The fence has significantly reduced crop-raiding in the local communities, although there is the occasional, more intelligent and determined elephant that manages to break through. Leopards also manage occasionally to get through. But hyaenas and lions can no longer get through and these were two species that the communities were particularly concerned about.

In 2022, the Environmental Impact Assessment was conducted and community members were asked about the potential impacts of the fencing project. This revealed thoughts such as “*elephants invading the farm will stop and we will be able to harvest our crop*” and “*we can live in peace and the children will be safe going to school*”. Ole Naishu is very grateful to the MOD for their financial support from the DIO’s Overseas Stewardship Fund on this project.



African buffalo are a resident species on Ole Naishu Ranch
© Mike Roberts



The fence line reduces human wildlife conflict, but some determined elephants are hard to stop © Mike Roberts

Demolition in progress © Crown

Demolition of the redundant liquid waste treatment plant at AWE Aldermaston

by Piran Borlase-Hendry and Adele Graham

Senior Environmental Specialist (Ecology & Heritage) and Senior Environmental Specialist (Projects), Atomic Weapons Establishment



A recent project at Atomic Weapons Establishment (AWE) Aldermaston demolished the redundant liquid waste treatment plant. This facilitated the release of the site for future developments, enabling AWE's continuing mission in contributing to the maintenance of the UK's nuclear deterrent. The project team included AWE as the client and principal designer, Amentum as the delivery partner, and Hughes & Salvidge as both the specialist demolition contractor and principal contractor.

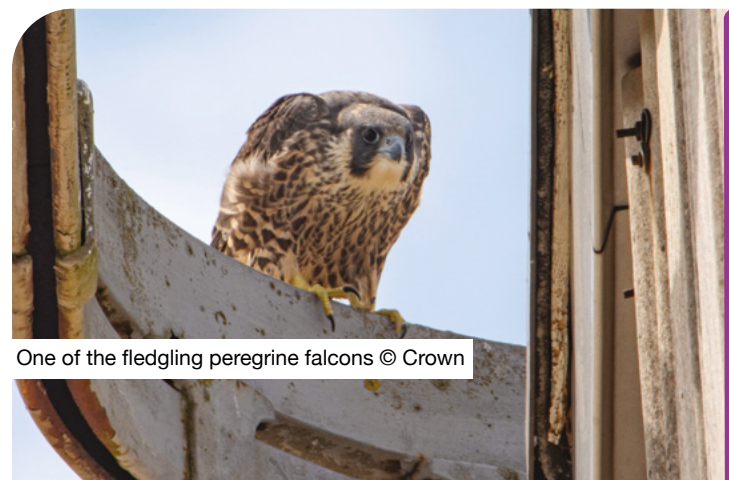
There were several successes relating to improved resource use. For example, the on-site crushing and re-use of waste concrete resulted in major benefits, reducing both the volume of material sent off site and imported to the site. Approximately £484,000 was saved from the cost of infill material, with a corresponding reduction of approximately 2,420 vehicle movements resulting in a reduced carbon footprint. In addition, a very high recycling rate was achieved with 99.98% of waste recycled and only 0.02% of waste sent to landfill.

Where possible, local suppliers were used, reducing travelling and waiting times, resulting in both a cost and carbon saving (with an estimated 500 fewer movements saving around £25,000). A silt buster was used to treat wastewater from dust suppression so it could be discharged to the on-site Sustainable Urban Drainage System, resulting in a £75,000 saving. Rainwater harvesting on-site resulted in a further estimated saving of £10,000. The machinery used by Hughes & Salvidge was

converted to use hydrotreated vegetable oil, resulting in a saving of 20,075kg of carbon emissions compared to using regular diesel.

Ecological surveys confirmed that peregrine falcons had nested on the structure during the previous year. To mitigate for this loss of nesting habitat, three artificial boxes were installed on several structures on the AWE estate. This year, a pair of peregrine falcons have used one of these to raise a pair of chicks, which fledged at the end of June 2023. Not only has this helped protect a species with a high level of legal protection, but it also led to an increased level of staff engagement as the nest location is readily visible.

An extensive environmental monitoring programme was implemented with more than 55,000 hours worked with no complaints, health and safety accidents or incidents. The project was registered under the Considerate Constructors Scheme and was also a finalist in the World Demolition Awards 2022.



One of the fledgling peregrine falcons © Crown

Restoring Otterburn Ranges' lime kiln heritage

by Jack Haw

Historic Building Advisor, Defence Infrastructure Organisation



Deteriorated condition of the lime kiln in 2021, prior to works
© Jack Haw

The Hepple Lime Kiln, on the Otterburn Ranges, dates to the early 19th century and forms part of a unique network of field kilns across Northumberland. At their peak, there were approximately 400 lime kilns across the county, many of which have since been demolished or lost.

A lime kiln was a structure used to manufacture lime by burning materials such as limestone or chalk at temperatures above 900°C. The concept of lime burning appears to have been a technology introduced in Britain by the Romans. During this period, most kilns were established to provide lime for use in the construction of adjacent buildings, usually for mortar or plaster. Lime kilns continued to be developed in Britain during the medieval period into the 18th and 19th centuries.

The Hepple Lime Kiln is an example of an early 19th century kiln which was developed as part of agricultural improvements in Britain, with kilns used to burn limestone to improve soil quality. A combination of factors led to the decline of kilns in the late 19th century, including the development of the rail network which provided greater connectivity of resources, new uses for lime, together with the construction of larger and efficient industrial lime kilns. After 1920, these smaller isolated structures became redundant and increasingly rare survivors within the landscape.

The structure on the Otterburn Ranges is built from sandstone and has an unusual and striking design with distinctive triangular chambers and canted bay sides. It sits on a highly prominent position on the edge of the ranges. As of 2021, the Hepple Lime Kiln suffered from a serious state of deterioration due to livestock damage and intrusive vegetation which led to the collapse of the east chamber. Investigations indicated that the kiln was at risk of complete collapse without immediate intervention.

The Defence Infrastructure Organisation (DIO), alongside Landmarc Support Services, with support from the Army and the Northumberland National Park Authority, commissioned a conservation led project in 2023 to restore this rare and important historic feature within the Otterburn Ranges and Northumberland. The works, funded by DIO's Conservation Stewardship Fund, included the rebuilding of the east chamber, removing vegetation and lime repointing to repair the structure and ensure its longevity.

The Hepple Lime Kiln has now been fully restored and its role in the landscape remains appreciable. It is a physical and positive reminder of the MOD's active stewardship of the historic estate.



The lime kiln following conservation and repair works in 2023
© Jack Haw

Supporting the small blue butterfly at Barry Buddon

by **Lottie Birch**

Ecologist, Defence Infrastructure Organisation



Barry Buddon Training Area © Mark Hinton

Barry Buddon Training Area in Scotland comprises 930ha of coastal plain on the Tay Estuary, between Carnoustie and Monifieth. As with many of the UK's military training areas, Barry Buddon benefits from the absence of development and intensive agriculture, helping a vast array of wildlife to flourish. Most of the training area is a Site of Special Scientific Interest and a Special Area of Conservation, and a Special Protection Area for its bird populations.

The small blue is the UK's smallest resident butterfly and is found in localised colonies, mainly in southern England. It has been in decline in the UK since the 1950s and is a priority species on the Scottish Biodiversity List. In 2019, a project was initiated on the training area to contribute to a wider biodiversity initiative in the Angus region that aims to restore populations of the small blue. The project, funded by the Defence Infrastructure Organisation's (DIO) Conservation Stewardship Fund, created a feeding corridor for the small blue across the training area by planting the butterfly's sole foodplant, kidney vetch.

With support from DIO ecologists, teams from industry partner Landmarc Support Services

(Landmarc) established kidney vetch along road and track verges to restore connectivity between breeding colonies of the small blue. Work began by breaking up soil along the edges of roads and tracks and planting kidney vetch seeds. Over the last year, the project team have focused on continuing the removal of thatch and moss from road verges to provide the growing conditions that kidney vetch requires, while monitoring the distribution of the small blue across the feeding corridors.

The project team at Barry Buddon received support from the Butterfly Conservation charity, which helped monitor the small blue population on the training area, along with sharing advice and information on the conservation of the butterfly and its habitats.

Recently a pair of small blue butterflies were identified on the training area during a visit hosted by DIO's ecology team to survey the project's progress. The visit was also attended by a representative from Species on the Edge, a conservation programme focused on reversing the decline of vulnerable species in Scotland.

The sighting of the butterfly at Barry Buddon follows years of conservation efforts by DIO ecologists and Landmarc to restore habitats for the species at the site, ensuring the work carried out was in balance with military training requirements.



Small blue butterfly © Alan Richardson

Solar projects increase biodiversity at Duke of Gloucester Barracks, Thorney Island and Rock Barracks



by Lt Col David Owen
SO1 Land Management, British Army

Army barracks are benefitting from increased energy resilience and improved biodiversity, following the delivery of three solar farms under Project Prometheus. Wave 1 has delivered solar installations at Army sites in Gloucestershire, West Sussex and Suffolk. The farms generate approximately £750,000 of energy savings every year and reduce carbon emissions by approximately 1,100t CO₂e annually – the same as taking 400 cars off the road. But that is not the full story.

At all three locations, the Prometheus Wave 1 biodiversity network funded and implemented ecological measures which have increased biodiversity, developed relationships and provided opportunities for research and community engagement. From protection of birds to grassland management, these significant impacts have come at a lower cost than the solar farms themselves, indicating how potent solar generation can be in driving social and ecological value.

Duke of Gloucester Barracks, Gloucestershire is home to a large area of high-quality Mesolithic calcareous grassland – a rare ecosystem that

could be damaged by the installation of 1.5ha of solar panels. Through consultation, robust mitigation measures placed 7ha of the airfield into an enduring improvement plan, delivered by the Defence Infrastructure Organisation (DIO) and local farmers, involving fixed point photography and annual assessment.

Wildlife protection was another priority for the project team. To ensure the installation was not delayed by the large local population of ground nesting birds, the team hung their own disused CDs from bamboo poles to successfully warn off the birds prior to construction.

Following completion of the works, an official opening took place amongst the rapidly growing rare calcareous grasses and over 1,000 newly planted trees and hedgerow plants. The event was attended by local primary school pupils and councillors, representatives of the DIO and 29 Regiment Royal Logistics Corps.

Grassland management was also a focus for the solar project at Thorney Island, West Sussex.



Rock Barrack solar farm and surrounding areas after stone curlew habitat regeneration, taken from a Gazelle helicopter © Tony Calwell



The Thorney Island Conservation Working Group meets on the shores of The Chichester Harbour Conservancy © Danny Legg

A total of 2.5ha of grassland was programmed for improvement through altered mowing, green hay spreading and the planting of 1,000 hedgerow plants. This ecological commitment led to a project delay of 12 months, ensuring that the local environment was prioritised during construction. Planting native plants has maintained the view for walkers, whilst the hectares of improved grassland meet the needs of the deer. A local primary school will also be involved in the green hay spreading – a great learning experience for the pupils.

Other community engagements offered an excellent forum for environmental management. Thorney Island borders a Site of Special Scientific Interest and site of international importance to migratory geese, while numerous active stakeholder groups share the island for leisure and conservation. From the start of construction, the project team attended local multi-stakeholder meetings, facilitated by the Station Warrant Officer and Deputy Commander 7 Air Defence Group. The possibility of additional on-site biodiversity development is a focus for Helen Butt, a DIO ecologist interested in how biodiversity may increase more than expected on a solar farm. In addition, software that accompanies solar installations illustrates the potential of renewable energy and changes mindsets of what is possible; at Thorney Island, generation data is being live streamed into the Headquarters.

Further to these measures to enhance habitats and local outreach, a bird study was commissioned investigating brent geese feeding habits, including a watching brief during construction. Again, these studies may have delayed works, but they contributed to understanding of brent geese feeding habits and added to the knowledge base of The Chichester Harbour Conservancy.

Ground nesting birds also occupy Woodbridge airfield at Rock Barracks, Suffolk including a large area of flat open ground adopted by the stone curlew as one of its main breeding grounds. Early on, the project team engaged with the Royal Society for the Protection of Birds (RSPB) employees and volunteers who monitored the curlew. Their input led to two initially favoured solar farm locations being discarded in favour of a third site recommended by the RSPB. It was also agreed with the RSPB that construction would take place over winter and curlew nests would have a 500m exclusion area around them, with 2ha of the airfield improved through buddleia and bracken removal. This led to a delay in the project by almost 12 months but forged good local relationships and built trust.

Rock Barracks will continue to be a focal point for stone curlew conservation; thanks to Prometheus Wave 1, an improved and expanding habitat promises more breeding potential for the birds. Relationships forged between Rock Barracks and the RSPB, facilitated by local councillor James Mayer, provide a basis for mutually beneficial cooperation and veteran Cliff Waller and Tim Cowan of the RSPB will hopefully have many more stone curlew chicks to count in the future.

Additional vegetation removal has subsequently been carried out, funded through the DIO's Conservation Stewardship Fund, further improving the site for ground nesting birds.

At all three Prometheus Wave 1 sites, the Army has enhanced future energy resilience, while the relationships formed in implementing these wide-ranging biodiversity measures will endure alongside the habitats that justified them.

Soldiers in training tread along the old main street through Imber towards Seagram's Farm © Harvey Mills Photography



A house through the ages – excavations at Imber village

by **Richard Osgood**

Senior Archaeologist, Defence Infrastructure Organisation

Eighty years ago, the Western Allies were planning for the greatest amphibious landing in history – D-Day. They were only too aware that, if the beach operation was successful, there would follow a series of extremely difficult urban battles and it was crucial that the troops were trained in this environment. To this end, a number of villages in Britain such as West Tofts in Norfolk, Tyneham in Dorset and Imber in Wiltshire were evacuated, and the buildings given over to preparations for what would become known as Operation Overlord.

As is well known, the villagers who left in World War II never returned and to this day the sites remain as parts of military training areas. The locations are filled with a mystery and romance which renders them very popular places for people to try to visit. Imber is used intensely for urban training on Salisbury Plain and recent endeavours to train members of the

Armed Forces of Ukraine have perhaps even heightened its importance. The training includes the requirements to 'dig in' – trench systems, observation posts and foxholes. Such requests from the military trainers are scrutinised by ecologists and archaeologists within Defence Infrastructure Organisation to ensure that this will not affect features protected by Statute. Although Imber is relatively well known – it was even mentioned in the Domesday Book of the 11th century – the information on the archaeology of the village and what remained of now demolished buildings below the soil was something of a gap in our corporate knowledge.

Therefore, in the summer of 2023 a team of archaeologists set out to examine the field to the immediate north of the oldest building in the village itself, St Giles Church. With a programme of geophysical survey and subsequent limited excavation, the aim of Wessex Archaeology,



The Church of St Giles, Imber looking over the village it has served for more than 700 years © Harvey Mills Photography

with the veterans of Operation Nightingale (which uses archaeology to assist the recovery of military personnel) and the Army Widows Association, was to gain enough data to guide future digging requests.

The Ground Penetrating Radar survey picked out the foundations of walls and structures in what is now an open field opposite the old 'Nag's Head' pub and 'Seagram's Farm'. The team decided to explore a few anomalies that this investigation picked up. One of these turned out to be the old village pond! This was cut down into the chalk bedrock and had several items that had been thrown into it on the abandonment of the village – an iron, pottery and a scythe.

More solid deposits were then encountered which corresponded with old Ordnance Survey mapping; the surrounding farmyard walls of 'Brown's Farm' and indeed the threshold to the doorway of the farmhouse itself. The team then looked to examine an area along what was once 'Church Row' leading up to the Grade I listed church building – a very desirable location for property for as long as the village existed. The archaeologists were, in part, guided by an old photograph which showed part of the building in the very early 20th century. Extraordinarily, one of the volunteers, Jennifer Wring, discovered that one of her distant relatives actually lived in this building and was in the photograph too, so for her the dig was even more personal.

This area produced lots of brick and flint wall and was tricky to decipher in terms of precise sequence, though probably from Victorian back to the 17th and 18th centuries. Pottery was helpful for dating – the team found Staffordshire wares of the 18th century and pieces of a black ‘Jackfield ware’ teapot – perhaps a gift to the householder at some point. In the final, deepest part of the excavation trench green glazed pottery of a Medieval type was found – around 14th century in date. This, combined with a number of postholes, gave a sequence from 1943 right back to the early years of the church and surrounding settlement; clearly there is much still preserved. A final find bore testimony to the end of the village – a small rifle cartridge case stamped ‘S L 43’. Made in St Louis, Missouri in 1943, illustrating an American presence in World War II and the reason the village was required.

As an archaeologist it is rare to witness the last days of a settlement with no return of villagers after a particular event, Pompeii is probably an obvious exception. Although the team did not discover the treasures of the latter, we were still able to consider the tumultuous last days of this small village and its contribution to the war effort.



Archaeologist Dave Murdie discusses his site plan with a military veteran Cecily © Harvey Mills Photography

The information recovered showed that there is still much below the surface – from the Medieval onwards. The site is probably best avoided by military digging as the troops would soon encounter very solid house foundations which have survived for centuries, and which will still endure for hundreds of years into the future.

“
Imber is used intensely for urban training on Salisbury Plain and recent endeavours to train members of the Armed Forces of Ukraine have perhaps even heightened its importance.
 ”



Volunteer Jen Wring stands outside the house in Church Row holding a photo of her relative that lived there in the early 20th century © Harvey Mills Photography

Creating B-Lines across Sennybridge Training Area

by Jonathan Davies

Rural Estate Delivery Advisor, Landmarc Support Services

One of the biggest threats to biodiversity is habitat loss, caused by changes in land used for activities such as intensive agriculture, transport infrastructure or urbanisation. Teams at Landmarc Support Services (Landmarc) and the Defence Infrastructure Organisation (DIO) have been working hard to reverse the trend in declining habitats to help protect the natural environment of the UK's Defence Training Estate.

Enhancing biodiversity across rural landscapes forms an important part of the MOD's Climate Change and Sustainability Strategic Approach, which sets out the threats posed by climate change and how Defence must work to mitigate its impact. Recently, Landmarc and DIO teams worked collaboratively to implement 'no mow' areas across the estate to increase pollinating insect populations. This simply involves not mowing designated areas of land, enabling habitats to thrive and encouraging biodiversity.

One of Landmarc and DIO's recent initiatives saw the teams contribute to the National Pollinator Strategy through the creation of 'B-Lines' at Sennybridge Training Area in Powys, Wales. B-Lines is a project from the conservation charity, Buglife, aimed at developing a series of insect pathways running across the UK, with the aim of restoring and creating wildflower-rich habitat stepping stones that link existing wildlife areas together. Sennybridge Training Area is located at the north of Bannau Brycheiniog (Brecon Beacon) National Park, and so was



B-Lines running through Sennybridge Camp
© Landmarc Support Services



Red tailed bumble bee on wildflowers at Sennybridge
© Landmarc Support Services

highlighted as a strategic link to wildlife corridors in Wales. Landmarc and DIO identified key locations across the camp to sow wildflower seeds and bee bombs, all funded through Landmarc's community fund.

Established wildflower areas are now blooming, with a noticeable difference in populations of bees and other pollinating species. There was a high level of engagement from the Sennybridge team, both through volunteering their time to plant seeds, donating seeds and taking an interest in existing habitats to identify suitable planting areas. Maintenance teams now have a greater awareness of the importance of 'no mow' areas and take care to spot where wildflower areas are developing, so that they can leave them uncut and undisturbed to flourish.

This is an enduring project that also directly supports the Action Plan for Pollinators in Wales, helping wildlife to respond to climate change by making it easier for them to move around. Landmarc strongly believes in its duty to maintain and promote the ecosystem of the Defence Training Estate's important landscape, providing both a safe and sustainable training environment.

Green energy for Duke of Gloucester Barracks

by Lt Col David Owen

SO1 Land Management, British Army

A new solar farm, the size of roughly two football pitches, has been built at Duke of Gloucester Barracks in South Cerney, home to 29 Regiment Royal Logistics Corps. Comprising more than 3,000 photovoltaic panels, the installation was funded under the British Army's Project Prometheus and delivered by the Defence Infrastructure Organisation (DIO), contracting to solar farm supplier 3ti.

The new facility was opened on 24 May by Maj Gen Richard Clements, Director of Army Basing and Infrastructure, and the event was attended by representatives of DIO, 29 Regiment Royal Logistics Corps, 3ti, local councillors and school children. Maj Gen Clements said: *"This installation represents another significant step forward to showcase the potential of renewable energy generation, in support of the Army's commitment to net zero targets. By reducing energy demand and increasing green supply, we are building a more sustainable Army estate that protects both our operational capability and the environments where our people live, work and train"*.

Duke of Gloucester Barracks is home to rare calcareous grasses which provide a rich habitat for insects and butterflies. A grassland management plan was therefore implemented as part of the project to protect biodiversity, with native trees and shrubs planted to screen the installation from its surroundings. At the official opening, Lt Col Elizabeth Sedgwick, Commanding Officer of 29 Regiment Royal Logistics Corps, welcomed the significant investment in renewable energy at Duke of Gloucester Barracks, with the new installation set to reduce environmental impact through on-site electricity generation. She also highlighted



Commanding Officer 29 Regiment Royal Logistics Corps and Director Army Basing and Infrastructure at the official opening
© Crown

the additional benefits for the barracks, including protecting and enhancing local wildlife and providing a platform for the regiment to undertake local engagement and learning.

Project Prometheus is delivering a combination of ground and roof mounted solar installations across the Army estate. The project underlines the strong commitment in Defence to invest in green energy generation and decarbonise the estate, while generating long term cost savings for the Army and resourcing the route to net zero. By the end of the financial year, four ground mounted solar farms will be operating at Army sites, with others located at the Defence School of Transport in Leconfield, Baker Barracks on Thorney Island and Rock Barracks in Suffolk. Each installation typically generates around one third of the electricity required by the host site. Together, they will create a combined £1 million in efficiency savings and reduce emissions by around 2,000 tCO₂e (tonnes of carbon dioxide equivalent).



The solar panels © Crown

Making waves with the RNRMC's Canvas Works upcycling collection



by Sarah Mann

Public Relations Account Director, Goodwork PR

One of the finished bags © RNRMC



Royal Navy veteran, Bob Field and WO1 Lee Reeves embarked on a journey into the world of eco-friendly fashion accessories, amongst colleagues, press and an array of military vessels at Portsmouth Historic Dockyard. In doing so they have chartered a course towards an entirely new fundraising stream for the Royal Navy and Royal Marines Charity (RNRMC).

In April 2023, the RNRMC, with the help of Gosport based youth charity Oarsome Chance, launched a collection of rolltop backpacks, sports bags and wallets made from decommissioned Royal Navy life rafts. The collaboration has been a clever display of innovation and sustainability that aligns seamlessly with the Royal Navy's pledge to become one of the world's greenest fleets.

Bob Field, Head of Support Services and Engagement for RNRMC, said: *"I knew from my last job in the Royal Navy that the MOD disposed of disused items in varying ways, including some going to landfill at a cost. Through this project we have managed to take difficult or impossible to recycle materials, destined for landfill, and make incredible products with new value"*.

The upcycling project, which has been four years in the making, was inspired by the Royal National Lifeboat Institution turning some of its old kit into merchandise. The RNRMC, which supports Royal Navy sailors, marines and their families, also saw an opportunity for a creative fundraising venture.

WO1 Lee Reeves said: *"There is no downside to this, the public purse is better off, the environment is happier, charities are making an income, and Oarsome Chance can get disadvantaged children involved and provide them with some purpose as well. This has been a win-win on every front, and we could not be prouder"*.

The cut and style of each item is determined by the individual raft used in fabrication, ensuring no two items are alike. The collection is handmade by the Canvas Works team at Oarsome Chance in their fully equipped studio, where students are involved with the design and construction of the products through their specialised in-house training programme. Oarsome Chance empowers young people through education, employability and physical activities.



Working with the materials © RNRMC

Conserving the north – a history of military environmentalism in Scotland

by Dr Alexander Boyd

Academic at Curtin university and former PhD researcher at Northumbria University

A three-year doctoral research project at Northumbria University examined the history of conservation on the Defence Training Estate (DTE) in Scotland, which has received little academic attention in comparison to those in England and Wales. However, the story is no less interesting, with many important contributions made to the preservation of the natural world, and our heritage. The project concentrated on Cape Wrath, Kirkcudbright and Tain.

The beginnings of military conservation practices by the MOD are generally agreed to have originated as a result of the Lord Nugent Report of the Defence Lands Committee of 1971 – 1973 (see article on p.42). In Scotland however, there had been concerted attempts to protect and conserve the environment as part of Operation Hardrock as early as 1957.

Through establishing a new military presence on the St Kilda archipelago, the MOD worked alongside archaeologists and conservation

teams to ensure the preservation of Village Bay, abandoned by its inhabitants in 1930. In what is the UK's only example of a dual UNESCO site, the sensitive building of the camp and the military road were the result of a successful partnership between the MOD and heritage groups such as the National Trust for Scotland.

Following the appointment of Lt Colonel Clayden as the first Conservation Officer in 1973, a Scottish MOD Liaison Committee was established, ensuring a strong collaborative working process with public bodies which continues to this day. Early successes for military conservation work in Scotland would appear in the pages of *Sanctuary* magazine in 1977, which featured the bombing range at West Freugh in Wigtownshire. The founding of a local Conservation Group coincided with the rediscovery of an ancient burial cairn, which with MOD support led to the excavation of the site. This provided evidence of early ploughing techniques, the protection of a relic oak woodland, an invertebrate study, the installation of bird boxes and one of



The fragile and protected dune systems of Tain Air Weapons Range © Alex Boyd



A bombing target at Cape Wrath, painted pink by local school children during the 'Defending the Past' project © Alex Boyd

the first beach clearance exercises. The group would eventually record 250 plant species, 90 ornithological species and establish that West Freugh was a site of archaeological importance dating back to 4500 BC.

The 1980s began with a concerted effort by the MOD to upskill its volunteers and conservation teams by offering a selection of organised courses which would appeal to amateurs and professionals. These were hosted at Kindrogan Field Centre in Perthshire. Identification courses for birds and trees took place alongside hands on conservation experiences. As a direct consequence of these, new conservation teams appeared at RAF Tain, Crimond in Aberdeenshire and the Outer Hebrides, among others. The year 1986 would also see a clean-up effort on Gruinard Island, the site of wartime Anthrax tests, which was subsequently declared safe for visitation four years later.

As the decade drew to a close, MOD efforts to embrace initiatives such as the 'European Year of the Natural Environment' saw the establishment of Conservation Groups at Garelochhead, the Pentland Hills Training Area and Fort George training ranges near Inverness. In 1989, the first MOD Conservation Open Day in Scotland was held at Barry Buddon, with two thirds of the site recognised as an important Site of Special Scientific Interest (SSSI) – one of 37 then located on, or adjacent to, Defence sites in Scotland.

Following the end of the Cold War, there would be significant changes across the Scottish DTE, and the beginning of a successful relationship with NatureScot (previously known as Scottish Natural Heritage). A declaration of intent was signed between NatureScot and the MOD, ensuring that the armed forces would adhere to environmental practices in 1993, which was three years ahead of the rest of the UK.

With 37 SSSI sites that lay either adjacent to, or on, Scottish MOD sites such as St Kilda, Machrihanish and the Solway Firth, one memorable initiative was the reintroduction of the sea eagle. This was a collaboration with the Royal Society for the Protection of Birds.

Held at Barry Buddon in 1997, the conference 'Scotland's Living Coastline' brought together academics, conservationists and governmental policy makers. That year saw the first underwater survey of St Kilda, a collaboration between NatureScot and the MOD, which would share the rich undersea habitats for the first time.

The last two decades have seen increased public access and moves towards a greener training estate thanks to the work of the Defence Infrastructure Organisation (DIO). The work of the late Maj Tony Crease, and all those involved with Operation AUK, a 20-year project to monitor birdlife at Cape Wrath, is perhaps one of the most celebrated of all DIO conservation projects in Scotland. This is complemented by initiatives such as Operation Nightingale, which uses archaeology to help the recovery of wounded, injured and sick service personnel and veterans at locations across the UK, including at Barry Buddon. To help combat the climate crisis, DIO has overseen the planting of 50,000 trees across the Castlelaw and Dreghorn Ranges, the construction of electronic warfare facilities and new energy efficient barrack accommodation – showing a commitment to reaching net zero targets.

While there will always be more to do, the future of conservation on the DTE in Scotland, thanks to DIO efforts, seems promising.



Tain range targets, built on stilts to minimise their footprints on the saltmarsh environment © Alex Boyd

The Korean War – searching for Britain’s forgotten war heroes

by Nicola Nash

SO3 Commemorations Caseworker, Joint Casualty & Compassionate Centre

The year 2023 marks 70 years since the armistice of the Korean War (1950 – 1953). Nearly 60,000 British troops served as part of a United Nations counter offensive in support of South Korea, against the Soviet backed North Korea. During the conflict 1,100 British personnel were killed.

Since 2017, the Joint Casualty and Compassionate Centre’s commemorations team have been working to identify the 303 British service personnel that were recorded as missing in action. This was an epic undertaking as there was no single source of reliable information about what happened to these men. A database had to be created from scratch, scouring various archives for documents relating to the circumstances of each person’s death, including

witness statements, service records, biographies and oral testimonies.

Based at the appropriately named Imjin Barracks in Gloucester, the team started the research with the Gloucestershire Regiment (nicknamed the Glosters), who are known for their heroic stand on Hill 235 during the Battle of Imjin River in April 1951. The bloodiest battle endured by the British Army since World War II, only 39 Glosters made it back to Allied lines, with over 600 captured, killed or reported missing. The records of the Glosters from April 1951 were lost and almost the entire regiment was either killed or taken prisoner. This made gathering information about the missing soldiers incredibly difficult. After the battle, it was several months before many families knew what had happened to their loved ones and in some cases, many years before death was confirmed.



The 1st Battalion Gloucestershire Regiment and C Troop, 170th Independent Mortar Battery of the 45th Field Regiment, Royal Artillery, were awarded a United States Presidential Unit Citation at the Battle of the Imjin River © Crown

The commemorations team work closely with the American Defense Prisoner of War/Missing in Action Accounting Agency, who hold a database containing the DNA of all unidentified remains found. They offered to add DNA samples of the next of kin of missing British service personnel to the database. The family trees of each missing service person are built and then attempts made to contact their families. In most cases, the next of kin is a close relative, such as a sibling or child. There is always one common theme when the relatives are spoken to – the overwhelming desire to finally have closure.

Work is also being undertaken to identify the 77 unknown British service personnel graves at the United Nations Memorial Cemetery in Busan. This involves using exhumation reports, historical documents and an overlay map which records the last known locations of each missing service person and the places where each unknown casualty was recovered.

Although this conflict is commonly known as the ‘Forgotten War’, the missing have certainly not been forgotten by the Joint Casualty and Compassionate Centre’s commemorations team.

Sea Cadets install sea hives at Port Edgar and Thrapston Boat Stations

by Jenny Howard

Director of Finance and Digital, Marine Society and Sea Cadets

In spring 2023, Sea Cadets partnered with SeaHives Ltd to install sea hives at two boating stations. Sea hives are designed to promote biodiversity in our oceans while addressing the growing environmental concerns threatening aquatic ecosystems. They are durable, reef like structures, crafted from recycled fishing nets that act as a haven for sea life. The innovative hexagonal tubular structures are designed to resemble the marine environment and encourage the natural behaviour of fish and other aquatic life. They can be anchored to the seabed or suspended in the water column.

The project sprouted from discussions in local and national forums among the cadets, called Cadet Voice, where young people decide on the issues closest to their hearts to act on. Being more environmentally responsible emerged as one of the young people's top priorities and cadets are actively taking the lead in environmental decisions and projects.

The pioneering sea hives installation took place at the Sea Cadets Port Edgar Boat Station in March 2023. Eight junior cadets from nearby Methil and Queensferry Sea Cadets units gathered together to



The inside of a sea hive © Dimitrios Lachanis

assemble and install the sea hive, under the expert guidance of David Francis, Managing Director of SeaHives Ltd. The cadets were fully engaged in the set up and installation of the sea hive, and very hands on throughout. They used drills and tools, as well as taking charge in making decisions about the sea hives. It was a new and very positive experience for the junior sea cadets.

The second installation occurred in April 2023 at Thrapston Sea Cadets Boat Station in Kettering, Northamptonshire. Four junior cadets set up their sea hive at Thrapston Lake, again with the help of David Francis. The cadets were very enthusiastic, did a great job with the assembling of the hive and asked lots of questions.

By actively supporting marine biodiversity, Sea Cadets can foster resilient ecosystems that are better equipped to withstand environmental challenges. As stewards of the sea, Sea Cadets fully embrace and enthusiastically participate to support these innovations with the aim of safeguarding our planet's most precious and vulnerable ecosystems. As junior cadet Remy (aged 11) aptly summarises "Sea cadets spend many hours enjoying the water – it is only right that we should look after our aquatic environment".



The junior cadets transporting the sea hives to the installation site © Dimitrios Lachanis

Scampton Church and RAF War Graves Heritage Centre



by Flt Lt Gary Mennell

Battle of Britain Memorial Flight Deputy Air Safety Manager, Display Wing Head Quarters



Scampton Church with RAF Aerobatics team flying overhead © Joe Bartrop

Scampton is a small Lincolnshire village, through which flows a rich vein of RAF heritage. For over 100 years the village has been closely associated with its RAF neighbour and this association is most visibly commemorated by the 107 war graves in the village church. The neatly spaced, uniform gravestones give a real sense of the scale of the sacrifice, but the community were acutely aware that that each gravestone represented a story that needed to be told and passed onto future generations. Adopting the motto “*keeping their stories alive*” the journey towards creating a unique place of remembrance began.

Under the leadership of project coordinator, Joe Bartrop, the village was galvanised into action and the drive to create a sustainable and accessible heritage centre really began to take shape. The project took a major leap forward in early 2023, when a National Lottery Heritage Grant was

secured, to make the church more suited to the modern visitor. Sympathetically adapting a 14th century church to meet the needs of today’s visitors was not an easy task, but it was a challenge the team rose to. Within months, an accessible path, accessible toilet, ground sourced heat pump and kitchen were discreetly installed in a way that complemented the church’s existing architecture.

Once a welcoming and comfortable environment had been created, the team embarked on the most important aspect of the project, keeping the stories alive and passing them onto the next generation. Building on nearly 20 years of research by Flt Lt Mennell, the stories of every serviceman buried at Scampton were committed to paper. However, it was soon clear that providing a dry historical account would not engage the primary aged children who will take the stories on into the next generation.



Flt Lt Mennell explaining the interactive screens to children from Scampton Primary School © Joe Bartrop

The team came together to discuss how best to present the truly fascinating stories that had been uncovered, each of which told the story of World War II from a unique and very personal perspective. Recognising that issues surrounding death can be frightening to young children, it was decided that each of the stories be told in the first person, with their fallen friend explaining their background, what they did in the RAF and what ultimately happened to them. The information is presented in bite sized chunks, through expandable menus, allowing the user to explore as much or as little detail as they like. This approach has not only made the system very user friendly for primary aged children but has also made it an appropriate and engaging medium for adult visitors too.

“
Scampton is now a thriving centre of remembrance, one which tells the stories of those who died generations ago in a way which is relatable to those who will carry those stories forward for generations to come.
”



Pilot Officer John Greenan

We had quite a few missions under our belt by now and we were starting to feel that we were an experienced crew. In fact, one of our crew had written home, saying he was beginning to think he might make it through after all. However, this was a big mission, we were flying to the very heart of Nazi Germany.

Tonight the target was Berlin, the most heavily defended city in the whole of Europe. The mission went well, the weather over Berlin was good, the pathfinders laid accurate marking flares and bombing results were assessed as good. As the bombers left the target area, they could still see Berlin burning from 200 miles away.

At around 2am we arrived back over Lincolnshire and descended through cloud towards Scampton and safety. But, as we broke cloud, another Lancaster appeared and the collision claimed the lives of all onboard our aircraft and three of the seven on the other. The pilot of the other aircraft survived and gave the following account:

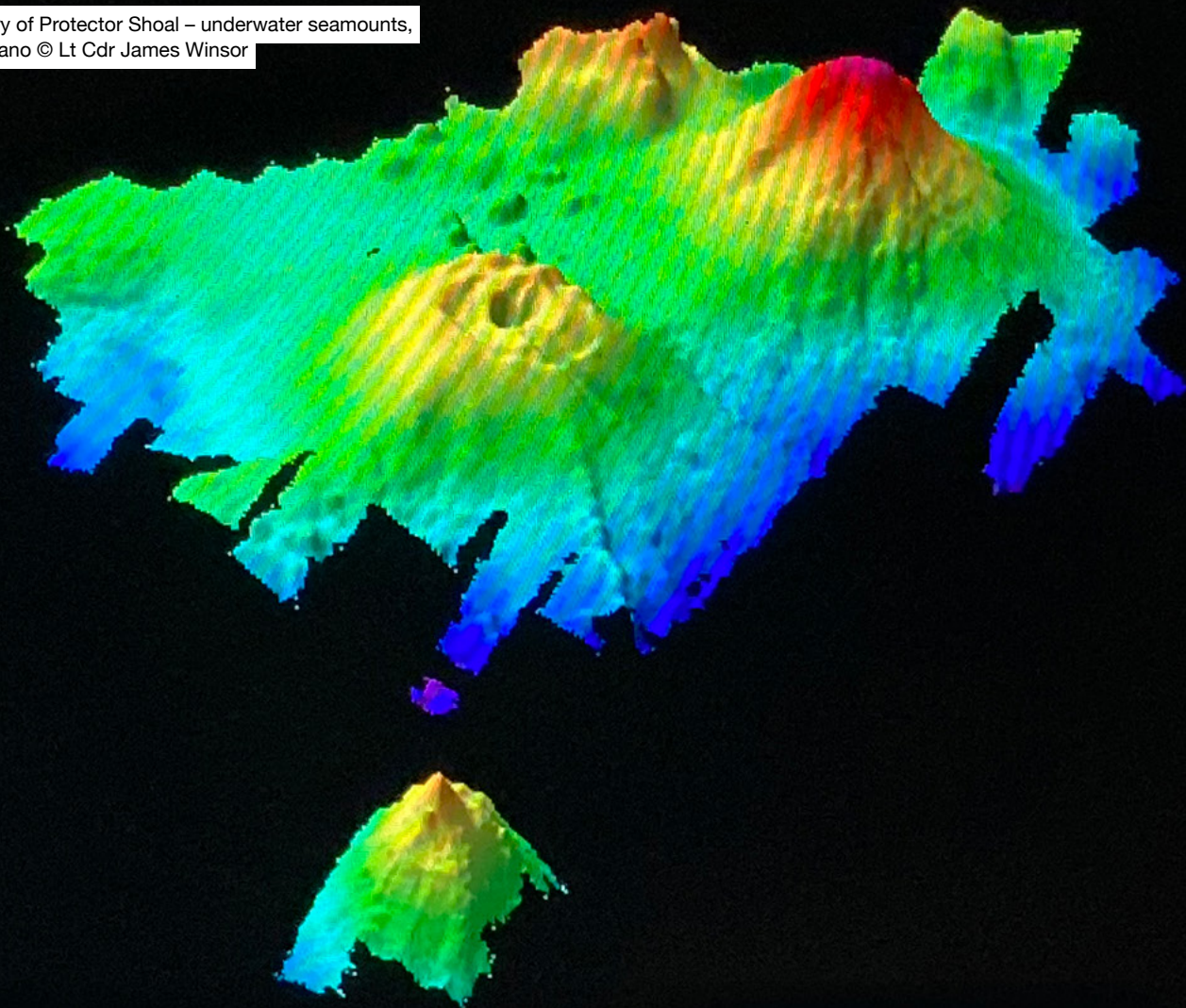
“We were in the circuit; I could see the flare path and was talking to the control tower. It was my turn to land and as I looked up there was another Lancaster breaking cloud and heading straight towards me. At that height I had no wish to put the nose down so I tried to climb over the other aircraft but did not manage it. The next thing I knew he hit me almost head-on. I don’t think he saw me and still often wonder what he was doing there. He was from Scampton and using his Gee lattice lines should have been nowhere near us. We came down at Heighington, three miles east-south-east of Lincoln and he flew on hitting a high tension pylon at Riseholme near Scampton. I remember when the aircraft hit us saying to myself well that’s your bloody lot; you won’t get out of this”.

◀ Flying Officer J F Greenan (in the centre) and his crew, photographed in front of Lancaster W4201 of No 57 Squadron at Scampton, February 1943
© Imperial War Museum



HMS PROTECTOR transiting Porquois Pas, Antarctica © Royal Navy

Multi beam imagery of Protector Shoal – underwater seamounts, caldera and a volcano © Lt Cdr James Winsor



Op AUSTRAL and the Royal Navy's Ice Patrol Ship, HMS PROTECTOR

by **Capt Milly Ingham**
Commanding Officer, HMS PROTECTOR

HMS PROTECTOR is the Royal Navy's Ice Patrol Ship. Deployed on operations for up to 334 days of the year, she remains away from the UK for long periods of time due to her flexible '3 Watch Crew' workforce. She provides an enduring sovereign presence in the UK's largest Overseas Territory, the British Antarctic Territory and the South Atlantic Overseas Territories. The ship supports the UK's commitments under the Antarctic Treaty and assists in improving the safety of navigation in the region through hydrographic survey operations. She works in close liaison with British Antarctic Survey, UK Antarctic Heritage Trust and other agencies supporting scientific and research programmes.

The Ice Patrol Ship on Operation AUSTRAL assists the British Antarctic Survey with delivery of science teams and cargo to the remotest places on the planet, furthering research and enabling climate change study. The addition of bathymetry adds to the UK Hydrographic Office Admiralty Chart areas of surveyed waters, ensures navigational safety of the growing tourist industry shipping in these pristine waters, reducing the risk of grounding and resultant maritime pollution or loss of life. Work alongside the Foreign, Commonwealth and Development Office delivers cargo to, and inspecting of, foreign nation bases to ensure strict adherence to the Antarctic Treaty.

This means PROTECTOR helps safeguard the unique ecosystems of Antarctica and extends the UK's hand of friendship to Antarctic Treaty partner nations.

During Op AUSTRAL, PROTECTOR conducted three work packages to the Antarctic region, starting in November 2022 and breaking off in early March 2023. PROTECTOR started the 2022 – 2023 season at Port Lockroy, the world's most southerly post office. This included removing snow, shoring up failing roof beams in Bransfield House and taking away waste to ensure the UK Antarctic Heritage Trust team could open the base for the season. PROTECTOR then departed for Deception Island, where the team conducted an inspection and survey of the navigation marks to assure the safety of navigation, before heading into the Weddell Sea on patrol. Although these operations involve the entire Ship's Company, much of this work is carried out by the hydrographic and meteorological sub-department onboard. They are responsible for the specific environmental enhancement work, surveying the poorly charted waters of the Antarctic Peninsula and South Atlantic Overseas Territories on behalf of the United Kingdom Hydrographic Office and British Antarctic Survey. This work furthers the United Kingdom Hydrographic Office Admiralty charting to prevent accidents at sea for the growing cruise ship industry presence, and aids academic and scientific research in the region.

Visiting the Falklands for a crew rotation in the 40th anniversary year of the South Atlantic conflict, the wrecks of HMS ANTELOPE, HMS ARDENT and HMS COVENTRY were surveyed. The team did some detective work to hunt for Foxtrot-4 Landing Craft Utility which was sunk by enemy action. Whilst the craft was not located, the work reduces the future search area considerably. PROTECTOR sailed south once again to conduct a sovereignty patrol of the South Sandwich Islands, during which scientific personnel and stores from the British Antarctic Survey disembarked at Signy Island, to open up the base for the season. At Zavodovski Island to the east, the team commenced three days of scientific survey operations on the flanks of Protector Shoal, named after a previous Protector, and rising up from the deep as a series of seamounts and submerged caldera.

Completing the patrol loop and arriving in South Georgia, the team conducted close inshore surveys and offshore transit corridor surveys

Crew member from HMS PROTECTOR establishing a remote tide gauge for tidal observations in Antarctica © Royal Navy



to improve the charting for the cruise industry. This meant Christmas day was spent at sea but included a visit to Ernest Shackleton's grave and that of an Argentinean submariner.

After a second crew rotation in the Falklands, PROTECTOR returned to Antarctica with stores for the British Antarctic Survey and the UK Antarctic Heritage Trust. The ship repositioned off Damoy and landed the trust's field site team, along with a large amount of equipment. An overnight tidal observations camp was landed on Horseshoe Island, whilst the ship identified areas which are potentially attractive sites for cruise ships to visit, to survey in future seasons, and then sailed south for Rothera via Lemaire Channel.

The ship came alongside Rothera and delivered cargo containers, bulk stores and jet fuel allowing for essential flight movements for the coming months. The team conducted ecological surveys of Antarctic Specially Protected Area sites on Emperor and Avian Islands and visited Brabant Island whilst making preparations for clean-up operations at a former British Army base camp.

PROTECTOR returned to the Falklands after completing the work packages for 2022 – 2023. She then proceeded back to the UK for repairs, training and preparations for the next season of her ongoing mission to support the UK's commitments under the Antarctic Treaty in her role as the Royal Navy's Ice Patrol Ship.

Roman military archaeology discovered at Fingringhoe

by Peter Chamberlain

Training Safety Marshall, Fingringhoe Ranges

The Colne Estuary, with its saltmarshes, tidal mudflats, migratory wildfowl, breeding waders and abundance of wildlife, is located just outside of Colchester in Essex. Within its Site of Special Scientific Interest sits Fingringhoe Range complex, on land that was acquired by the War Office between 1889 – 1899. As a planning condition of the construction of two new firing ranges, archaeological excavation works were required. This is the story of the amazing findings.

It has been suggested that Fingringhoe may have acted as a harbour and supply base for Colchester (Camulodunum), Roman Britain's first capital, the UK's oldest recorded town, especially during the early military phase of Roman settlement. The Essex coastline was the site of an extensive salt production industry in the Roman period and Maldon salt is still produced less than 15 miles to the south-west.

On the ground at what will be Wick Marsh 1, a 600m electronic target range, a large ring ditch was found. Inside of which held a Roman watchtower and most likely an artillery placement. The latter indicates military occupation of the site.

A unit of the Roman army was stationed at the Fingringhoe Ranges probably soon after the Roman invasion of AD 43. They built a watchtower, which would have been one of several in the area designed to watch over and protect the mouth of the estuary, and to provide a line of communication, presumably to the army stationed at the fortress at Camulodunum.

The soldiers were armed with a ballista (a missile launcher designed to hurl javelins, powered by torsion derived from twisted cordage), which could fire missiles fitted with iron boltheads at the enemy. The remains of this weapon were found within/close to the tower. The missiles (bolt heads) were found at a distance, showing that they had been fired, whether in practice or in times of danger.

At some point the tower was repurposed, which could suggest reuse of the tower in the later



Late Iron Age/Roman 'Red Hill' (debris associated with salt production) pre-excitation © Colchester Archaeological Trust

Roman period, perhaps still as a watchtower or signal tower, at a time when Saxon shore forts were being built along the eastern and southern coasts. This is supported by some later 3rd to 4th century pottery also being recovered.

The discovery of the Roman military watchtower, with ballista catapult located on the range floor between the 600m and 500m firing points of what is now the Wick Marsh 1 Range, could be taken as evidence for Fingringhoe Range complex having the oldest military ranges in the UK. Challenge made!



Barbed and tanged flint arrowhead (early Bronze Age 2500 – 1200 BC) © Colchester Archaeological Trust





A skilled tradesperson welding
© Babcock International Group

Closing the skills gap to build the next generation of warships



by **Natasha Allan**

Head of Sustainability, Marine, Babcock International

Creating a safe and secure world has never been more important. From submarines beneath the waves to secure communications in space, Babcock ensures the services are equipped to fulfil their mission by delivering engineering, support and critical systems.

To deliver the next generation of warships, such as five Type 31 Frigates for the Royal Navy, Babcock needed to think more laterally about how to meet the challenge of growing the workforce and closing skills gaps at its Rosyth facility in Scotland.

Babcock, in partnership with trade unions and local community partners, developed a new type of role – the Production Support Operative, to support tradespeople on the job, whilst providing a new opportunity that offers people a route to employment. The programme aimed to help successful applicants develop in the workplace, gain qualifications and potentially become skilled tradespeople themselves.

In April 2022, Babcock started recruiting for the role, with an intake of 14. In the first year, this expanded to over 150 through the employment of 10 additional cohorts.

Social value sits at the heart of the Production Support Operative programme. It is helping to tackle economic inequality and drive social mobility by targeting recruitment from areas of higher

deprivation to attract candidates looking for an alternative route to employment, skills development and future career opportunities. A bespoke 3 – 5 week initial training programme is delivered by Fife College and further supplemented with on the job learning from Babcock.

The programme is helping to drive equal opportunities by reducing barriers to employment and supporting people not actively in work. A two-week pre-employment programme was also launched and led by Fife Council and Kingdom Works (Kingdom Housing Association), funded through Local Area Covid Economic Recovery.

Additionally, recruitment practices are more inclusive with the removal of educational restrictions and provision of neurodiverse support. There are early indications that the programme could address gender balance by attracting women into the workplace. Having achieved some success already, there is an ambition to increase this further through future cohorts. The creation of a capability pathway to a future apprenticeship also provides further opportunities to progress.

Smart solutions

Throughout the entire lifecycle of the programme, from the initial business case to embedding in the business, the team challenged traditional ways of working to create a smart solution that mitigates resource risks and creates high-quality

job opportunities. From recruitment to training, everything has been specifically designed to enable the delivery of the Production Support Operative programme.

Initially, the trade unions helped with obtaining buy-in from the workforce for the new Production Support Operative position. Fife Council supported with targeting recruitment in areas of deprivation for the pilot and the creation of the bespoke pre-employment programme – the first of its kind within Scotland and 100% successful to date.

Fife College provided 3 – 5 weeks of bespoke capability development for every cohort, including general health and safety training and specific skills such as grinding and hot work.

A dedicated Babcock project team with representatives from production, learning and development, HR departments and trade unions designed a fair and inclusive resourcing and assessment process. This included the management of over-subscribed applications (500+) in the second intake. The induction programme and evidence log of competency ensures the Production Support Operatives in each cohort are comfortable and confident in the workplace and have a visible Babcock sponsor.

Sustainable outcomes

Production Support Operative is an innovative, bespoke programme with a firm focus on contribution to the local economy by providing high-quality job opportunities that support growth and sustainability in the Defence sector.

This proven and flexible capability development programme has been designed to meet business requirements and the Type 31 Programme. It is

helping to mitigate the tradesperson skills shortage by applying a 70/30 application of resource challenge, where appropriate to do so (30% Production Support Operative) and continues to grow and meet vacancy numbers on time, in full, when required.

The programme has strengthened community involvement via Fife Council and with the creation of the pre-employment programme, which included local training solutions by Kingdom Works, Exp-Learn and Opportunity Fife. The 100% successful pre-employment programme has been proven to help people in unemployment. During the first Production Support Operative cohort, nine out of 14 candidates were offered jobs at Babcock and the remaining five were offered alternative employment.

The employment of women in Production Support Operative roles has shown early improvement in gender balance in industrial roles. The aim is to continue this trend by promoting these success stories to encourage more women to apply in the future.

The launch of a new Babcock trainee welder programme provides a capability pathway for unemployed/unskilled candidates to enter the workplace, gain experience and obtain a future welding apprenticeship.

From the initial pilot, and at various points throughout the programme with each new intake of recruits, Babcock collected and shared best practice with all stakeholders. The Production Support Operative programme is now being replicated in other parts of Babcock in the UK – demonstrating a relentless commitment to push at what is possible, striving for excellence in service of a safe and secure world.



Production Support Operatives learning on the job © Babcock International Group



Female Production Support Operatives © Babcock International Group

Woolmer Forest – ensuring a future for natterjack toads

by Rob Free

Weald Reserves Manager, Amphibian and Reptile Conservation

The natterjack toad is one of Britain's rarest amphibian species, inhabiting coastal sand dunes and lowland heaths. It experienced significant losses of population and range over the 20th century and today occupies just 60 known sites in Britain. Declines were most severe in the south of England and by the mid-1970s only one heathland site in southern England remained – Woolmer Forest in Hampshire.

Natterjack toads hung on at Woolmer due to the site's preservation as military training land. They hunt actively at night and require very short vegetation that they can traverse easily – this is offered by the mown range floors. Parts of Woolmer being wet also provides suitable ephemeral breeding ponds, which dry in late summer so tend to have fewer aquatic predators of natterjack tadpoles.



John Buckley (left) and Jack Harper collecting Woolmer tadpoles © ARC



Natterjack toads hung on at Woolmer due to the site's preservation as military training land.



Amphibian and Reptile Conservation's (ARC) work at Woolmer as the Defence Infrastructure Organisation's conservation partner dates to around 1971, when the natterjack toads were at a low ebb. Targeted management of the seasonal breeding ponds and the terrestrial habitat has improved breeding success significantly, enabling numbers to climb to healthy levels. Currently around a hundred spawn strings are regularly laid each year. However, this was not the case at neighbouring Blackmoor, a 41ha privately-owned heathland, where the natterjacks died out in the 1970s as the habitat became unsuitable.

In 2010, ARC took on the management of Blackmoor. The habitat was restored and the scene set for a long-awaited return of natterjack toads. But the intervening woodland and A325 road were a significant barrier to natural colonisation. A translocation plan was made



Adult natterjack toad © ARC

and a licence obtained from Natural England. In June 2023, following a good Woolmer spawning season, around 1,000 natterjack tadpoles were carefully transported to their new home. They were released into specially created ponds using lessons learned from the best of the restored Woolmer ponds. Some of these tadpoles successfully developed into toadlets and it is hoped they will go on to found a new population.

This work is part of a four-year reintroduction programme, funded by the South Downs National Park which includes population monitoring so ARC can evaluate the success of the reintroduction, and also monitor the crucial Woolmer donor population to ensure that it continues to thrive. Blackmoor is the sixth site in England to receive such translocations of natterjacks from Woolmer – the training area is of great significance to the species' future.



An adult male toad, emitting a reaping call at the breeding pool, which can be heard up to a mile away © ARC



HRH The Princess Royal watching a pianist of the Royal Marines Band Service © Crown

Former prison at HMS Nelson repurposed for military musicians

by Maj Brendan Wood

SO2 Infra Del London and Joint Bands School, Defence Estates Optimisation



The former military prison at HMS Nelson, Portsmouth has undergone extensive refurbishment to provide a shared practice space for the musicians of the Royal Marines and the Royal Corps of Army Music, as part of a £3.35 billion investment programme in Defence infrastructure. The Defence Estate Optimisation portfolio is the single biggest estates change programme within Defence, which includes a significant number of Army infrastructure projects, including the 'Joint Bands School' at Portsmouth.

The project has involved developing and refurbishing Gibraltar Block at HMS Nelson, which was constructed in 1834 as a Military Detention Quarters (prison). The block consisted of solid brick walls in the Flemish bond pattern, with seven bays over two storeys providing 28 cells. In c1890 the building was extended to 18 bays over three storeys, providing 108 cells. Bomb damage in c1940 then resulted in the loss of the north-east wall and five damaged bays, with repairs carried out around 1950.

Some 40 years later, in 1995, the Royal Marines School of Music began to use the building. A basic refurbishment took place at that time to provide modern toilet facilities and cadets' quarters in other areas of the building, which were previously used as washrooms and a sick bay. Army musicians arrived in 2021, having historically trained in the now disposed of Kneller Hall in London. The new facility at HMS Nelson presented an opportunity to co-locate with the Royal Marines, enabling efficiencies to be made in the sharing of facilities.

The prison cell blocks are ideal for the musicians to use as individual and small ensemble practice rooms because the thick walls absorb sound. The cells were also fitted with acoustic panelling sound proofing to comply with regulations, create a more satisfying musical appreciation and enable the musicians to practise in a noise compliant area.

To retain historical context, each cell has retained the original hammock hooks, floor and ceiling vents. New extraction, heating, flooring and full

decoration brought them up to a much more comfortable standard. The heavy nail-studded wooden doors have been stripped of layers of paint and coated in a fire-resistant clear varnish to preserve the aesthetic heritage of the building. Original locks and external handles have been retained, however internal handles had to be fitted to allow the musicians to leave the cells of their own free will!

Inside, the building has two sets of iron stairs with octagonal newels up to cantilevered cast iron galleries, running around the first and second floors, with three open wells on each floor and cross-braced balustrades. Old suicide netting manufactured by Navy riggers covers each space in between the floors to protect against falls, which were professionally cleaned and refitted, again retaining heritage value.

Original lock from cell door © Brendan Wood



During the refurbishment, the building often revealed its history in surprising ways. A stash of contraband was found concealed behind the window of one cell, including cigarettes, books and metal polish. Graffiti dating back to 1864 was also uncovered, along with the name of a sailor from HMS Warrior scratched into the brickwork. These discoveries will be exhibited behind a clear screen to protect and preserve the heritage.

Unfortunately, the repairs undertaken after the bomb damage in the 1940s did not stand the test of time. During the project, both the internal and external walls were discovered to be bowing – the internal wall ties had corroded, and over time the two walls had separated. Repair work involved reintroducing lateral Helibar restraints to the newly constructed external wall panels. On the external walls, damaged bricks were replaced and embedded with historic lime/sand mortar. Using these sensitive construction methods, the contractor was able to repair the bowing walls while matching the original historic design intent for the building.

The Joint Bands School project was delivered collaboratively between the Army and the Royal Navy. It was driven by a project management team from Army HQ Defence Estate Optimisation and the Defence Infrastructure Organisation, with support from Navy Infrastructure and contracted partners KBS, who in turn contracted to Concept for construction. Significant input from Historic England and the local authority ensured that the potential of the Grade II listed building was realised throughout the design and construction, with aspects of its heritage preserved.



Internal view from top floor © Brendan Wood



HRH The Princess Royal at a music practice cell, escorted by Maj Green with a member of the Royal Marines Band Service
© Crown

Military musicians from the Royal Navy and Army can now share exemplar facilities and professors in this distinctive and atmospheric setting. The bespoke benefits of co-location include developing knowledge through collaboration and improving overall morale, thanks to provision of modernised, comfortable fit for purpose surroundings, which still retain the historical flavour of the original building. Importantly, the historical value of the site has been preserved through sympathetically incorporating heritage considerations into the design and refurbishment.

“
The prison cell blocks are ideal for the musicians to use as individual and small ensemble practice rooms because the thick walls absorb sound.
”



Repairs to external cell walls
© Brendan Wood

British Army Training Support Unit Belize's cave clean-up

by WO2 Matthew Bailey

Deputy Training Safety Officer, Defence Infrastructure Organisation

In February 2023, British Army Training Support Unit Belize's Range Control team escorted Richard Osgood, Richard Snow and Oliver Howells of the Defence Infrastructure Organisation (DIO) Technical Services environmental audit team to a cave system on the Manatee Training Area in Belize. On this visit to the cave, various pieces of Mayan pottery, freshwater snails and some animal bones were found, which dated back some 2,000 years. It was also noticed that there was a lot of litter around the cave system, which had been left behind by tourists and hunters. The cave system was once a site for tourists visiting from cruise ships.

A few days after the trip, Range Control organised a cave clean-up day. Range Control contacted the National Institute of Culture and History, Mayan Forest Corridor Trust, Belize Mayan Forest Trust and the Wildlife Conservation Society to gain permission to conduct the clean-up. Fast forward to 5 April 2023 and after nearly two months of work to obtain all the relevant paperwork, Range Control conducted a recce to the cave system. The team were accompanied by the National Institute of Culture and History and Wildlife Conservation Society rangers.

Many of the service personnel at British Army Training Support Unit Belize were keen to help with the clean-up trip. Upon arriving at the cave entrance on the Manatee Training Area, personnel were split into groups, each with two DIO range team trackers attached to them for the trek up to the cave, mainly for safety reasons. The trek was slow, so the trackers pointed out medicinal trees and plants and explained what the soldiers should not touch.

Once at the cave, the National Institute of Culture and History conducted a brief history lesson on the Mayas that once inhabited caves and temples around Belize. They also explained about the lineage of surnames used some 2,000 plus years ago. Once the brief was complete, the clean-up of litter in and around the cave commenced. The group then divided into teams and a cave walk was conducted. Additionally, a survival stand took place at the same time for the other group. At approximately 1400hrs, the day's activities were concluded. Everyone trekked back to the vehicles, returning to Price Barracks. All service personnel that took part in the clean-up were very pleased with everything they had accomplished and look forward to future activities.

The team during the day © Cpl R Williams





The awards team © Crown

Army energy saving competition drives down emissions and bills

by Lt Col John Bradbury
SO1 Energy, Army Directorate of Basing and Infrastructure

A competition to encourage Army personnel to reduce their energy consumption has saved 11,000 tonnes of carbon emissions – equivalent to taking 4,000 cars off the road. Launched in April 2022, the Energy Efficiency Incentivisation Award ran until March 2023 and was managed by the Army Sustainability Efficiency and Exploitation team, within the Directorate of Basing and Infrastructure.

In the face of increasing energy costs on the Army estate, the Sustainability Efficiency and Exploitation team were challenged to come up with a scheme that would encourage personnel to focus on what they can do to conserve energy, reduce carbon emissions and save money. The aim of the award was, therefore, to incentivise units to use less energy by rewarding good behaviour, offering data driven, performance based financial rewards to make an impact at Army level.

Around 100 entries were received from large stations, small units, Regulars and Reserves – a significant take up in the competition’s first year. Army units vary widely in terms of size, role and deployments – as does the age and condition of the barracks in which they live, work and train – so each unit was compared against their own previous energy consumption to ensure a fair baseline.

The ability to monitor energy consumption also varies across units: some are fitted with accurate smart meters, while others have meters that result in estimated readings following an operator

visit. To resolve this imbalance, all units were invited to submit a two-page report summarising what measures they had taken to reduce energy consumption. Quantitative and qualitative measures were then combined to produce the overall rankings, with entries judged by a panel of Army and Defence Infrastructure Organisation (DIO) representatives.

Results were announced in July 2023, following analysis of data from all participants. Collectively, the award entrants reduced energy consumption by 7% compared to the baseline year. The energy saved was worth £3.7 million – enough to pay for 500 soldiers to exercise on Salisbury Plain Training Area for two weeks. This resulted in a carbon emission reduction equivalent to taking 4,000 cars off the road for a year.

Awards were presented to first, second and third placed entries, along with multiple gold, silver and bronze awards. These were accompanied by an additional Local Infrastructure Improvement Fund grant, ranging from £5,000 to £25,000.



First prize went to Leuchars Station – a busy Army and RAF site with an active airfield that inevitably has a high energy use. Personnel were encouraged to ensure that building faults, such as faulty heating, windows and doors, were reported quickly to the helpdesk, supported by constant liaison with DIO and Mitie to ensure swift rectification of energy loss faults. The Station Quartermaster has also been working on optimisation of the Station’s built assets: moving units into centralised working locations enabled closure and change of the operational need of unused assets, allowing services to be disconnected. In addition, close working between the DIO, the delivery partner, HESTIA and Major Project teams is enabling the Quartermaster and the Station Safety Health Environment Advisor to channel future build designs and refurbishments towards net or near net zero consumption.

Lt Col Ben Parkyn, Commanding Officer, The Royal Scots Dragoon Guards and Head of Establishment, Leuchars Station said *“The possibility of additional funding, if selected for good practice, certainly did have a positive effect with all on Station. It is a whole team effort from the youngest private soldier up to the Head of Establishment. My advice is do not dismiss anything, challenge policy and investigate any idea to reduce usage”*.



1st place Leuchars Station use their winnings to replace the original 1936 front doors at Station HQ © Susan Budd

Leuchars are using their additional Local Infrastructure Improvement Fund grant to refurbish Single Living Accommodation kitchen areas, undertake a small refurbishment in the Station Gymnasium and replace the original front doors on Station Headquarters, reducing heat loss from the building while retaining its aesthetical character. The Army is the largest energy consumer on the MOD estate. Lowering the Army’s energy consumption and emissions through this initiative has therefore had a significant impact on the MOD’s contribution to its Greening Government Commitments target for direct and indirect emissions. In addition, there has been a demonstrable change in energy efficiency behaviour, both individually and collectively, across a significant part of the Army.

Following a successful first year, the competition is running again in 2023/24. Renamed the ‘Utility Savings Challenge’ – it has been expanded to monitor water use as well as energy consumption. The scheme received endorsement from the Chief of General Staff too: *“Saving energy and water is the right thing to do. I would like to see an uptake in entries to the Utility Savings Challenge competition, while also pushing those who entered last year to go further. I am setting the Army a leadership challenge to make a real difference”*.

The energy saving habit has been increasingly adopted by Army society. This initiative will remain in place, to ensure it stays that way.



A soldier turning down the heating to save energy © Army

Overseas Hit Parade – the Environmental Management and Assessment team’s top picks

by **Richard Snow et al.**

Senior Environmental Adviser, Defence Infrastructure Organisation

Military training is often conducted in places away from people, in immense landscapes that offer challenging terrain and extreme conditions that test and form our soldiers, sailors and airmen. These wild landscapes are often marked by past civilisations and called home by the world’s most iconic plant and animal species. The Environmental Management and Assessment team sits within Technical Services in the Defence Infrastructure Organisation (DIO). Our role is to ensure that Defence activity is legally compliant and integrated with each site’s environmental sensitivity. The team supports the UK Test Estate, the UK and Overseas Training Estate and Overseas Estate and administers the DIO Overseas Stewardship Fund, supporting environmental projects. The team are pleased to share with you some of their favourite sites and project work.

Richard Snow, Senior Environmental Adviser (Test, Training Estate and Overseas)

I first set foot in Kenya on 8 October 2006, to look at the environmental impact of extending the footprint of the training area on Mpala Ranch. Since then, I have been privileged to continue to support the British Army Training Unit Kenya to establish new training areas across Laikipia and develop a new barracks in Nanyuki, called Nyati (Swahili for Buffalo).

Kenya is often referred to as the cradle of humanity – evidence of cultural sites across our training areas go back to the Early Stone Age, with burial mounds, pottery, obsidian sherds and cave rock art being just some of the features encountered. The training areas are located within the counties of Laikipia and Samburu. Their extensive habitats range from rivers and



Lion at Ol Doinyo Lemboro Ranch, Kenya © Richard Snow



Elephant at Ole Naishu Ranch, Kenya © Richard Snow

wetlands, acacia grassland mosaics, to the rocky escarpments and forested Afromontane ecosystem on the higher altitudes. Archers Post Training Area, to the east of Samburu National Park, supports 1,135 faunal species of which 981 are invertebrates, with a further 350 species of bird. While the Laikipia training areas support dense assemblages of mammals and record over 300 species of birds. My hit parade is topped with the rumble of an elephant and call of a lion at night – but never overlook the small things, I just love seeing dung beetles in action!

Kayleigh Maguire, Environmental Adviser (Test Estate, UK and Overseas Training Estate – Canada, Belize and Kenya)

What do elephants, turtles, penguins and monkeys have in common? They can all be found on the MOD training estate! Having just started with the team it has come as a real surprise to find out how diverse the estate is. Our training areas are shared with many other users and routinely foreign military personnel, cadets and the police can be found using our ranges. This further strengthens our partnerships around the world and aligns with the United Nations Sustainable Development Goal to deliver peace, justice and strong institutions.

The quality of our estate exists due to the sustained efforts of tailored management, strong partnerships and respectful users. Our commitment to sustainable management and

climate adaptability will see us maintain and enhance the training estate for the benefit of all our military users, local communities and native species going forward.

Looking ahead, many of our challenges are being driven by climate change. Wildfires, invasive non-native species, local conflicts over resources and increasingly erratic and severe weather events are occurring around the world now, and our estate is not shielded from this. To help future proof the estate we are proactively delivering climate risk assessments to increase our resilience and to adapt and withstand the impacts.



Grévy's zebra at Mpala Ranch, Kenya © Richard Snow

David Reynolds, Environmental Adviser (Cyprus)

Established under the 1960 Treaty of Establishment, Akrotiri in Cyprus is known as the Western Sovereign Base Area, covering 123km². Dhekelia is the Eastern Sovereign Base Area and is 131km² in size. Over 40% of the land cover is designated as a Special Area of Conservation (Habitat & Fauna), Special Areas of Conservation (Birds) and Ramsar (Wetlands). My current role looks to ensure that maintenance, development control and military training complies with MOD policy and the Sovereign Base Area Ordnances. In Cyprus, the MOD is taking significant steps to deliver seismic compliance and modernise its estate through projects such as Project Apollo.

Invasive non-native species are a pressing global environmental challenge. In the Sovereign Base Areas, we have targeted stewardship funding over the past 10 years to remove and manage *Acacia saligna*, an Australian shrub, which dominates and shades out the native vegetation from our designated habitats. Thanks to Darwin-sponsored pollinator research, we are starting to fully understand the benefits for wildlife that the regeneration of the native habitat is delivering for a wide range of species (with more to be revealed in future *Sanctuary* magazines).

The very first signs of permanent settlement on Cyprus are around 8,200 BC. Through DIO Overseas Stewardship Funding we have worked with the University of Leicester to research, map and assess the condition of the known archaeological sites. We now have an up to date record to inform our management and development control.

The killing of songbirds has been in sharp focus across the Mediterranean and with a zero tolerance policy, tackling illegal wildlife crime has been a priority for the Sovereign Base Area. The Working Group changed the law and removed irrigation and trapping equipment. DIO Overseas Stewardship Funding purchased a drone and cameras and with the Sovereign Base Area Police Community Action Team on the frontline arresting bird trappers, illegal activity has been reduced by 98.5% since 2016 – 2017. It was estimated in 2016 that trapping was killing 800,000 per year, this combined action spearheaded by the police has saved millions of birds! (See *Sanctuary* 48, 2019).



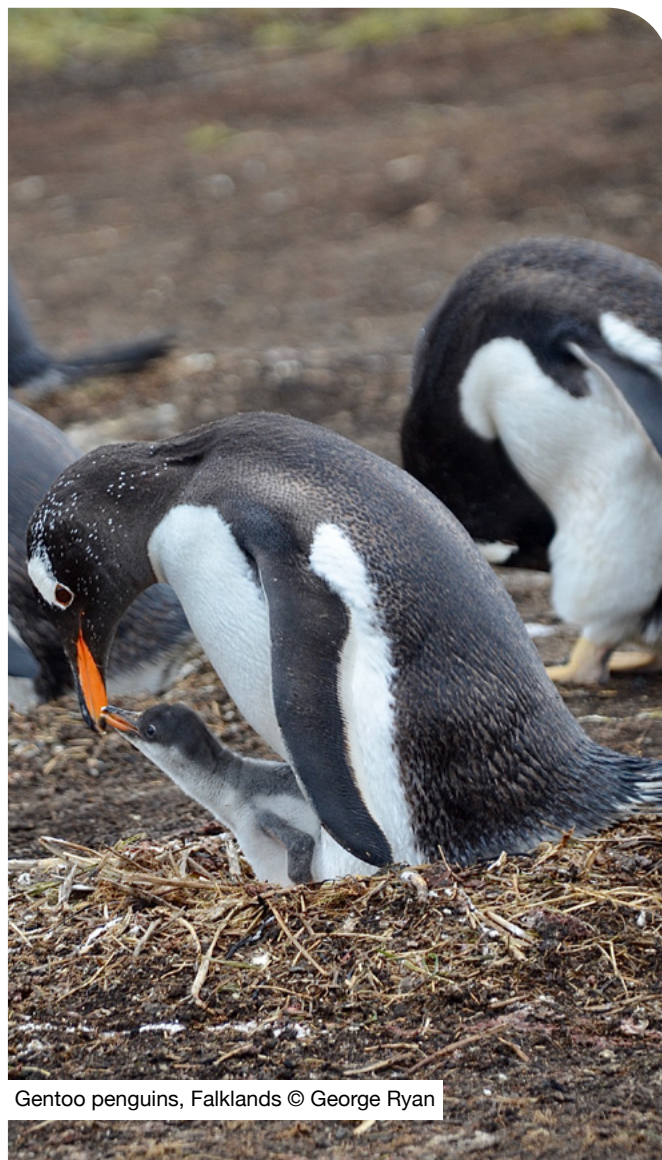
Roman cut tombs at Akrotiri, Cyprus © Richard Snow



Akrotiri coastline, Cyprus © Richard Snow



Bracket fungi within the beech forest Sennelager, Germany © Richard Snow



Gentoo penguins, Falklands © George Ryan

Duncan Savage, Environmental Adviser (Nepal, Brunei, Gibraltar, Ascension, Falklands and Germany)

I am in the privileged position of supporting an incredibly diverse overseas estate. This includes Nepal’s offices in the shadow of the Himalaya; training areas hidden within Brunei’s ancient rainforest; and the self-sufficiency and resilience of Ascension Island and the Falkland Islands. Not to mention the experience of meeting wild penguins on the latter’s white sandy beaches; and with Gibraltar being a great place to observe the spring and autumn bird migrations.

NATO Forward Holding Base Sennelager is an oasis amidst the populous and industrial state of North Rhine-Westfalia, Germany. The combination of heathland and forest is not dissimilar to my home in the New Forest, however Sennelager is so densely packed with history and ecology that it has been shaped by, and is dependent on, its use as a military training area. Every visit comes with almost guaranteed red deer stag sightings and evidence

of wild boar rooting. In the autumn, impressive displays of fungi occupy every niche. The best place to view the training area is of course from Haustenbeck Tower, although as with much of the estate it has a complex history, having been built by prisoners of World War II.

Sennelager has its challenges as we operate within a highly populous part of a sovereign nation with mature environmental laws, requiring significant stakeholder engagement. I have been fortunate to oversee projects funded by DIO’s Overseas Stewardship Fund, which help demonstrate to our neighbours the positive impacts of military training. These projects have established new native broadleaf woodland to replace large areas of coniferous woodland devastated by the spruce bark beetle, and pond creation to support amphibian populations such as natterjack toad.

We hope you have enjoyed reading about some of the sites our team cover overseas – we have enjoyed sharing them with you.

How to set up a MOD Conservation Group

by **Aleasha Caple**

Environmental Engagement team, Defence Infrastructure Organisation

What are Conservation Groups?

Conservation Groups are stakeholder liaison forums that are mandatory under JSP 850 on sites with statutory designations. They have been delivering conservation, across the UK and overseas, for nearly five decades. The first MOD Conservation Group formed at Longmoor/Borden in 1974, with numerous other sites quickly following suit.

There are many types of Conservation Groups, which conduct a wide range of tasks across the MOD estate. Activities include habitat creation, species surveying, heritage preservation, maintaining public access routes and creating community wellbeing gardens, to name just a few!

Memberships vary across Conservation Groups too, with some smaller groups run by dedicated on-site staff, to larger groups that include external subject matter experts.

The Environmental Engagement team supports UK and overseas MOD Conservation Groups, providing guidance and, where possible, financial assistance.

Steps to setting up a Conservation Group

The first step is to get the approval and support of the site's Head of Establishment.

The second is to nominate a Chairperson. This role is ultimately the responsibility of the Head of Establishment, but they may delegate the task to another member of staff if they so wish, whilst maintaining an overview.

Thirdly, a Secretary should be nominated. They will be required to organise meetings, keep minutes, and answer day-to-day enquiries. In some groups, the Chairperson and Secretary roles are fulfilled by the same person.

Once the above tasks have been completed, you should contact the Environmental Engagement team (DIO-ConservationGroups@mod.gov.uk) who will then be able to assist. A Conservation Group Chairperson's pack will be sent to your nominated Chairperson/Secretary, which provides detailed information, and further tailored assistance provided.

What happens next?

There is a necessity for a Conservation Group to hold a minimum of two minuted meetings per year. These review the work undertaken over the previous six months and look to approve the work planned for the next six months.

When the Conservation Group is up and running, it is an important task to carry out surveys to establish what species of flora and fauna are present and which merit specific attention.

An invitation to the meetings, as well as minutes, should be sent out to all Conservation Group members, as well as to the Environmental Engagement team.

To find out more about what Conservation Groups get up to you can read the 'Around the Regions' section of this, and previous *Sanctuary* magazines.



Around the Regions with the Conservation Groups

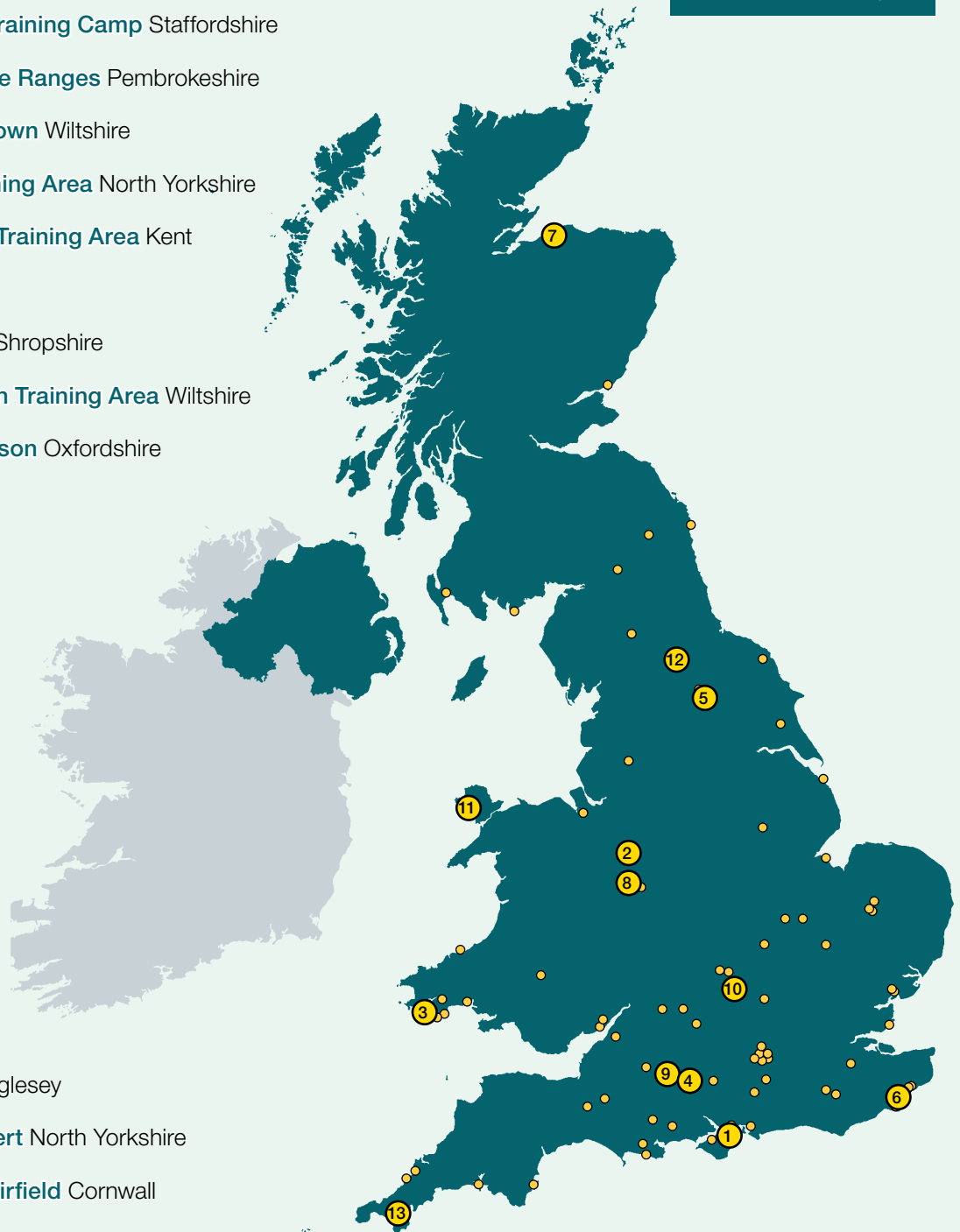
There are over 65 active MOD Conservation Groups. The following section provides an update on some of their activities over the past year.

- 1 Spotlight on... DM Gosport Hampshire
- 2 Swynnerton Training Camp Staffordshire
- 3 Pembrokeshire Ranges Pembrokeshire
- 4 Dstl Porton Down Wiltshire
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KEY: UK MAP

- 1 Featured regional Conservation Group
- Other regional Conservation Group

- 11 RAF Valley Anglesey
- 12 Foxglove Covert North Yorkshire
- 13 Predannack Airfield Cornwall



Spotlight on...

DM Gosport, Hampshire



Grizzled skipper © Tim Collingwood

by **Raffaele Turk**

Compliance Manager Environment, DM Gosport

Defence Munitions (DM) Gosport is a 208ha Defence Equipment and Support explosives munitions depot located in southern Hampshire, within the highly urbanised town of Gosport. The site is an upper tier Major Accident Control Regulations establishment, due to the holdings of explosives.

DM Gosport is situated on the western shore of Portsmouth harbour. The harbour is an area of high ecological value due to the vast intertidal mud flats and rare salt marsh and marine vegetation present; designated as a Site of Special Scientific Interest, Special Protection Area and Ramsar site. An inlet from the harbour extends onto DM Gosport and forms a small water body known as Frater Lake, providing an excellent example of old English coastline. It supports an interesting range of biodiversity, including the slender grey heron, illusive kingfisher, rare native oyster and vibrant golden samphire salt marsh flower.

The majority of the DM Gosport site is designated as a Site of Importance to Nature Conservation (SINC) due to the expanses of important florally diverse grasslands, including lowland meadow and coastal grassland, with other areas of woodland, scrub, salt marsh and open water. Red Listed species present include the great crested

newt, curlew, skylark, grizzled skipper, various bat species, plus many more, as well as the substantially rare and localised, large gold case-bearer moth.

The large gold case-bearer moth is a former Biodiversity Action Plan species that is considered rare in the British Isles, only occurring in parts of southern England. This species produces a



Large gold case-bearer larval casing © Tim Collingwood

durable woven silk larval casing and utilises the foodplant, dyer's greenweed, a vulnerable species of grassland herb present on-site. Both the moth and herb species were thought to have been lost, however, growths of dyer's greenweed discovered in 2019 showed evidence of the moth.

“ The population of large gold case-bearer moth may be one of the largest in the UK. ”

In 2023, the populations of both species were the largest identified in many years, prompting a visit from a Butterfly Conservation moth expert who detailed that the population of large gold case-bearer moth at DM Gosport may be one of the largest in the UK. The management of the area will be amended to ensure maximum benefit to the species, whilst mitigating the development of thick grass swards and scrub vegetation onto the grassland area. A monitoring regime will also be developed across the spring and summer months to capture valuable data on species distribution and abundance. The protection of this species will now be a priority focus of DM Gosport conservation.

Another site priority has been the habitat remediation of the site designated the 'butterfly glades' that form part of the overall site SINC designation. The habitat supports an interesting range of biodiversity, including the Red Listed butterfly species grizzled skipper, small heath and white-letter hairstreak. An ongoing project was initiated in 2019 to restore 8ha of priority grassland from years of scrub invasion. The ground was also mulched and scarified to help restore the underlying seedbank packed with various floral species now present, including grassland indicators birds-foot trefoil, meadow vetchling, common knapweed and oxeye daisy. Local Member of Parliament for Gosport, Dame Caroline Dinenage, has had a keen interest in the site ecology as it is a major biodiversity stronghold for the local area, including many interesting and vital pollinators. She visited the site in early July to view the progress and the current state of the habitat.

In 2021, a butterfly surveying programme was developed with Butterfly Conservation to monitor the species found on-site, the 2023 schedule started in April and concluded in October. Species distribution and abundance was similar to last year's results, with the meadow brown being the most abundant on-site at any singular time. Two of the three Red Listed species were identified. Other evidence of caterpillar activity suggested the presence of the third, but unfortunately it was not formally recorded on the wing. The largest change in abundance was from the small copper with a significant increase from 2022. In 2024, there are plans to expand the survey transect routes to capture butterfly activity in other areas of the site, as anecdotal sightings have identified substantial numbers in some grassland locations.

2024 will also see a major development to the whole site grounds maintenance regime, with a more holistic approach to grassland management. This will include management sympathetic to conservation and wildlife value in areas where that is possible, whilst satisfying the stringent legislative requirements that come with explosives storage and processing. This will be in addition to woodland creation for net zero, the implementation of a formal woodland management plan for existing woodland parcels and smaller initiatives, such as wildflower meadow creation, bat boxes, invertebrate habitat creation and more.



Dyer's greenweed in flower with larval casing © Raffaele Turk

Swynnerton Training Camp, Staffordshire

by **David Jackson**

Committee Member,
Butterfly Conservation, West Midlands Branch

Habitat loss through over intensification of farming, pesticides, and changes in land use, are the main factors resulting in long-term trends showing that 80% of UK butterfly species have declined since the 1970s. The West Midlands Branch of Butterfly Conservation carry out recording, surveys and hold work parties to maintain suitable habitats to sustain our rare, scarce and increasingly isolated species.

Ten years ago, a work colleague asked the author of this article to verify an image of a butterfly which had been photographed at the BIFFA waste disposal site at Cold Meece. It was a grizzled skipper, and if confirmed this would constitute the last known location for this species in the county. On visiting the site, a short rabbit grazed gully was located near to BIFFA's formidable fence and within five minutes three grizzled skippers were found.

However, the habitat on the other side of the fence looked even better for butterflies. Surely there must be grizzleds over there? After contacting John Bryan, a local entomologist, the adjoining land was identified as Swynnerton Training Camp. John obtained permission to survey inside the camp and a visit was arranged.

In May 2023, a further site visit was organised with Joe Hamer, an ecologist from the Defence Infrastructure Organisation (DIO). We were warmly welcomed by Maj (Ret'd) Jim Salisbury and his staff, who allowed us into the camp for another survey.

The habitat had not changed much since our previous visits, still having a scrubland mosaic with open gravelly ground throughout the rear part of the site. John had previously recorded maximum numbers of up to 30 grizzled skippers and two dozen dingy skippers, amongst a host of other butterflies. Wild strawberry and bird's-foot trefoil are still growing in decent quantities, with other caterpillar feeding and adult nectar sources. We were pleased to find a couple of



Grizzled skipper at Swynnerton Training Camp © David Jackson

grizzled skippers and dingy skippers, as well as small heath and common blues, attesting to the importance of this type of bare ground and disturbed habitat.

Butterfly Conservation West Midlands are now drafting a management plan to be agreed with the DIO and Maj (Ret'd) Salisbury. We also hope to access the site over a week's period during next spring's grizzled skipper flight period, with the intention of carrying out a full mapping survey over four main discrete areas within the camp. It is hoped that an ongoing partnership can be formed to work together to support the grizzled skippers' continued survival at its only known colony in Staffordshire – a winged-win for the butterflies and its guardians.



Dingy skipper at Swynnerton Training Camp © David Jackson



Pembrokeshire Ranges, Pembrokeshire

by **Bob Haycock**

Naturalist and Ornithologist, Pembrokeshire Ranges Conservation Group

Ringed plover
adult and chick
© Annie Haycock

The extensive shoreline of Frainslake Sands, Castlemartin Range, regularly attracts small flocks of migrating and overwintering shorebirds including oystercatcher, curlew, grey plover, sanderling, dunlin and ringed plover. Large numbers of gulls also rest here at low tide. Although some permitted recreational users, for example fishermen and surfers who have attended safety briefings, can access the beach, the area is generally undisturbed and thus provides a quiet sanctuary for these birds.

Among the smaller waders, ringed plovers are very much associated with coastal beaches where they traditionally nest. Unfortunately, the popularity of public beaches for humans and associated recreational pressures means that there are considerably fewer undisturbed places where they can breed successfully. This has contributed to a decline in the numbers of this Birds of Conservation Concern Red List species.

Ringed plovers have bred at Castlemartin in the past. Until 2009, a pair (possibly involving the same adult birds) nested for several years, not on a beach but on open rocky ground above the cliffs near Wind Bay. This was their last known breeding location in Pembrokeshire.

In the summer of 2022, fisherman and keen birder Ian Sefton observed an adult ringed plover performing an injury-feigning display on Frainslake Sands. Its behaviour suggested that young, which are nidifugous (meaning they leave the nest shortly after hatching), might have been nearby. However, breeding was not confirmed.

In May 2023, two pairs of ringed plovers seemed to be establishing breeding territories on the upper shore. After some careful searching, a small,

shallow scrape with three tiny cryptically marked eggs was eventually found in open sand between pebbles. A couple of weeks later, a second nest with four eggs was also confirmed.

Castlemartin Ranger, Lynne Houlston quickly erected out of bounds signs on the upper shore. Information about the plovers and a need to avoid their breeding zone was provided at range safety briefings for those seeking permitted beach access. This was reinforced with on-site information at the main beach access point.

Further observations suggested that one of the nests had failed (possibly due to predation) but small fluffy chicks were eventually seen in June running around between open areas and large pebble hiding places. It is thought that at least two young ringed plovers reached an independent flying stage, making this the first confirmed breeding success of this species anywhere in Pembrokeshire for more than 10 years. Hopefully they will continue to breed and prosper here in the future.



Frainslake Sands, a ringed plover nesting area © Annie Haycock

Dstl Porton Down, Wiltshire

by Sarah Atkinson

Ecological Officer, Dstl Porton Down

Defence Science and Technology Laboratory (Dstl) Porton Down has long been recognised as an excellent site for butterflies; 44 species have been recorded on-site, which equates to 78% of the British list. This includes several rarities such as chalk hill blue, brown hairstreak and Duke of Burgundy. One of these rarities, the pearl-boarded fritillary, had not been seen for a number of years. This was until several were recorded last year and again this summer, bringing hope for this species on-site.

A silver-spotted skipper survey was undertaken this summer with the support of volunteers from Wiltshire Butterfly Conservation Group. The core area of four acres had 83 butterflies counted and a six-acre area that had not been surveyed recently found 64, despite deteriorating weather conditions. This is promising for the on-site population; another survey is planned for next year, when hopefully more suitable weather conditions will ensure a more comprehensive and accurate survey of the population.

A five-year project has recently completed, partly using funding from the Defence Infrastructure Organisation's Conservation Stewardship Fund, opening up areas of the Isle of Wight Woodland for the Duke of Burgundy. The aim of the project

was to connect two populations in the woodland, through rides and clearings, as well as helping to increase primrose which is their larval food plant. A survey was undertaken in the spring to see if the primroses were colonising the new areas, and many were found, which should benefit the Duke of Burgundy population. Continued monitoring of the butterflies and primroses will be undertaken to see how this area improves over time.

Another rare butterfly, the marsh fritillary, has historically been found in two core areas on-site. However, this year a large patch of their larval webs were discovered at another location. Next year, as a consequence, a full survey of this area will be undertaken to further investigate the extent of the expanding population.

Additionally, this year a project was set up to look at how butterflies and other pollinator species can be enhanced. Different habitats, from long grassy margins to various pollinator areas that have been sown, were surveyed. Results from this will show which mixes are most beneficial, with the potential to increase these habitats across the site. All this work, along with plans to increase habitats, highlights the commitment that Dstl has to biodiversity across the site.



Silver-spotted skipper © Dstl



Strensall Training Area, North Yorkshire

by Sarah White
Excursion Secretary, Yorkshire Naturalists' Union

In July 2022, Strensall Military Training Area hosted a meeting of the Yorkshire Naturalists' Union, an association of amateur and professional naturalists covering a wide range of aspects of natural history. Strensall is well known for the importance of its lowland heathland and aquatic habitats, so the meeting attracted a large group of 43 members, with specialisms including flowering plants, plant galls, moths, spiders, dragonflies and birds. Some chose to record in small groups and others joined guided walks led by local specialists.

Moth traps were set out the previous evening and 205 species were recorded, including 14 newly recorded, bringing the site's moth species total to an impressive 623. Strensall is the only known English site for the dark bordered beauty, which is more commonly active during the daytime, and at least 12 individuals were seen during the meeting.

Despite the hot, dry weather, 35 species of spider and four harvestmen were found, including six spiders new to the site. Beetles included four-banded longhorn, black snail-hunter, a pair of glow worms and green tiger beetle.

Those on the dragonfly and damselfly guided walk saw 13 species, and the ponds also proved particularly rich botanically with notable species including lesser skullcap, marsh St John's-wort, water-purslane, tubular water-dropwort, floating club-rush, bog pimpinell and lesser water-plantain. Marsh gentian is one of the specialities of the wetter areas of heathland and flowers in the late summer, however one very early plant was found

in flower. Another of the plant specialities is a tiny fern called pillwort, a scarce species which grows on the margin of acidic ponds. While none were seen during our visit, a later survey by the Freshwater Habitats Trust and Yorkshire Fern Group confirmed that it is still present at two of the ponds.

Birds at Strensall are surveyed in detail annually, so observations on the day represented only a snapshot of the overall picture. Notable sightings were singing tree pipits, at least two families of stonechats, a pair of woodlark and a pair of spotted flycatchers.

A final highlight for a lucky few was an excellent view of an adder in the car park just as we were packing up to leave. This was an extremely enjoyable and productive visit, with important records created across a range of taxa, underlining the conservation value of the training area.



Female dark bordered beauty © Peter Mayhew

Cinque Ports Training Area, Kent

by **Colin Welch**

Co-Director, Research Resource Archaeology

At 1000hrs on 29 July 1944, the sound of a Hawker Tempest EJ532 diving towards the ground was heard. It is sobering that as the aircraft emerged from low cloud F/Sgt Anthony Drew of the RAF's 56 Squadron was seen to be bailing out. As he leapt clear he would have been travelling at around 360 miles per hour (the same speed as his aircraft) and with no time for his parachute to deploy, he sadly lost his life. He fell 15 metres from his aircraft onto land in the Cinque Ports Training Area (part of the Defence Training Estate South East) at Acrise, in Kent, just outside a large walled garden that originally served the nearby Acrise Place.

A reference in the National Archives and a painstaking study led Research Resource Archaeology to discover the crash site. This formed part of a wider high-profile remit to research the V-weapons offensive (a particular set of autonomous long range weaponry designed for strategic bombing during World War II) that Nazi Germany led against Britain during 1944 – 1945. F/Sgt Drew had been flying as part of an anti-diver (V1 flying-bomb) patrol.

Following permission from Maj Rick Beven (Senior Training Officer), the assistance of Richard Goslett (Landmarc Support Services' Rural Manager at Cinque Ports), and the granting of the relevant licence to excavate, work began in 2016. The excavation discovered wreckage down to 3.15m, in a context that revealed the aircraft had been inverted at 20° from vertical. The conclusion was the pilot lost oxygen supply at altitude, causing the accident.

The story made a deep impression on all involved, including F/Sgt Drew's relatives, for whom this was a momentous discovery.

Once the excavation formal report had been submitted to Kent County Council's Historic Environment Officer, Maj Beven and Richard Goslett's team began work to create The F/Sgt Drew Memorial Orchard in the walled garden at Cinque Ports, consisting of heritage Kentish apple and nut trees. An inauguration ceremony led by the Rev Scoble took place at 1100hrs on 29 July 2022, exactly 78 years and one hour after the wartime



Mrs Toni Knight, one of F/Sgt Drew's relatives, attending the ceremony © Colin Welch



F/Sgt Anthony Drew, 56 Squadron RAF © Family of F/Sgt Drew (used by kind permission)

crash. It was attended by members of F/Sgt Drew's family; 56 Squadron RAF; Royal Artillery; the RAF Air Training Squadrons from Deal, Dover and Folkestone; Research Resource Archaeology and members of the public. The 'Last Post' was played by a bugler from the Band of the Royal Air Force Regiment.

39 Engineer Regiment (Kinloss), Moray

by **Capt Alexandra Bidie**

2IC 65 Field Support Squadron,
39 Engineer Regiment Conservation Group

39 Engineer Regiment Conservation Group at Kinloss is very much in its formative stages. The regimental Quartermaster, Lt Col Horrocks arrived in early 2023 with an enthusiasm for conservation and a determination to increase the regiment's 'eco credentials'. He has been the driving force behind building what was a semi-official eco group into a formalised organisation within the MOD Conservation Group guidelines.

As an opening event, which was also aimed at recruiting members to the group, the regiment committed to participating in the Global Charge, 1st (UK) Division's sustainability event. Its focus was on inspiring people, both military and civilian, to drive positive change in how the natural environment is viewed and managed. Organised by Capt Bidie, 39's contribution was to engage in a clean of the beach that backs onto camp, simultaneously collecting data for the Marine Conservation Society.

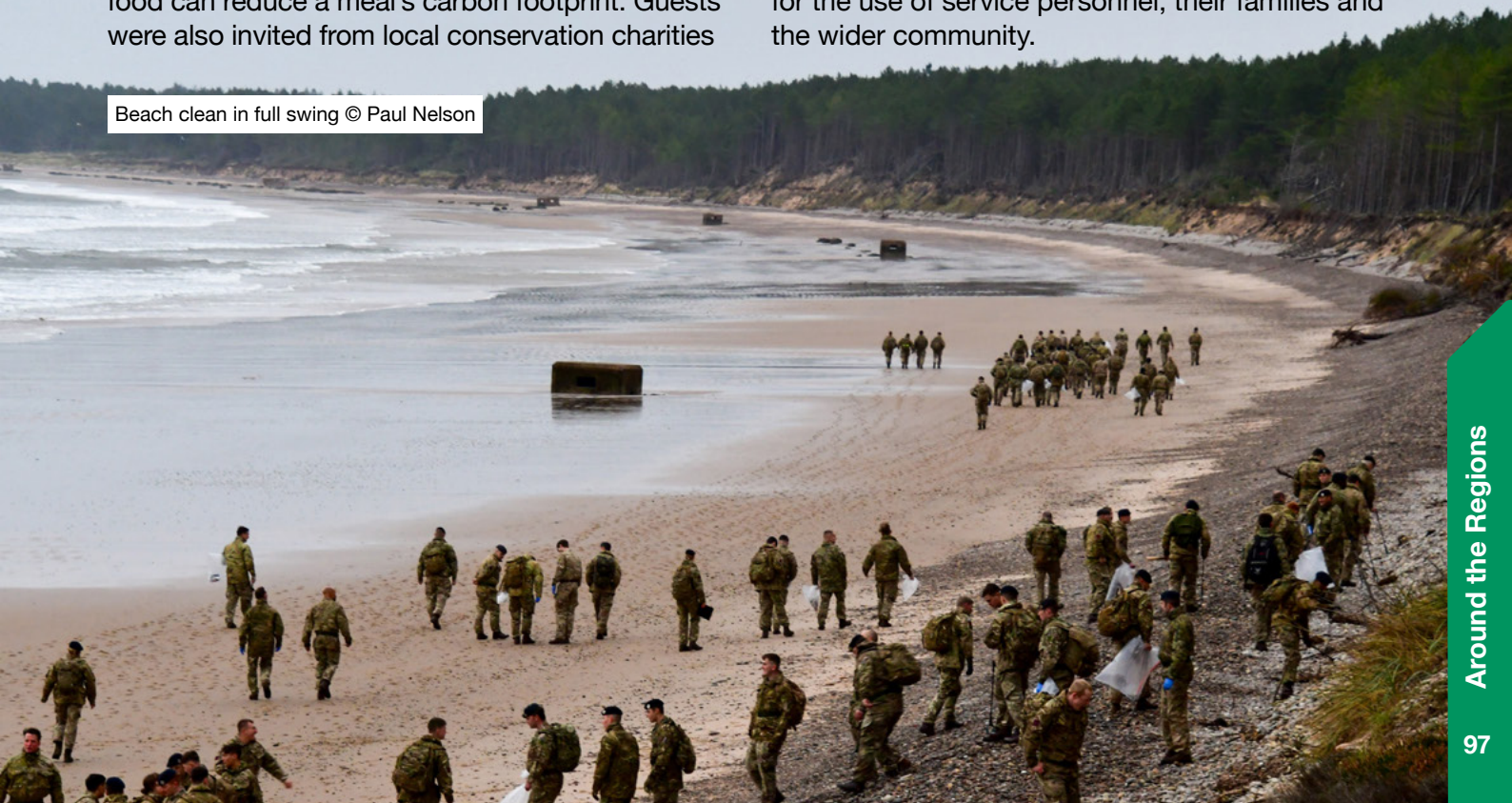
This was followed by the junior ranks' cookhouse delivering a sustainable lunch focused on local dishes (haggis, neeps, tatties et al.) using local produce, demonstrating how eating locally sourced food can reduce a meal's carbon footprint. Guests were also invited from local conservation charities

to supply information on the natural environment around camp and their work. By all accounts, the event was a success, with service personnel requesting regular beach cleans become part of the battle rhythm.

The objectives going forward are ambitious and wide reaching, but with high levels of motivation from the top down it is definitely achievable. Initially, the group is seeking to establish a strong membership base from across the five squadrons within the regiment. The remit of these individuals will be to drive conservation focused activity within their respective squadrons and feed into the wider regimental activity, with both ideas and workforce. The long-term aim is to engage with local charities and stakeholders, sharing knowledge and resources. Utilising subject matter experts will ensure that the camp and the regiment's operations are sustainable and positively impact the broad number of ecosystems that it encompasses and interacts with.

Key targets for the next 12 months are to have a comprehensive survey of the wildlife that inhabit the site carried out. Thus allowing for the identification of areas within camp to be set aside as protected habitats, with the aspiration of building a forest school/nature trail around these for the use of service personnel, their families and the wider community.

Beach clean in full swing © Paul Nelson



RAF Cosford, Shropshire

by **FS Nicola Tait**

Chair, Project Greenspaces, RAF Cosford

RAF Cosford's conservation area has been managed by the conservation club for many years. The area is a small but important part of the local nature highway as a priority habitat of deciduous woodland. Over time, the area had become overgrown and was no longer accessible for personnel to discover and enjoy the changing landscape, nesting birds, small mammals and various pond life.

Emerging from COVID-19 restrictions gave new impetus to revive the conservation club, engage new members and restore the conservation area. Project Greenspaces was formed in 2021, aligning other environmentally aware activities to encourage wider participation. The last 12 months have seen a variety of events, including a Wild Work Day led by Shropshire Wildlife Trust. Participants of whole force personnel were taught woodland management techniques to help RAF Cosford manage the site independently. Since then, more personnel have come forward to volunteer and continue this work.

The conservation area has also been available for trainees to use for team building and community projects. Working groups have maintained pathways, protected and repaired habitats, and introduced more wildflowers to support local pollinators. The work is ongoing and offers the Station a local alternative to traditional methods of team building, whilst also raising awareness of wider environmental issues.

A milestone was achieved this year when signage was finally introduced. The design, build and installation of the signs was completed by Station personnel and students, further raising the profile of this precious site. Personnel are now greeted with a welcome sign as they enter the pathways and are invited to connect with nature through mindfulness and gratitude practices dotted around the site. Open to staff, trainees and families, many personnel include the pathways into their breaks and walks around the Station.

New wildlife cameras were recently installed as an exciting opportunity to observe and monitor wildlife. The footage will provide useful insights to guide further development that will benefit the needs of the inhabitants, from small pond creatures up to large nesting raptors.

A new shed is now in position, safely storing bee equipment and tools ready for a variety of seasonal activities for the years ahead.

Gains made over the last couple of years would not have been possible without support from the Station, Nuffield Trust and the Defence Infrastructure Organisation. With their help, Project Greenspaces can continue to offer more opportunities to connect with nature, build community and take positive action.



Signage explaining how to connect with your surroundings mindfully © FS Nicola Tait



New hive donated to the bee club © FS Nicola Tait



Using military skills to the maximum – a RAF Chinook helicopter lowers bags of chalk onto the Bulford Kiwi hill figure as part of the restoration of the monument
© Harvey Mills Photography

Salisbury Plain Training Area, Wiltshire

by **Iain Perkins**

Environmental Engagement and Conservation Officer, Defence Infrastructure Organisation

This year's report focuses on our wider partnerships who, alongside our Conservation Group volunteers, provide an equally important role in the management of Salisbury Plain Training Area (SPTA). There were visits from the Dipterists Society who walked along the Nine Mile River, the Conchological Society, the annual entomological field meeting with guests from around the country and the shrill carder hunt by Bumblebee Conservation Trust. All these events provided valuable data. Later in the year, attention was turned to the conservation of the Bulford Kiwi.

Headquarters SPTA wishes to thank all those mentioned along with the many others whose efforts help to keep the training area such an important place ecologically, historically and culturally to work, live and enjoy.

Conchological Society visit

Ena montana is a rare land snail known in England as the bulin, or mountain bulin. Its British conservation status has recently been assessed as 'Near Threatened' and so the society initiated a re-survey of all the known British sites, SPTA being one. The aim is to see how many of these sites remain viable for the species and to try to identify the causes for any local extinctions.

Out of the 11 species recorded on the day, they were delighted to find *E. montana* and *M. obscura*

which were readily found on trees. Adults and juveniles of both species were plentiful on the trunks of young beech and one adult *E. montana* was found on a smooth-barked conifer trunk, as well as on the occasional sycamore. About 40 adult *E. montana* were found in total, with one estimated to be about 5m up a beech. It seemed that the snails were ascending right up into the tree canopy.

Bulford Kiwi receives its annual makeover

A historically significant monument has had its annual re-chalking after a collective effort from UK Defence, the New Zealand High Commission and volunteers. The 'Bulford Kiwi' was carved in the chalk on Beacon Hill above Bulford at the end of World War I, by soldiers from the New Zealand Expeditionary Force, who were waiting to return home (see *Sanctuary* 47, 2018).

The Defence Infrastructure Organisation partnered with the New Zealand High Commission, local Conservation Groups, Landmarc Support Services and volunteers from the 3rd (UK) Division Signal Regiment and Operation Nightingale to restore the impressive carving. As part of the project to ensure the historic significance of the Kiwi is preserved, an RAF Chinook helicopter flew over the site and dropped 10 tonnes of chalk, which was then raked into place by volunteers. A Māori Waiata song and Gurkha Kukuri dance were performed which was enjoyed by all.

Bicester Garrison, Oxfordshire

by Gary Beckett

Conservation Officer, Bicester Garrison

Piddington Training Area is a 30ha site that has an excellent amount of terrestrial habitat, providing outstanding habitat for nature. The area is used for training by the Defence Explosive Ordnance Disposal, Munitions and Search Training Regiment and local cadet forces. It contains old brick buildings that were operationally used by Auxiliary Territorial Services in the 1940s.

In February 2023, the team designed and created six freshwater habitat ponds on the area. This will increase biodiversity value as the land sits within the county's red zone of highly suitable habitat for great crested newts. A requirement of the District Licencing Scheme agreement is for the ponds to be inspected at six-month intervals and tested for clean water. The recent inspection had all positive results.

Actively managing the area will ensure this training facility continues to support Oxfordshire's local nature recovery strategy. There is a good mix of habitats across the site, with rough grassland meadows and blackthorn scrub, which will require a management strategy for future years

to rejuvenate the area. Areas of scrub have been cleared creating wildlife corridors and improving training access routes. More blackthorn is recommended to be coppiced and thinned to create better scrub communities and age structure which is recognised as very important for nature conservation.

There is a hazel plantation which requires thinning to encourage new growth and the potential of hazel resources. Volunteer workdays are planned for the continuation of improving the area. By engaging with volunteer groups, more scrub can be cleared allowing the area to be sensibly managed to help with nature recovery.

The work is demanding but the benefits bring a sense of achievement and pride over what has been achieved, contributing to volunteers' good health and wellbeing. Future management will be critical to ensure the site continues to improve the value of its terrestrial habitat, by Bicester Garrison Conservation Group. Creating a habitat to be proud of now, and in the future, will help the site's biodiversity and ensure the site has a rightful place in the bigger scheme of the wilder landscape.

A recent addition is the introduction of a beehive apiary which will hopefully become an integral part in the pollination process. A potential partnership with the local Wildlife Trust and funding by partners such as the Trust for Oxfordshire's Environment are fundamental to the continuation of the excellent work already undertaken across the garrison.



Brown hairstreak feeding on bramble © Gary Beckett



Freshwater pond within hazel plantation © Gary Beckett

RAF Valley, Anglesey

by **Sgt Mark Jones**
Station Sustainability Champion, RAF Valley

Anglesey, or Ynys Mon, is rich in both history and Welsh culture and is possessed of a rich abundance of flora and fauna. It is little wonder that the 12th century monk Gerald of Wales described Anglesey as 'Mon Mam Cymru,' or the 'Mother of Wales.'

RAF Valley personnel are exposed to all this abundance of riches and the airfield's personnel do all they can to make the most of it during their tour. RAF Valley is bounded on one side by a significant conservation area; teeming with rare birds, insects and plant life, and to the west it abuts the Irish Sea. This brings RAF Valley personnel into daily contact with wildlife, ranging from rare adders basking on the taxiways in summer, to the booming call of rare bitterns in the reedbeds in the spring, and increasingly, the spectre of exotic creatures washed up on the beaches.

RAF Valley also has its own Conservation Advisor, Gem Simmons, from the British Divers Marine Life Rescue and her help and advice is proving increasingly useful. RAF Valley personnel recently got involved in the repatriation of a critically endangered Kemp's ridley sea turtle; the most critically endangered species of sea turtle in the world, that had drifted to Welsh waters from the Gulf of Mexico. Volunteers from RAF Valley provided a safe RAF Police escort for the sea turtle from where it was recovering in Anglesey Sea Zoo to RAF Valley, and then onwards to Texas in the very early hours of 29 – 30 July 2023.

Coverage of this one act went viral in both the UK and USA. This has made RAF Valley many friends in conservation and allowed it to spread its capillaries of influence. One individual at RAF Valley who has been foremost in embracing our commitment to nature is the Community Development Officer, Dean Clarke. Almost single handed, Dean has reached out to raise money and put in back breaking work to provide RAF Valley with The Resilience Garden. It is now a place of sanctuary where RAF Valley personnel can escape and feel the embrace of nature. The noise of the reeds and leaves in the breeze drowns out all other

distractions and all RAF Valley personnel who use the garden have benefited from the positive mental health benefits of seeking a moment of mindfulness or solitude.

RAF Valley/Y Fali is now the only major RAF base within the principality, but it is surely punching well above its weight in terms of its commitment to the environment and to conservation.



Tally the Kemp's ridley sea turtle at Anglesey Sea Zoo © Crown



Tally the turtle being loaded on to the aircraft for onwards travel © Crown



Dean Clarke and volunteers at The Resilience Garden © Crown



Foxglove Covert, North Yorkshire

by **Carl Watts**

Reserve Manager,
Foxglove Covert Local Nature Reserve

Foxglove Covert is an 100 acre nature reserve at the heart of Catterick Garrison in North Yorkshire. The reserve has received vital support from the MOD since its inception in 1991. Varied habitats from lowland heath to woodland and reedbeds have resulted in 2,978 distinct species being recorded.

The new Reserve Manager, Carl Watts is prioritising links with military units based on the garrison and to that end has attended unit family days and hosted groups from across Catterick Garrison. Groups of service personnel not only help to boost the work of regular civilian volunteers, but also ensure that the reserve remains relevant to the surrounding local community. Volunteers from the Personnel Recovery Centre visit regularly as a part of their programme of activities. Family days at the reserve have been very popular and successful.

In addition to raising the profile of Foxglove Covert within the local community, an innovative approach to management is now underway. In a year which has again seen devastating floods, droughts, damaging winds and accelerated melting of sea ice in the Antarctic, it is vital to

reduce carbon emissions wherever possible. To that end, scythes have been introduced as an intrinsic part of the new habitat management regime. While limited (and decreasing) strimming and brush cutting still take place, Austrian scythes are now used by a growing number of volunteers. Not only do these 3,000 year old tools reduce the reliance on petrol, reducing fumes and carbon emissions, but they also put an end to noise pollution – volunteers can now chat while working. Scythes produce a clean cut through vegetation, rather than ripping it with nylon cord and they can be used to manage a wide range of habitats.

Grassland has already benefitted from the changed management approach. Two areas where waxcap fungi have previously been recorded, but where grass was now rank and scrub starting to encroach, have been scythed and raked, reducing nutrient levels but also avoiding soil compaction that might result from livestock or machinery. We already have a new species spotted, glutinous waxcap, and at the time of writing it is still early in the season. Hopefully these brilliantly colourful fungi will now thrive. Scythes have also been used to clear brambles and bracken and help in management of a small reedbed. They are a brilliant engagement tool too, the rhythmic movement is great for peace of mind and body – tai chi in a field!

Predannack Airfield, Cornwall

by Rachel Holder
Lead Ranger, National Trust

Predannack Airfield's rarest habitats and species include unique heathland dominated by Cornish heath, Mediterranean temporary ponds with pillwort, and extreme rarities, like pygmy rush. However, the more operational areas have plenty to offer wildlife too.

The 40ha of 'internal island grasslands', patches of vegetation between tarmac runways and trackways, are increasingly recognised as valuable for nature conservation and as a source of seed. Being within the MOD boundary has protected these areas from agricultural change, especially since the 1960s. Whilst grasslands nationally were being 'improved' with fertilisers and pesticides, those within the fence were simply mowed, retaining a good mix of traditional meadow species.

In 2019, the Defence Infrastructure Organisation's Conservation Stewardship Fund paid for a survey of the internal islands, recording an interesting mix of neutral and acid grasslands, varying from dry to damp in character, some with a strong element of heathland type species.

For the last decade, grassland areas that are not core to operational safety have been switched from regular mowing to a single late July cut, which is taken as hay by a local farmer. This allows wildflowers such as black knapweed, wild carrot, yellow rattle, greater bird's-foot trefoil, common cat's-ear, bugle and red clover to seed

amongst the grasses. These include cock's foot, red fescue, sweet vernal-grass, Yorkshire-fog, crested dog's-tail, common bent and brown bent.

With agreement, seed has been collected to sow across Cornwall, aiming to establish new wildflower meadows. In 2023, both a quad-towed brush harvester and a larger-scale tractor-mounted brush harvester passed over portions of the standing hay crop to remove some of the ripe seed. Both methods proved very effective, gathering good quantities of seed that was sifted and sorted by volunteers and then spread out on barn floors to dry.

No more than one third of the area is harvested per season, ensuring plenty remains undisturbed for insects; the hay crop is only minorly impacted. More targeted seed collection for individual species of interest, like devil's bit scabious (the food plant of marsh fritillary butterflies) and chamomile, uses a handheld petrol driven device – effectively a leaf blower in suck mode!

The seed collected in summer 2023 is destined for several Cornwall based meadow creation projects, co-ordinated by the National Trust and Meadow Match. In the future, potentially dozens of grasslands will benefit from additional species from Predannack Airfield's grasslands. We can hope to see a little more colour and buzz back in the wider landscape, thanks to these collective efforts.



The seed is immediately spread out thinly, to prevent it starting to compost © National Trust



Quad towed brush seed harvester © National Trust

DIO's Environmental Management, Protection and Sustainability team

by Richard Brooks

Principal Environmental Manager, Defence Infrastructure Organisation

I have not had to travel very far from home in 2023 to experience the impacts of climate change, with unpredictable summer weather followed by numerous named and damaging winter storms and floods across the UK. These extreme weather events really bring home the urgency of action to increase climate resilience.

50 years after the publication of the 1973 Report of the Defence Lands Committee, Defence has already demonstrated decades of commitment to environmental and sustainability delivery and improvements. *Sanctuary 52*, 2023 continues to highlight that Defence is not resting on its laurels in driving forward with change. I continue to not only be amazed by the variety of projects delivered which directly impact sustainability and improve our environment, but also by the work being done to change hearts, minds and ways of working.

Technical Services employs a wealth of subject matter experts, who lead and support much of this work. In April 2023, Dr Jon Cook joined us as Head of Department, leading specialists in environment and sustainability, health and safety, building and civil engineering, mechanical and electrical engineering, and asset class engineering who contribute to projects across Defence. Welcome to the team Jon!

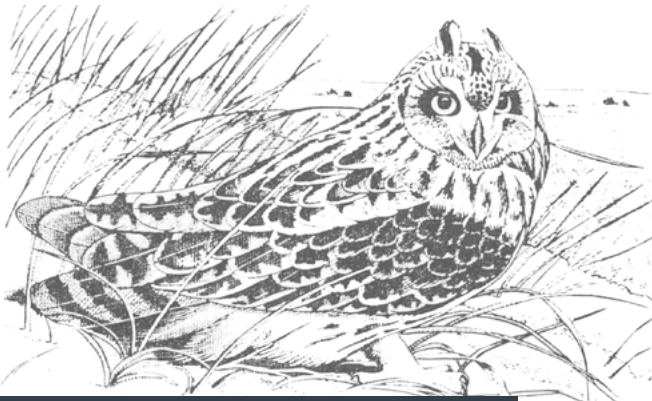
My Environmental Engagement team have continued to develop *Sanctuary*, and regular readers will notice that there continue to be tweaks and developments to the magazine. All of these changes are made following feedback, so if you have any suggestions as to how we can continue to improve *Sanctuary* then please email the team – DIO-sanctuary@mod.gov.uk

Calling notices for the next *Sanctuary* magazine and Awards will be published in late spring/early summer. The Sanctuary portal (<https://sanctuary.awardsplatform.com/>) will also remain open throughout the year for you to submit your article ideas to us. I encourage anyone involved in relevant projects to take the opportunity to highlight your endeavours and successes.

And once again, my thanks to everyone who has played a part in the delivery of this 52nd edition of *Sanctuary* magazine and the 2023 Sanctuary Awards. It was a fantastic event at Portsmouth, and brilliant that so many people could join us virtually too. I would like to offer particular thanks to Holly Broomfield, Georgina Waugh, Mel Worman, Iain Perkins, Julian Boyce and Aleasha Caple for being instrumental in organising such a great event.



DIO's Technical Services team show The Rt Hon Dr Andrew Murrison MP (Minister for Defence People and Families) Operation Nightingale's archaeological excavation at Boles Barrow, Salisbury Plain Training Area © Crown



One of Jean Clayden's sketches of a short-eared owl
© Jean Clayden

Short-eared Owl

SUBMISSIONS

If you would like to contribute to *Sanctuary* magazine or enter Sanctuary Awards, please email the Sanctuary team at:

DIO-Sanctuary@mod.gov.uk

Please could the Editors ask, with sustainability in mind, that you pass the magazine on for others to enjoy and only recycle it as a last resort. Thank you!

Useful contacts

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DIOTS-HeritageTeam@mod.gov.uk

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One of Jean Clayden's sketches of a lesser-spotted woodpecker
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