

SANCTUARY

THE MINISTRY OF DEFENCE SUSTAINABILITY MAGAZINE

Number 42 • 2013

Restoring open habitats

on heathland at Lulworth Ranges

**New solar farms will save energy
and cut bills for DIO**

**The importance of Plain puddles
created by military training on SPTA**



SANCTUARY

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Dartford warbler © Geoff Jones

Back cover image credit

Frosty morning at Porton Down
© Mark Whitehouse

Sanctuary is an annual publication about sustainable development in the Ministry of Defence (MOD), and the sustainable management of the natural and built assets across the Defence estate. It illustrates how the MOD is undertaking its responsibility for stewardship of the estate in the UK and overseas. It is designed for a wide audience, from the general public, to the people who work for us or volunteer as members of the MOD Conservation Groups.

Sanctuary is produced for the MOD by the Defence Infrastructure Organisation.

Sanctuary has been printed by the kind sponsorship of the Industry Partners below:

Conservation Group Photography Competition



Elephant seal at Kelp Point © Roy Smith

As the new editor of Sanctuary, I would like to thank Clare Backman (previous editor and Conservation Group Team leader) on behalf of the MOD Conservation Groups for her invaluable support and enthusiasm for conservation and wider sustainability across the MOD estate.

This is the fourth year of the MOD Conservation Group photographic competition and yet again we have had an excellent response with many wonderful and interesting photos. The Sanctuary board and independent judge, professional photographer David Kjaer (www.davidkjaer.com), faced a difficult dilemma but decided on a superb photograph of a Dartford warbler as the overall winner. The beautiful image was taken by Geoff

Jones, a member of the Browndown Conservation Group and fully deserves the pride of place on the front cover of this years Sanctuary.

The runner up, which can be seen on the back cover, was a frosty morning at Porton Down captured by Mark Whitehouse, from Porton Down Conservation Group.

Highly commended was the photograph above of an elephant seal, taken by Roy Smith from HQ British Forces South Atlantic Islands Conservation Group.

This year's competition has been a great success and we shall be running the competition again next year, so keep your cameras at the ready!



Foreword by **Andrew Manley** Chief Executive Defence Infrastructure Organisation

Welcome to the 42nd edition of Sanctuary, which continues to highlight the MOD's commitment to stewardship of the Defence estate and sustainably managing Defence activities. This year marks a particular demonstration of this, as it is the 40th anniversary of the MOD employing a Conservation Officer - Lt Col (Retd) Norman Claydon was originally appointed to the role in Aldershot in 1973.

DIO enables Defence personnel to live, work and train, and is continuing on the journey to becoming a world class, sustainable infrastructure provider. This year we have launched our Enhanced Operating Model, and we are now looking forward to the future with the introduction of the next generation of estate contracts.

DIO is introducing new technology to help us manage the estate more effectively, so I was particularly pleased to see this year's Silver Otter award go to a project that is using technology to protect species. The winners of the energy awards reflect some of the initiatives being undertaken by individuals, teams and our Industry Partners in order to achieve significant and enduring running cost savings and the Greening Government 25% carbon reduction by 2015. Congratulations to all the award winners.

I am very impressed with the excellent entries for this year's photography competition for the front cover image. The winning image shows a wonderful Dartford warbler.

I read with great interest the reports from around the regions, which highlights the valuable and diverse contribution our



Andrew Manley, Chief Executive Defence Infrastructure Organisation
© Crown

Conservation Groups make in conserving this unique estate. I am continually appreciative of the expertise and dedication of our DIO staff who work closely with our military colleagues to protect important wildlife and heritage as well as delivering the Defence requirements.

Finally, my thanks to the editor who has produced an excellent edition, as well as our industry partners for their generous sponsorship. Enjoy the magazine.

A handwritten signature in black ink, appearing to read 'A Manley'.

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The Sanctuary Awards

The Ministry of Defence (MOD) prestigious Sanctuary Awards recognises and encourages group and individual efforts that benefit sustainable development, wildlife, archaeology, environmental improvement or community awareness of conservation on or within land and property that the MOD owns or uses in the UK or overseas.

The 2013 Awards were divided into four categories: Environmental Project, Heritage Project, Sustainability Project and Individual Achievement. The winners of each category were considered for an overall winner who receives the coveted Silver Otter for one year.

The Sanctuary Award Board

The Sanctuary Award Board for 2013 was made up of Defence Infrastructure Organisation: Julia Powell, Deputy Head (Policy), Jane Hallett, Assistant Head (Estates Policy), Alan Mayes, Deputy Head (Secretariat), Pippa Morrison, Assistant Head (SD Policy), Giles Rowe, Principal Environmental Advisor and from the Joint Nature Conservation Council Paul Rose, Director of Evidence and Advice, who acted as external judge.

ENVIRONMENTAL PROJECTS AWARD **WINNER** SILVER OTTER WINNER

Passive Acoustic Monitoring (PAM) Project



Aberporth range head © Crown

In 2011, a bespoke system was designed and launched at the QinetiQ managed site, MOD Aberporth. Located in Cardigan Bay, a Special Area of Conservation (SAC), which is particularly important for marine mammals. The new system improves the sites ability to monitor trials and halt activity when marine mammals are detected in the vicinity. Martin Pope, an engineer from Surface Target Solutions (STS), along with a small team of QinetiQ employees, designed and tailored the system specifically to meet the needs of the Range. The aim was to produce a cost-effective and robust

product that would be placed in a very hostile environment with a very real risk of damage or loss. It also had to be capable of being operated from the Range headland, which is in excess of 20 miles from the target area! Since its first deployment, the system has operated successfully, enabling QinetiQ to play an even more active role in marine conservation, while at the same time delivering essential test and evaluation services to the UK MOD.

Read more about this project on page 55.



Bottlenose dolphin © Crown

THE SANCTUARY AWARDS

ENVIRONMENTAL PROJECTS AWARD **RUNNER UP**

Removal of Sea Buckthorn at Pembrey Sand Dunes

Pembrey Sands Air Weapons Range is a Site of Special Scientific Interest and is situated in South Wales where the sand dunes have been invaded by sea buckthorn *Hippothae rhamnoides*. This has altered the habitat by suppressing low growing plants and fixing atmospheric nitrogen into the soil and over time, the dune system's plant community changes to an 'unfavourable condition'.

Since 2007, 29,000 m² of sea buckthorn have been cleared. By working in stages, with each stage assessed to improve methods, it was decided to use a mechanical grab to lift individual plants out; maintaining the contours of the dunes and leaving other native plants undisturbed.

Guided tours are organised to share good practice with local conservationists and these methods are to be utilised on other MOD sites.



Results from the second phase of clearance © Crown

HERITAGE PROJECTS AWARD **WINNER**

External Refurbishment of Former Army Staff College



Refurbished former Army Staff College © Crown

The Staff College within the RMAS campus at Camberley was built following pressure in the mid 19th century to reform the British Army and to invest in officer training. The architect Sir James Pennethorne was commissioned to design the building in 1857, and construction was completed in 1862.

However, by the end of the 20th century, the building's exterior had deteriorated significantly.

Comprehensive work has now been carried out, and in many instances using traditional methods and recycled materials. The opportunity was also

taken to insulate the replaced flat roofs. Internally, the top floor has been refurbished to provide 27 rooms for single living accommodation, 11 with en-suite shower rooms.

The building was provided with a complex over-roof to allow construction work to proceed over two winters uninterrupted by bad weather, allowing the offices within the building to remain occupied. Specialists came from far and wide to see the unusual buttressed scaffold during the project.



Aerial view © Crown

HERITAGE PROJECTS AWARD **RUNNER UP**

Bodmin Keep Project

Bodmin Keep is a Grade II Listed Building, part of the former Duke of Cornwall Light Infantry Barracks and now houses the Rifles Museum. It is an impressive local landmark in the town, constructed to represent a French Chateaux but in the past had been unsympathetically re-roofed using asbestos cement slates. The roof covering had failed with slipped slates causing a hazard to the public and water leaks damaging the building fabric.

The project replaced the inferior slates with natural slate, incorporating traditional detailing and leadwork. It was also possible to include roof insulation, improving the energy performance and creating a more usable space within the attic. Bats were also accommodated with the formation of access points and bat roosts. Ultimately the project has contributed to the preservation of an important historic building for the use and enjoyment of future generations.



Bodmin Keep completed © Crown

SUSTAINABILITY AWARD **WINNER**

Sustainable Mattresses

Aspire Defence Services Limited (ADSL) provides a total Facilities Management (FM) service to the MOD on Project Allenby/Connaught. As part of their Sustainability Strategy they have developed a process for assessing the social, environmental and economic impacts of the goods and services they buy and this has been used to find a more sustainable way of managing the 18,000 mattresses under their control.

After reviewing the issues associated with mattresses (waste, energy and labour conditions) they engaged with

suppliers to develop a new solution. All old mattresses are returned to the supplier who removes and recycles fabrics and reuses the steel springs. This dramatically reduces waste and energy whilst supporting a social enterprise which specialises in supporting disabled people into work. The sustainable procurement approach is standard practice for ADSL and other examples of its continued application include procurement of stationery supplies and grounds maintenance and waste management contracts.



Mattress refurbishment © ADSL

SUSTAINABILITY AWARD **RUNNER UP**

Sealand Range Dual Purpose Path

For twenty years there has been a desire to create free public access through Sealand Range, connecting local populations to work and leisure opportunities in and around Chester and Shotton.

Whilst the MOD has always been willing to consider a route, attempts to fulfil this demand have struggled to meet the requirements of all landowners.

In 2011, DIO began working with the charity Sustrans, Flintshire Council, Cheshire and Chester West Council and

the RSPB, with the project finally successfully moving forward.

Land and visitor management issues were overcome with the creation of approximately 1.5 km of new route and extensive improvements to existing tracks.

Cllr Bernie Attridge, Deputy Leader of Flintshire County Council and Cabinet Member for Environment, said: "This traffic free route will provide increased accessibility for employees on the Deeside Industrial Park as well as local

residents and will improve opportunities for cycling and walking in this area."

Read more about this project on page 16.



New path in use © Crown

THE SANCTUARY AWARDS

INDIVIDUAL AWARD **WINNER**

Rosalind Gourgey



Rosalind Gourgey © Arnold Slater

Rosalind Gourgey, Sustainability Manager for the Ministry of Defence Police (MDP) Headquarters Wethersfield, has led a number of successful projects. A redundant building was converted into a thriving Family and Sustainability Centre where the Army's local mother and toddlers' group, many with family members deployed overseas, now meets regularly, with a place to socialise.

Rosalind also negotiated a site for a kitchen garden, for which Army residents constructed an attractive picket fence from recycled pallets and now relax with their families growing their own vegetables.

Park Wood, a remaining fragment of ancient woodland achieved Local Wildlife Site Status. Footpaths for site staff and residents, wood piles and nest boxes for birds and invertebrates have been installed. Wildlife monitoring continues to ensure that threatened species are protected.

Rosalind was instrumental in building a successful relationship with the Woodland Trust, DIO and Forestry Commission, culminating in the planting of the only Diamond Jubilee Wood in Essex. Local schoolchildren joined villagers and staff to plant 1,000 trees in the new 79 hectare native woodland.

Read more about Rosalind Gourgey's work on page 72



Rosalind planting up the Diamond Jubilee Wood © Crown

INDIVIDUAL AWARD **RUNNER UP**

Dave Curtis



Dave surveying the estate © Crown

Dave Curtis is a member of the DIO Northern Ireland Estate Management Team and has been responsible for delivering a wide range of tasks to manage the 1,211 ha of the DIO Ops Training NI designated as Areas of Special Scientific Interest (ASSIs). The condition of the ASSI features at both Magilligan Training Centre and

Ballykinler Training Centre has improved from 'unfavourable' to 'recovering due to management change'.

The Magilligan dune system is the most intensively studied coastal accumulation site in Ireland and amongst the top such localities in Europe.

There are no DIO ecologists based in Northern Ireland and since 2007 Dave Curtis has taken on the additional responsibility of utilising DIO funding and working with term contractors to carry out specific tasks over very large areas such as fencing and water supplies for livestock, and controlling sea buckthorn, bracken, ragwort and rabbits. He has worked closely with farmers to provide grazing infrastructure and maximise the areas available for conservation grazing,

which is key to managing the dune vegetation.

The reputation of MOD amongst this stakeholder community has been considerably enhanced by the work done by Dave Curtis. This work was so effective that it prompted Northern Ireland Environment Agency (NIEA) to change the way they assess the condition of ASSIs and they are now citing MOD, DIO Ops Training NI as a model for other major landowners in Northern Ireland to follow in the way they deliver ASSI management.

A number of key development projects such as a new Vehicle Firing Point have been delivered in the last two years following statutory appraisals and these have been progressed quickly thanks to a strong and positive relationship with NIEA.

The MOD Energy Awards

Over the past two years £57m has been invested to improve the energy efficiency of the Defence estate, reduce running costs and drive down carbon emissions in support of the Greening Government target to reduce estate-related carbon emissions by 25% by 2015, some 245,673tCO₂.

This investment is being delivered through the Energy Spend-to-Save Programme and the introduction of the Strategic Energy Management Services (SEMS), which since 2011 have delivered some 900 energy efficiency projects, cost savings of £26.2m and carbon savings of 149,055tCO₂ - equivalent of the emissions from 65,000 family homes. The programme is now well into the third year that will see a further investment of £55m and enduring savings of £70m.

However, behind this great investment programme there is an even greater band of energetic individuals and teams from across MOD and our Industry Partners. Without their hard work and dedication the successful delivery of such a programme and the savings achieved to date would not have been possible. The 2013 MOD Energy Awards recognise some of these teams and individuals.

TEAM ENERGY AWARD **WINNER**

PRIDE Energy Team



RAF Benson after © Crown

The PRIDE Energy team has been instrumental in ensuring the South East region has made significant cost and carbon savings during 2012/13 by delivering a large scale LED lighting programme across 100 sites and nearly 6,000 buildings.

Team members Peter Smith, Energy and Sustainability Director; Eunice Mabey, Energy and Environment Manager; Gareth Pryce, Project Manager; and Martin Ayling, Commercial Manager, quickly identified that collaborative working with all stakeholders would be key to ensuring the successful and quick delivery of the £5.4m lighting programme across the estate that has unique lighting requirements.

The team identified the benefits of working in partnership with Philips to install the latest in lighting technology solutions that provide enduring energy and maintenance savings holistically across the South East estate. The team were proactive in their engagement with local site teams and organised workshops and demonstrations to explain the benefits to be gained from the new technology, not just energy savings but also enhanced working environments.

The team delivered tailored lighting schemes at sites that are sensitive to operational needs of particular buildings and deliver savings without compromising on light quality, in fact often improving the lighting levels. For

example, the lighting upgrade of four hangars at RAF Benson, one of the busiest front line support helicopter bases, has transformed the previously dark orange working environment to 'daylight' conditions increasing visibility and improving safety and security. The existing high bay yellow SON 400w lamps have been replaced with Gentlespace luminaire, a highly efficient LED technology that provides energy savings of at least 30%. Following positive feedback from the users of the hangars the technology is being rolled out to the remaining three hangars at the base and at the Army Air Corps at Middle Wallop during 2013.

The team's commitment and effort to ensure all stakeholders were supportive of the lighting programme aims has resulted in impressive savings of some £2m and 9,000tCO₂ for 2012/13 alone.



RAF Benson before © Crown

THE ENERGY AWARDS

TEAM ENERGY AWARD **RUNNER UP**

HMS Gannet

Working as part of the wider RPC Scotland Energy Team and the Strategic Energy Management Service (SEMS) for the region, Robin Scott, Energy Management Technician, Turner Estate Solutions Ltd; Lynn Lydon, SHEFA; and Ian Bogan, Building Control Officer, the core energy team at HMS Gannet have ensured the site has reduced fossil fuel and electricity costs by an impressive 50% by 2013 and saved 560tCO₂.

This massive saving at the site, home of the Search and Rescue Flight and one of Britain's busiest rescuers, is down to the dedication and commitment of the team who ensured the local delivery of the SEMS and the awareness campaigns, which at first were met with resistance. The determination of the team to implement initiatives such as temperature set point reductions and time clock adjustments to reflect building occupancy levels; removal of portable heating appliances; and regular communication and engagement with key personnel at the



L-R Robin Scott, Energy Management Technician Turners Estate Solutions; Lynn Lydon, HMS Gannet SHEFA; Ian Bogan, HMS Gannet Building Control Officer © Turner Estate Solutions Ltd

site meant this initial resistance was overcome and energy improvements accepted by all at site.

Although often challenging the team's communication efforts to change 'mind

sets' and encourage energy efficient behaviours at the site have ultimately been rewarding having made energy cost savings of £157k. Their best practice has also been shared with other sites across the region.

INDIVIDUAL ENERGY AWARD **WINNER**

Stuart Martin



Stuart Martin © Turner Estate Solutions Ltd

Without a doubt the impressive performance of RPC Scotland since 2011 to reduce energy costs by 21%, despite longer and colder winters across the region, is down to the leadership and dedication of Stuart Martin, Energy Engineer for Turners Estate Solutions Ltd.

Stuart led the RPC Scotland Energy team in the delivery of the energy spend to save investment and the Strategic Energy Management Service (SEMS) and worked tirelessly to ensure cost and carbon reductions were continually made. Overcoming delivery, behavioural and awareness barriers Stuart's dedication and commitment has ensured £2.6m and 13,718tCO₂ have been saved, exceeding the predicted savings targets.

Stuart identified that building strong collaborative relationships with sites was key in being able to change behaviours and working practices to drive down energy usage. He used training forums, email campaigns and displays to raise awareness to encourage individuals to make simple changes to help reduce energy use across the region and enhance and support the technological initiatives such as Building Energy Management controls.

Stuart has also been a key contributor to the MOD-wide Energy Programme Working Group and is always willing to share and seek out best practice across contracting boundaries.

Forward Deploying Utilities Management



Martin Rouse, Area Utilities Manager for the Plymouth area, visits HMS Raleigh © Crown

Autumn 2013 will see the introduction of a team of approximately 35 Area Utility Managers (AUMs), an initiative of the Defence Infrastructure Organisation to drive forward utilities reduction including energy, waste and water (within buildings) and management to support the MOD's commitment to achieving the Greening Government targets.

The AUMs are part of the DIO Operations Development and Coherency (ODC) Utilities team, and will cover the 33 Service Delivery Areas (SDAs) across the UK and sites on our overseas estate. The AUMs will work

collaboratively with a number of site personnel, including Heads of Establishments, Industry Partners and SDA teams, to develop site specific utilities plans, realistic and achievable reduction targets, and utility performance reports.

The utilities plan will set out how a site will manage and reduce utility consumption through the identification of all the activities that can affect a positive change, such as energy efficiency projects or behavioural change initiatives. The AUMs will also work with the relevant Industry Partner to ensure their Strategic Energy Management Services (SEMS) are targeted appropriately locally and will work with the SEMS bureau to produce performance data that will be shared with each site and for corporate reporting purposes.

The day-to-day work of an AUM is expected to be varied, not least due to the nature of the different sites that they will be working with. A key aspect of the job will be working and communicating with a wide group of

people to ensure utilities plans are developed and, more importantly, implemented and sustained. The AUMs will assist in helping to identify project opportunities, provide utility advice, promulgate and support behavioural change communications and initiatives. While the AUMs will have a role in assisting a site to reduce consumption, successful delivery of a site utilities plan will depend on all stakeholders playing their part to make real changes to utilities consumption across the Defence estate.

A key part of the AUM capability will be the sharing of knowledge and expertise, supported by the wider utilities team who will provide the strategic and policy direction. Individual AUMs will not be expected to be fully conversant in all aspects of utility management, especially those of a more technical nature. Instead the AUM 'network' will develop a wide range of skills that can be shared through advice giving, training and mentoring within the team. Additionally, a training and development programme for the AUM team is being developed to ensure common competences, skills, knowledge and expertise are attained by individual AUMs.

The AUM team are currently being recruited, with a small number of AUMs already taking up the reins within the UK, with others to follow from October 2013 onwards. It is early and exciting days for this new team as it forms and develops the capability, but it is one that will over the forthcoming months and years have an important role in helping to reduce and manage the MOD's utilities consumption, and in turn save money and contribute to the achievement of our Greening Government targets.

For further information about the AUM team please contact the ODC Utilities Energy Management Lead: Tracy Buckby – tracy.buckby601@mod.uk.

Rebekah Jones
Energy Management
ODC Utilities
Defence Infrastructure Organisation

50 years of Vigilance: **RAF Fylingdales** celebrates its golden anniversary



11th March 1963: General view of the tracker area © RAF Fylingdales/Crown

RAF Fylingdales is 50 years old in September 2013 and to celebrate its golden anniversary the Station Commander, Wing Commander Owens, and her staff, are planning a series of events which will reveal a tantalising glimpse of the history and current role of this important RAF base located on the beautiful and remote North York Moors.

The Ministry of Defence occupies approximately 230,000ha of land across the UK in order to support the delivery of defence capabilities. In some parts of the country the functional buildings constructed on army bases, naval dockyards and RAF establishments lie cheek by jowl alongside features of outstanding natural beauty and historic importance.

Such is the case at RAF Fylingdales where the keen observer will see that lying in close proximity to the base is a variety of archaeological monuments including Bronze Age burial cairns, medieval wayside crosses and the narrow, paved footpaths, or Trods, carefully laid down to assist the traveller across the moorland bogs. There are 14 known archaeological sites and buildings within the boundary of RAF Fylingdales with several more close to the site perimeter, but it is entirely

possible that further features await discovery under the dense covering of heather within the boundary of the base. For instance, during the summer of 2003, a moorland fire to the east of RAF Fylingdales burnt away the underlying peat and revealed a previously unknown landscape containing 4000 year old prehistoric carved rocks and 20th century military training remains.

But, no matter how hard you look, there is one site that cannot be seen. The technical area at RAF Fylingdales was host to one of the most iconic military structures of the Cold War period - the Ballistic Missile Early Warning System or massive 'Golf Balls' - which dominated the moorland landscape for almost 30 years between 1963 and 1992.

To some people, prehistoric stone circles and Roman forts are true archaeological sites. To others the dark satanic mills of the industrial revolution are the torchbearers of our cultural heritage. But to an increasing number of people the investigation of our military past, looking at how we have defended the nation against threats - actual and perceived - using the technology available at the time, is proving to be a fascinating and enlightening field of study. Some sites, such as the Martello Towers along the southeast coast hark back to Napoleonic times, but other sites were built, used and abandoned within living memory, and the iconic 'Golf Balls' at RAF Fylingdales, fall into this category.

In the 1950s, the MOD owned a larger area of Fylingdales moor than at present which was used for live firing and dry training. The site's importance was significantly increased in 1959 when the UK and US Governments selected Fylingdales as the site for the UK component of the Ballistic Missile Early Warning System (BMEWS). Other sites were at Thule Airbase in Greenland and Clear Air Station, Alaska. These fed information back to computers of North American Defence Command (NORAD) in the Cheyenne Mountains in Colorado.

Construction work on the Tracker site began in 1960 and was complete by March 1963, with operations commencing on 22nd July and formal commissioning on 17th September. As originally designed, and depending on the exact launch site, 15-30 minutes warning could be given to the eastern states of the US and between 2½-17 minutes to the British Isles and Western Europe. The advent of new types of weapons and space technology from the late 1970s meant that by the mid-1980s BMEWS was no longer able to provide sufficient warning of an attack. The modernisation of BMEWS was sanctioned by President Reagan in 1982 and in 1986 the British Government announced the upgrading of RAF Fylingdales and the Solid State Phased Array (SSPAR) which currently stands, was constructed between 1988-1992.

In 1968, Fylingdales acquired a secondary role of Space Surveillance, enabling it to monitor the activity of military satellites and to plot the location of disused space equipment and debris. Currently there are over 32,000 items of space debris 10cm and larger which are monitored by the SSPAR at Fylingdales. These range from satellites the size of the International Space Station to a camera, a glove and a screwdriver!

RAF Fylingdales is located in the North York Moors National Park and, as such, tries to keep its impact on the surrounding environment as low as possible. To assist in this, the RAF Fylingdales Conservation Group is chaired by the Station Commander and includes experts on archaeology, ecology and conservation. The diversity and abundance of flora and fauna all fall within the remit of the group, as do the sites of archaeological and cultural heritage significance on the base and the surrounding area.

For 50 years, RAF Fylingdales has been at the cutting edge of tracking potential missile threats and monitoring the orbits of space debris. To mark the 50th anniversary of the base plans are afoot to create an exhibition which presents the origins and development of RAF Fylingdales and the history of the surrounding area. With the aid of objects housed in the base, artefacts loaned from Whitby Museum, archival photographs and interpretation panels the exhibition aims to explain the importance of RAF Fylingdales and the surrounding area, from prehistory through to the present time.

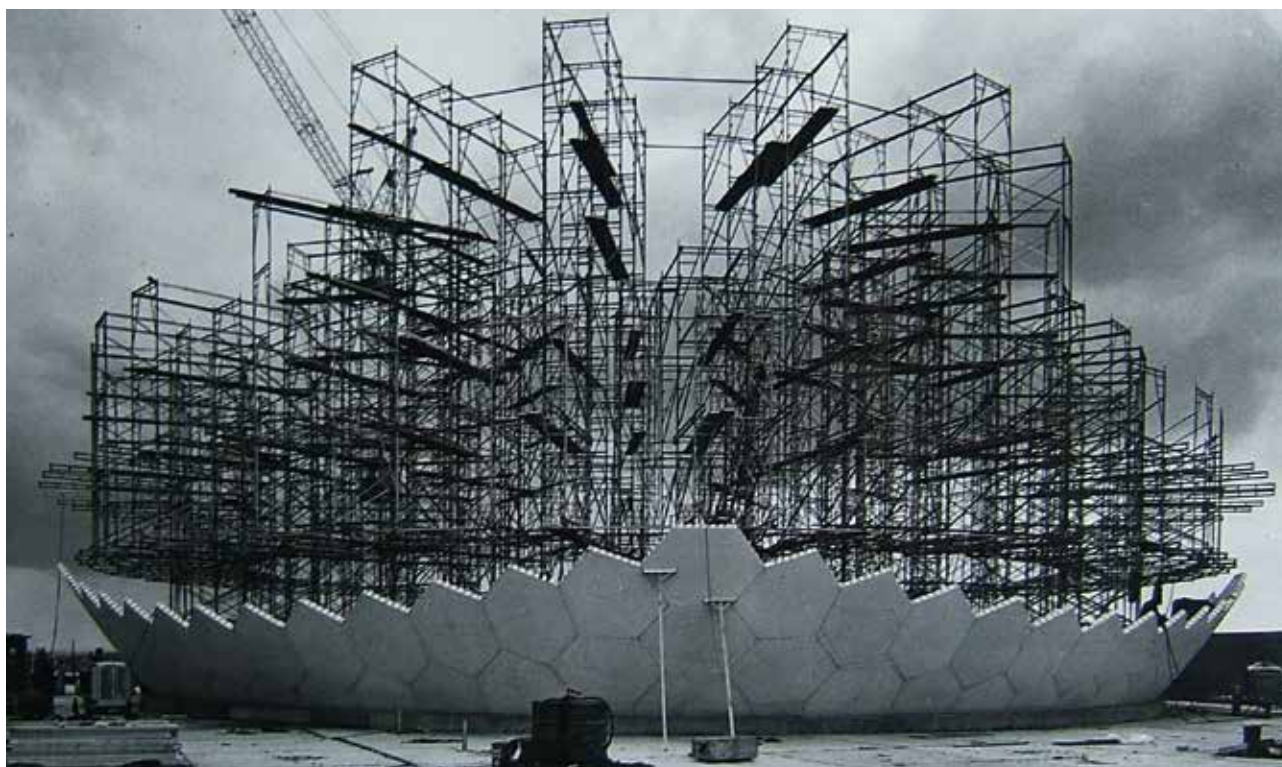
Phil Abramson
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30th May 1962: Construction workers fitting Radome panels © RAF Fylingdales/Crown



Decorated boulder of probable late Neolithic date (c.2500 BC) from Fylingdales Moor, North York Moors National Park © Blaise Vynr



28th May 1962: This picture shows how the 1646 honeycomb-shaped sections fit neatly together © RAF Fylingdales/Crown

Keeping our beaches shipshape



Britannia Royal Naval College Officer Cadets having a well earned rest after a litter picking packed day; Hopes Nose, Torquay in background © Bill Amery

A team of British and International Officer Cadets who are under training at Dartmouth's Britannia Royal Naval College (BRNC) have been tackling beach litter in Torbay and along some of the South West's beautiful and scenic beaches and coastal paths.

Chief Petty Officer (CPO) Bill Amery, an Instructor at BRNC and local resident, co-ordinates with the Keep Britain Tidy's Beach Care Project and the local council, to target specific beaches and coastal paths where litter has built up. The cadets were taken to the targeted areas and 'sweep' the beaches from one end to the other, removing and recording the items they find.

Keep Britain Tidy's Beach Care Project is working with local community groups throughout Devon and Cornwall in an effort to understand beach litter issues, campaign against these issues and help to keep the stunning South West beaches clean. As well as working with the cadets at BRNC, the project has set up successful residents' beach clean groups in the South West and are keen to work with other groups in the area who want to help out with their beach. Full training, equipment and support are given to those who want to participate.

The project which is supported by South West Water, the Environment Agency, Cornwall Council and Visit Cornwall has completed over 300 beach cleans across Devon and Cornwall since April 2010 and surveyed over 37,000 litter items.

Neil Hembrow, Beach Care Project Coordinator says, "Having the Britannia Royal Naval Cadets involved is fantastic and great news for Torbay. They have removed over 120 bags of litter from the area over the last 2 years. Being extremely keen and physically fit they are able to carry bags and equipment to areas where access would normally be difficult due to the terrain, such as Hopes Nose in Torquay".

CPO Bill Amery said, "These International Cadets come from all around the world to take advantage of the world class training delivered at Britannia. It is a great chance for them to interact with the local community and build long lasting

relationships. By giving up a day of their leave and rolling their sleeves up and getting their hands dirty, they have assisted the local community and become excellent ambassadors for their countries. It is a great example of people coming together to help the local environment and keep these picturesque beaches beautiful for the coming seasons. It is definitely a litter picking packed day for them."

Bill Amery
CPO Warfare
Britannia Royal Naval College
Dartmouth



BRNC cadet in the bush © Bill Amery

RFA Darkdale shipwrecked tanker in St Helena



Bow section of the RFA Darkdale shortly after being torpedoed © Museum of St Helena

St Helena is one of the most isolated islands in the world and is famously known as the island to which the British Government exiled Napoleon after the Battle of Waterloo.

The island is located in the south Atlantic, with the nearest land mass being Africa 1,200 miles away. Due to its isolation, the island has a number of endemic species and genera, so when the MOD were told that a shipwreck located in the main port was leaking oil it quickly became apparent that this was a high priority issue.

RFA Darkdale was one of the first ships sunk south of the equator in WWII. In the early hours of the 22nd October 1941 she was torpedoed by German U-Boat U68 whilst at anchor, exploding and splitting in two, eventually sinking, sadly with the loss of 41 lives.

The DE&S Salvage and Marine Operations Team (SALMO) are responsible for the legacy wrecks management programme and were tasked with identifying what action, if

any, would be needed to prevent the shipwrecked tanker from becoming an environmental hazard. The SALMO team joined forces with an environmental advisor from the Defence Infrastructure Organisation (DIO) to design and carry out an investigation to identify the condition of the shipwreck, the amount of oil remaining onboard and the potential environmental risks.

In the spring of 2012, a diverse team comprising of marine salvors, an archaeologist and environmental/ecological advisers (from the MOD and RPS Group PLC) set off to the island to undertake a thorough survey of the ship and collect environmental data from the area. The environmental survey found that the Darkdale has become an important artificial reef in James Bay. The wreck is surrounded by maerl beds, an important habitat which, as well as supporting high biodiversity, acts as nursery grounds for juvenile fish. Large populations of fish

exploit the shelter provided by the wreck; several are endemic to the island and listed on the threatened species list such as the bastard cavalley pilot and bastard fivefinger. Other species recorded on the wreck such as the cunningfish and bastard cunningfish are only found in the waters of St Helena and Ascension.

Working in such a remote and remarkable place meant that no day was tedious, the long survey days were regularly interrupted by the local wildlife, including pods of pantropical spotted dolphins and bottlenose dolphins. The team also got up-close and personal with a manta ray which was keen to investigate the remotely operated vehicle with which the salvage team were surveying. Collection of flora and fauna from the sea bed found several taxa that have not been previously described and are new to science; these are currently being looked at by the Natural History Museum.

One of the benefits of this survey is that all the ecological information collected will be shared with the environmental department of the St Helena Government, to assist with their ongoing research and monitoring of the marine environment within James Bay and assist with the conservation of this valuable area. The results of the ecological surveys are currently being used to inform a risk assessment to identify what further work is needed to protect this ecologically sensitive and important habitat from damage from RFA Darkdale.

Kim Brown
Natural Environment Advisor
Defence Infrastructure Organisation



Photograph from the remotely operated vehicle of a moray eel close to the wreck © Crown

Removal of man-made reservoirs Senne Training Area Germany



Natural Senne stream © Dr Gerhard Lakmann

When the British Forces took over the management of the 115 km² Senne Training Area in North-Rhine-Westphalia, Germany, after World War II, there were several reservoirs located within the estate.

These lakes were all man-made by the construction of dams across natural streams and brook valleys. The German Army built some of the reservoirs in the 1930s for military exercises, whilst others served as fish ponds, with the largest reservoir measuring 600 metres in length.

These still lakes and ponds were not a natural feature of the landscape, whereas flowing watercourses over sandy surfaces are much more characteristic of the Senne. The Senne Training Area is the source of many streams, which are the headwaters of the Rivers Ems and Lippe, two of the major rivers in North-West Germany. The Senne streams run through prominent brook valleys, which, over thousands of years, have cut their way through the otherwise rather flat landscape.

The construction of reservoirs across the Senne many decades ago had a major impact on the natural flowing watercourses, resulting in deterioration of the habitat of indigenous aquatic species. The dams proved to be an insurmountable barrier for these species and several fish became extinct in the headwaters. Furthermore, the dams acted as a 'catch' for sediments

and organic material, which, over many years, had converted into a putrid sludge.

The Senne Training Area is designated as a Fauna, Flora and Habitat (FFH) Area (equivalent to Special Area of Conservation (SAC)) and a Special Protection Area for Birds (SPA). The Senne streams are a particularly precious habitat within these areas, as their waters are very clean and crystal clear. The streams provide habitat for rare birds (kingfisher, black stork, dipper), rare fish (miller's thumb or bullhead, brook lamprey, brown trout), dragonflies and damselflies (beautiful demoiselle) and other aquatic insects and water plants.

The Training Area is still managed and administered by the British Forces, who are subsequently liable for the safety and security of the estate. In 2009, the German authorities conducted a

statutory safety inspection of all reservoirs in the region, which also applied to those within the Senne Training Area. It transpired that none of the dam constructions within the Training Area complied with current safety regulations. In a severe flood scenario, the old dams and walls were found to be vulnerable to bursting and therefore presented a risk to the areas and roads downstream. As a consequence, the British Forces were requested to guarantee the safety of these reservoirs.

Modification of the dams and reservoirs to meet current technical specifications and ecological standards would have been prohibitively expensive. As the British Forces did not require the lakes for military training and following close consideration and co-operation with the German authorities, it was decided to carefully drain the lakes and remove the existing dams. In coordination with the German Higher Water Authorities, the British Forces drained 15 reservoirs over a period of four years, using their own resources, man-power, plant and machinery. Dr. Lakmann, Scientist of the Senne Biological Centre in the County of Paderborn-Senne, was appointed as the ecological expert and consultant throughout this project and undertook surveys of each reservoir for its habitat and rare species. At the Boelke reservoir, for example, an endangered 'Red List' plant - the alpine pondweed *Potamogeton alpinus* was discovered and so an oxbow had to be modelled into the stream in order to protect its still water habitat.

During the demolition, the debris of the dams and other contaminant materials were removed and properly disposed of and the original structures of the box-shaped brook valleys were re-modelled to as natural a shape as possible.

Now that the reservoirs have been removed and the streams restored to free-flowing waters, nature is gradually returning to its original condition. The streams are forming their typical, meandering loops, with alternating gentle slopes and steep embankments. The natural current in the brooks now prevents the formation and deposit of sludge. Aquatic species are once again able to swim upstream to the river springs; initial investigations have shown that the rare species of fish (e.g. bullhead) have already returned to the headwaters of the Senne streams.



Boelke dam before demolition © Dr Gerhard Lakmann

In addition to the safety aspects and regulations, the European Water Framework Directive (EWFD) prescribes that good ecological conditions must be achieved in all watercourses by the year 2015. Ecological permeability in flowing watercourses is a significant criterion of good ecological condition and by removing the man-made dams in the Senne and recreating the original, natural characteristics, the British Forces have achieved a secondary effect that is beneficial to the objectives of nature conservation.

The Senne Training Area, which contains gallery ranges and large field-firing areas used by infantry and a variety of military vehicles, is the most significant area of land designated under Natura 2000 in the Federal State of North-Rhine Westphalia. The Training Area and particularly the danger areas behind the ranges, remain one of the very few places in the State where the historic Westphalian cultural landscape

has been retained, as almost everywhere else, it has been destroyed by agricultural or industrial use.

Dr Gerhard Lakmann
Scientist of the Senne Biological Centre
County of Paderborn-Senne
North-Rhine Westphalia

This includes the 115 km² of the Senne Training Area, where Dr Lakmann acts as a biological and ecological adviser to the Federal authorities and British Forces and was produced in co-operation with DIO Ops Training (Germany)



Boelke demolition © Dr Gerhard Lakmann



Brook lamprey © Dr Bernd Stemmer

New Sealand Access Route proves great success



Grand opening © Andrew Pratt, Cheshire West and Chester Council

Sealand Ranges, owned by The Ministry of Defence since 1913, is a busy training facility, catering for Regular and Reserve Army units, Cadet units, as well as police forces and civilian rifle and pistol clubs, which are members of the National Rifle Association.

The Sealand Rifle Ranges are located on the northern bank of the Dee Estuary, straddling the English and Welsh border. Consisting of three small arms firing ranges, the site nestles between two very contrasting sites - the Royal Society for the Protection of Birds (RSPB) Dee Estuary Burton Mere Wetlands Reserve to the northwest and the Deeside Industrial Park to the south east.

Forming part of the Dee Estuary, a European Marine Site, Sealand is covered by a series of designations: a Special Area of Conservation, a Special Protection Area, Site of Special Scientific Interest (SSSI) and a Special Protection Area for birds and a Wetland of International Importance (also known as a Ramsar site).

As the numerous designations indicate, the Dee is of international importance, particularly for water birds and during migration, when wader populations move along the west coast of Britain. As well as being neighbours the RSPB also look after the grazing tenancy of the MOD owned saltmarsh and enclosed range land to encourage and support these wildfowl and wading birds.

At the time of purchasing Sealand, John Summers and Sons of Hawarden Bridge Steel Works, one of the largest manufacturers of galvanized steel in the country, were located where Deeside Industrial Park now exists. As a private means of access for the steel workers John Summers and Sons constructed a

road, running south from Station Road nr Neston to the industrial plant. This remains in place, passing directly through the range and the neighbouring RSPB reserve.

Industry on the Dee has evolved and expanded, employing many from the local community. Throughout this time the MOD has maintained an agreement with the now TATRA owned steel mill and the United Paper Mills (UPM) located on the Deeside Industrial Park, allowing workers to walk or bicycle through the range. For many this is a more desirable alternative to a significantly longer journey, using very busy and dangerous main roads.

This historic agreement is only available to local Deeside workers. Unrestricted access would benefit large numbers of locals and visitors and encourage sustainable travel. However, due to the inherent matter of safety associated with a live firing range, free access for the general public has never been an option.



Impressive boardwalk crossing wet pasture, over looking the Dee © Crown

Numerous discussions have taken place over the last ten years in a bid to identify how public access can be improved. Whilst the MOD have always viewed opportunities for safe and secure access improvements in a positive light, it has been difficult to find a collective agreeable solution amongst all landowners.

In 2008, the MOD was approached by Sustrans as part of a wider project to open up a permitted dual purpose path along the Dee. Naturally, the MOD was keen to be involved with the hope that an answer could be found that would improve site security and safety, and in turn benefit the local communities.

Rather than permanently dedicate a public right of way, the decision was made to seek a permissive route constructed to the relevant specifications. This would be installed under an agreement with all relevant parties, and managed by the two local authorities.

Given that a route requiring closure every time the range came into use would not be suitable, all of the interested parties: Cheshire West and Chester Council, Flintshire County Council, Network Rail, DIO, the RSPB and Sustrans, had to agree upon a solution that would be safe to use, but also accessible for the majority of the time.

In addition to considerations given to the security and management of the Range, it was also necessary to consider our neighbour and tenant, the RSPB. Due to the use of sheep to graze the

salt marsh and neighbouring land - a SSSI maintenance requirement - any agreement had to allow for closure of the permitted dual purpose path with no advance notice for stock management.

This is vitally important, as at times of extreme weather and tide, sheep must be moved off the marsh quickly. Additionally, stock must be moved for general husbandry such as dipping, shearing and drenching. The introduction of a multi user route open to cyclists, walkers and dog walkers had the potential to make the herding of stock along the same hard track impossible.

Options were discussed that would place the trail away from the danger of the ranges and allow for a permitted dual purpose path that is easy to use, enabling a flow of cycle traffic and

pedestrians. A route running along the eastern boundary of the site was agreed upon, incorporating Network Rail land and following an existing boundary across wet pasture to the north of the ranges. The chosen route completely segregates the public from the ranges - the ideal scenario. This enables security at Sealand to be improved and walkers and cyclists can have virtually free passage along the new route, unaffected by the possible dangers and constraints of live firing.

The final signed access agreement enables public access, but delegates the responsibility of management to the local authorities. Stipulations are made to matters that may have a negative impact upon Sealand Range and RSPB, such as dog control and route maintenance. Finally it ensures the route can be closed when necessary to allow for stock management or site maintenance.

Construction of the 3.5km permitted dual purpose path began in January 2013. An extensive boardwalk was installed across the wet pasture, linking with newly laid track on the eastern boundary. The new route offers safe passage around the estate, with stunning views across the Dee. Completed in only nine weeks, the permitted dual purpose path was officially opened to much acclaim on 18th July 2013. Demand has already exceeded expectations with over 8,000 users a month recorded since April.

James Nevitt
Environmental Advisor
for Access and Recreation
Defence Infrastructure Organisation



The public enjoying the new boardwalk © Crown

Hazel dormice at Bicester



A torpid dormouse @ Iain Perkins

The threat posed by improvised explosive devices in recent conflicts has highlighted the role of the newly formed Defence Explosives Ordnance Disposal, Munitions and Search Training Regiment (DEMS Trg Regiment). Their importance to existing and future conflicts has been underlined by the creation of a new UK centre of specialisation for EOD, Search and Ammunition Technical Training following the amalgamation of the two EOD, Munitions and Search Schools from Southam, Warwickshire and Chattenden, Kent.

The project to provide suitable DEMS training facilities at Bicester Garrison commenced in February 2010 and was completed in September 2012. The project cost approximately £100 million and consisted of building

accommodation, offices, search houses, compounds and a wide variety of search routes. Vacant possession of an MOD agricultural holding had to be obtained by Land Management Services of Defence Infrastructure Organisation (DIO) prior to work commencing for the principle training area. Additionally enhanced training rights were obtained over a further area of farmland and various training rights were acquired over adjacent land in private ownership.

A key part of the project was the creation of a series of new 100m wide search routes covering several kilometres where trainees could search for improvised explosive devices. The creation of these search routes required the clearance of vegetation at two sites within Bicester Garrison. This included

areas of woodland and scrub considered suitable for dormice *Muscardinus avellanarius*. Dormouse nest tube surveys were conducted between 2009 and 2011 and two dormouse nests were recorded in 2010 and 2011.

Dormice are listed as European Protected Species under The Conservation of Species and Habitat Regulations 2010. This protects the animals themselves from killing and injury but it also protects their habitat and it is an offence to carry out work that will significantly affect the local distribution or abundance of the species. Due to their low population densities this can include impacts on relatively small numbers of animals. In addition, dormice are protected under the Wildlife and Countryside Act 1981

Monitoring the dormouse population at Bicester will continue for several years to assess the impact of the development



A dormouse bridge that links two areas of woodland over a track within a MOD training area © Mike Rennie

from disturbance, including the offence of obstructing access to any structure or place used for shelter or protection. This legislation placed significant constraints on the development of the DEMS search routes at Bicester, which would inevitably result in the loss of some habitat and fragmentation or modification of the remaining habitat.

The dormouse is declining in Britain with the most recent population estimate at approximately 45,000 individuals. There has been a significant decline during the last 100 years with a 64% fall over 25 years up to 2002. The species has a widespread, but patchy, distribution in the UK with most populations being found in south and central England and in Wales. The species is now found in approximately 50% of its former range.

Dormice have a highly arboreal lifestyle and were previously thought to descend to the ground rarely except to hibernate or occasionally to collect nesting material. Hence, they require continuous or well connected scrub or woodland habitats to survive. Dormice also live at low population densities; in early summer densities are between

approximately 1.75 and 5 adults per hectare in suitable habitats. Loss and fragmentation of suitable habitats is thought to be one of the main causes of the decline in the national population and it may be the major factor controlling distribution in southern Britain.

Once the impacts of the DEMS search routes on dormice were assessed by MOD in-house ecologists and consultant ecologists it was clear that the project could only be carried out under a European Protected Species licence issued by Natural England. In order to compensate for the loss of habitat some areas of additional habitat would have to be created or enhanced. Given the constraints of the site this was difficult to achieve but after detailed discussions between the Army, DIO, Carillion Enterprises (contractor), Thomson Ecology (ecological consultants), adjacent landowners (including the Ministry of Justice), tenants and Natural England a detailed mitigation scheme was agreed.

The enhancement of habitat on private land surrounding the site was central to the project. DIO carried out

negotiations with these landowners and put in place long term agreements that allowed coppicing, hedge laying and other woodland managements operations to be carried out on their land as mitigation for the development. Mitigation within the training area included extensive woodland planting, thinning, ride widening, hedge planting, dormouse bridges and the erection of dormouse nest boxes. Also, some dormouse bridges were erected at a height of about seven metres across existing tracks to connect two blocks of woodland.

Crucially the design of the search routes was also modified to minimise habitat loss and maintain connectivity between patches of woodland and scrub wherever possible. This was achieved by maintaining corridors of unmodified habitat and only removing the lower branches of mature trees to provide lines-of-sight across the search routes for the trainers and trainees.

Monitoring the dormouse population at Bicester will continue for several years to assess the impact of the development. This will include downloading from cameras installed on the two dormouse bridges, inspecting nest tubes in the retained woodland and checking dormouse nest boxes in habitat outside the training area. The habitat improvements will also be monitored and a second phase of coppicing is due to take place in 2020. In addition there will be regular checking of the 400 dormouse boxes.

The DEMS search routes project has now been delivered and despite the significant constraints imposed by the legally protected dormice it is providing a first class training facility. Thanks to excellent partnership working to deliver the mitigation scheme the outlook for the dormice in this part of north Oxfordshire is looking good.

Thanks must be given to the following people who have assisted in compiling this article, Michael Russell, (LMS DIO), Olly Howells, (DIO Ecologist), Mike Rennie, (Thomson Habitat) and Major Robin Hall, (RSME).

Tim Ashley-Smith

Senior Estates Surveyor, Aldershot
Defence Infrastructure Organisation

Daniel Atter

Principle Ecologist Thomson Ecology



Clear felling of ash and silver birch and hazel coppicing on third party land © Mike Rennie

The National Army Museum



Medical assessment of an Afghan national, Camp Bastion hospital, 2009 © Matthew Cook

Standing beside Sir Christopher Wren's glorious Royal Hospital Chelsea building, home of the famous Chelsea Pensioners, is the National Army Museum.

Britain's only museum to cover the whole history of the land forces of the Crown, takes the story from the Cromwellian New Model Army through to today's professional force, including all Commonwealth units and the Indian Army - with the latter's East India Company antecedents - up to their independence.

Besides the museum's coverage of the wars that made the British Empire and the world conflicts of the twentieth century, the NAM provides a social history of soldiering, looking at the other elements of the military experience, such as training, regimental life, families and veterans. It also aims to show how, through the Army, 'British culture, traditions, language and values

were exported across the globe, and global influences were brought back to Britain'. The museum is committed to relating the story of the Army's present activities, with a track record of thought-provoking exhibitions covering recent conflicts, from Operations Banner to Herrick. The latest of these, 'Unseen Enemy', tackles the history of Improvised Explosive Devices (IEDs), but focuses predominantly on their more recent use in Afghanistan.

Unseen Enemy

With the support of the MOD, the Army and, in particular, specialists from the Explosive Ordnance Disposal (EOD) and medical communities, 'Unseen Enemy' looks at how the Army has responded to this increased threat. Through artefacts and equipment, film footage, art and photographs, the exhibition shows the potentially historic importance of recent innovations associated with the work of the counter-IED community, as well as significant medical and surgical advances, some of which are already benefitting civilian society. But this exhibition is also about people, the individuals engaged in dealing with IEDs. From their own testimony and

personal items, the dangerous experiences of these soldiers are brought to a wider audience - from those who make up search teams, not forgetting the Military Working Dogs, or who work in disposal roles, as well as the medics and all those providing aftercare and rehabilitation to soldiers affected by IEDs. At the heart of this important exhibition lie the compelling stories of the individual soldiers tasked with carrying out these duties on the ground.

The exhibition also looks at the determined and resourceful enemy undertaking this debilitating form of warfare, their motivation and methods, and displays examples of insurgents' weapons and equipment, including a locally adapted AK47.

As the Army prepares to withdraw from Afghanistan, 'Unseen Enemy' serves as a fitting legacy to those who have given their lives in the course of duty and pays tribute to the bravery and professionalism of those who, on a daily basis, have dealt with the detection and the awful consequences of IEDs. It also looks at the impact of the conflict on that country, and the work of training the Afghan people to deal with the many devices that remain.

'Unseen Enemy' runs from 19th July 2013 to 31st March 2014 at the National Army Museum, Royal Hospital Road, London SW3 4HT, admission free.

www.nam.ac.uk/exhibitions/special-displays/unseen-enemy

Jenny Spencer-Smith
Collections Content Manager
National Army Museum

Formerly the museum's Head of Fine and Decorative Art



Training members of the Afghan National Army (ANA) to disarm devices manually © Chief Petty Officer Kevin Amaira, RN

The importance of Plain puddles



Adult common toad *Bufo bufo* rarely seen on Salisbury Plain © Iain Perkins

Salisbury Plain Training Area (SPTA) is the principal military training area in the UK and also the largest chalk grassland in North-West Europe.

It is recognised as an important site for species and habitats of conservation concern and in recognition of its importance about 20,000 hectares of grassland has been designated as a Site of Special Scientific Interest (SSSI). It is also a Special Protection Area (SPA) for birds under the EC Birds Directive and a Special Area of Conservation (SAC) under the EC Habitats Directive.

Historically, Salisbury Plain has been occupied and grazed since the Neolithic and later in the 17th and 18th centuries immense flocks of sheep roamed the Plain. Over the last one hundred years, due to military presence, it has largely escaped intensive farming, untouched by herbicides and pesticides, and development; factors which have allowed species to persist here which have declined in many other areas.

Salisbury Plain (West), also known as the Warminster Ranges, is predominantly used for tactical dry

training exercises often supported by heavy armour e.g. tanks that form corrugated tracks containing a series of ephemeral puddles, or temporary ponds.

Despite the porous chalk substrate these temporary ponds persist due to vehicle puddling and ground compaction, and account for approximately 99% of water bodies across the West. These range in size from a small wheel rut (4x0.5x0.3m), atypical 'H-Shaped' (5x4x0.5m) to large 'tank scoops' (8x5x1m).

Not only do the ponds provide a food source and watering holes for birds and larger mammals, in an otherwise arid environment, two recent surveys have confirmed just how important these habitats are.

The first, focused on fairy shrimp *Chirocephalus diaphanus* presence and absence on a landscape scale, as a section of a BSc dissertation. Over 300 ponds were identified containing fairy shrimp, in comparison to another stronghold, the New Forest, that has less than ten. Other species identified were; stoneworts, newts (smooth and great crested newts), diving beetles and dragonflies including the nationally scarce, scarce blue-tailed damselfly *Ischnura pumilio*.

The second, focused on common toad *Bufo bufo* breeding ponds, identifying over 250 ponds and aimed to assess

their success rates. This species generally prefers large permanent water bodies; however, the 'Plain toads' exist under more unpredictable conditions, for example, in 2012, the ponds dried out between March and May and a second spawning occurred. The second spawning however, was in fewer ponds but as they remained wet for long enough the tadpoles successfully emerged as toadlets.

Conversely, the excessive rainfall from May 2012 enabled the ponds to remain wet through to late July 2013, providing the tadpoles in the larger water bodies a greater chance to successfully become toadlets. Although this still only represented a 15% success rate, it illustrates just how much these toads are governed by weather conditions in this particular landscape.

Even with such high numbers of tadpoles, actual sightings of adult toads are extremely rare.

The studies concluded that the high density of temporary ponds makes Salisbury Plain one of the most important areas for fairy shrimp metapopulations in the UK and as breeding ponds for the common toad regionally.

As both species are features of the Salisbury Plain SSSI citation, these voluntary studies now inform mandatory management plans by indicating their range and distribution and outline the essential role disturbance from training activities plays in maintaining and creating new habitats.

Iain Perkins

Conservation Officer and member of the Imber Conservation Group
Defence Infrastructure Organisation



The author sweep netting a temporary pond
© Iain Perkins

MODern Housing Solutions adds value to Didcot community garden



Didcot community garden in August © Rosie Brown

The social and therapeutic benefits of gardening and getting involved in nature are well documented. Gardening and being outdoors helps people to connect and families to engage with one another.

It strengthens relationships, reduces stress and improves well being through physical activity. So for the Service community in particular, gardening is a perfect antidote for the stresses and strains caused by long periods of separation and the impact of operational duties on families. In fact, at Headley Court, injured Service personnel are encouraged to garden to aid their recovery.

A series of chance emails last year meant that MODern Housing Solutions (MHS), who provide housing maintenance services on behalf of DIO for Service Family Accommodation in England and Wales, became aware that the BBC 2 Gardeners'World production team was looking to film the creation of a Service community garden. MHS, through its existing countrywide programme of community projects, knew that 11 Explosive Ordnance Disposal (EOD) Regiment at Didcot had recently acquired a new welfare house with outside space, perfect for such a garden project. MHS was keen to help the families accomplish their vision of a vegetable and flower garden; by linking the BBC production team and the unit, the vision became a stunning reality.

In March 2012, a collaborative design for the garden evolved from the horticultural expertise of the BBC team, the MHS landscape manager and the families' ideas for the type of garden

they wanted. It was then time to get our hands dirty.

MHS provided over 200 railway sleepers, several tonnes of compost and an army of helpers. These raw materials were then used to create 17 raised beds, which were an essential part of the design.

MHS staff joined forces with families and unit staff to complete this particularly arduous task, transforming the area ready for serious gardening. MHS gifted gardening tools, seeds, strawberry plants, seed potatoes, herbs and seed trays. A generous timber donation provided an enterprising soldier with the raw material to build a number of bird boxes, whilst the remainder was used for building additional sweet pea beds.

The MHS community projects manager ensured that throughout the filming cycle from March to August, the



The plot as a blank canvas © Rosie Brown

families, unit welfare staff, MHS staff and the BBC worked in concert. The BBC's production team came with a wealth of gardening expertise ensuring that families and MHS staff received an excellent education in plant feeding, organic methods of keeping aphids at bay; as well as valuable advice on the flowers and vegetables best suited for the garden and the families' needs. A gardening notice board, complete with rotas, was set up in the welfare house to keep the families up to speed on all activity in the garden; ensuring that they keep on top of watering and weeding. A Facebook project page provided an excellent tool for keeping everyone in touch and (when needed) instant 'hits and tips' from the BBC Gardeners'World experts.

11 (EOD) Regiment has suffered significant losses and injuries over the past few years and the summer of 2012 was going to be particularly testing for unit Serving personnel and their families. The already heavy workload associated with UK and operational EOD duties increased dramatically with the requirement for their services at the Jubilee and Olympic celebrations. With all summer leave cancelled, the distraction provided by the gardening as a stress reliever and the excitement of having the glamorous Rachel de Thame as the lead BBC presenter, came as a welcome relief.

The children enjoyed hours of fun helping to sow seeds (with wild abandon), watering (normally each other) and as the summer months progressed the families involved

became one very happy community, focussed on a common cause. As the early shoots in the garden grew into beautiful flowers and the vegetable shoots produced potatoes, courgettes, rocket and marrows (amongst other things) so too did the relationships between individuals, children, the BBC and MHS. The sense of community was very evident and the support network for these families (who have gone through a tremendous amount over the past few years) strengthened. Wives supported each other, looking after each others' children, helping with school runs, collecting bunches of flowers to take to each other if they needed cheering up and using the plentiful garden produce to create family meals.

"The energy that MHS has put in to the garden project has been immense. The guidance and raw materials from MHS have allowed an opportunity for families to achieve a real sense of satisfaction and the Barracks as a whole is benefitting from the investment. The opportunity to be nominated as a potential resource for a BBC Gardeners World programme and the professional assistance that comes with it is all attributable to MHS. With their support, knowledge, and community spirit we have a real chance to create something special and enduring".
Lt Col Adam McRae MBE, Commanding Officer, 11 EOD Regiment.

MHS, the BBC production team, unit staff and the families involved in the Didcot Community Garden project hope that the BBC2 Gardeners World coverage will inspire other Service

communities to create gardens throughout the Service community. MHS is intent on continuing its support to any community project they help to get off the ground. Recent work at Didcot has seen new fencing installed to create a nature area opposite the community garden, with the aim of encouraging hedgehogs and birds to make their homes here; in turn this should help to keep pests at bay in the garden. The original Didcot project team's vision is turning into reality as the news of the Didcot garden spreads. MHS has been approached about helping to set up similar ventures at a number of Service units, including RAF Leeming, Pirbright and Warminster.

Further information on the project is available at: You Tube under 'Cut Flower Arranging on Gardeners'World' and on Facebook under 'Didcot Garden Project'.

Rosie Brown

Play Parks and Community
Projects Manager
MODern Housing Solutions

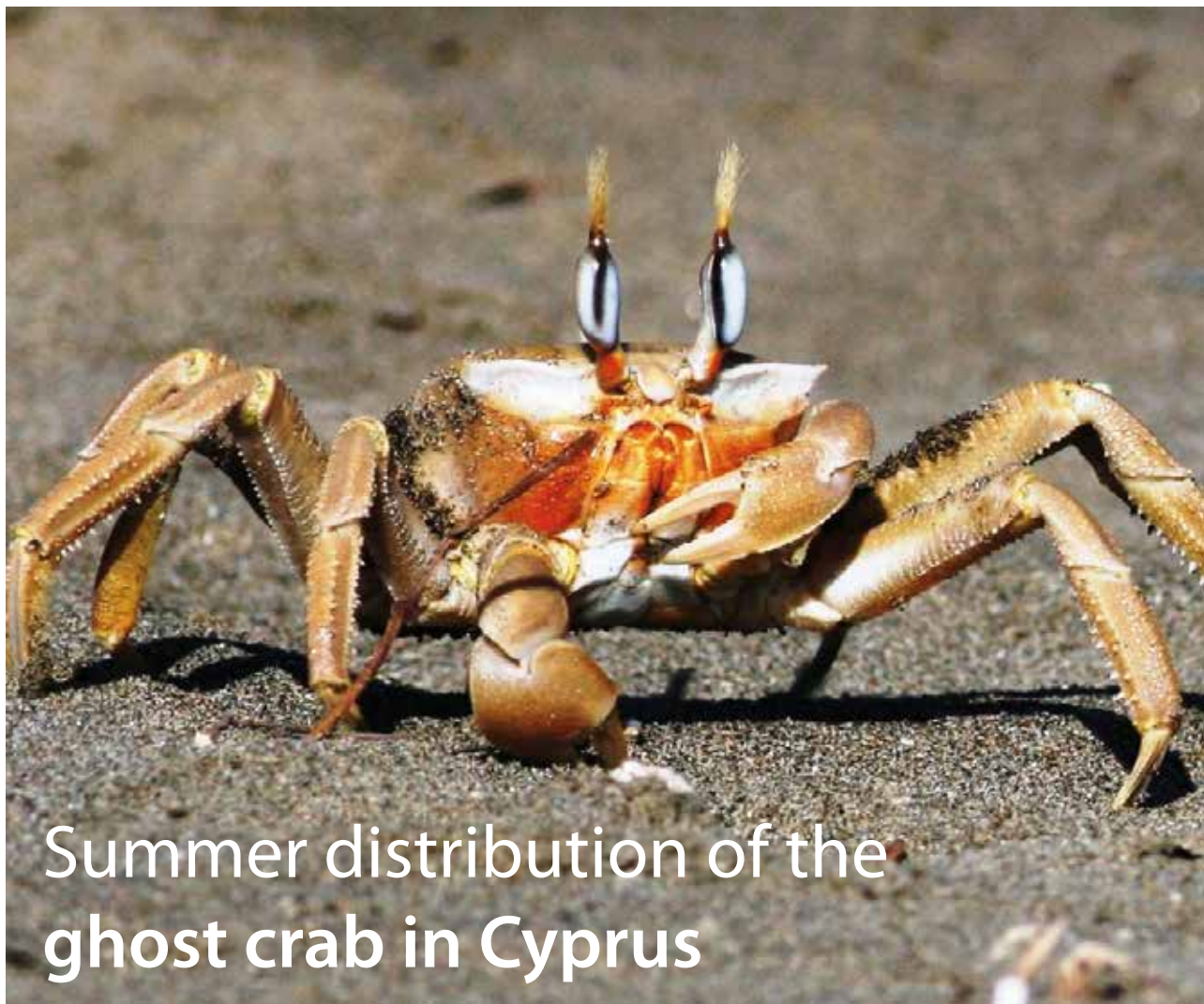
Responsible for managing all DIO Housing play parks in England and Wales and managing the MHS countryside programme of community projects and volunteering.



Garden in May © Rosie Brown



Garden in July © Rosie Brown



Summer distribution of the ghost crab in Cyprus

Ghost crab *Ocypode cursor* (L., 1758) along the east coast of Akrotiri Peninsula in Cyprus © Nicole Mavrovounioti

Investigating the distribution of ghost crabs along the east coast of Akrotiri Peninsula, within the Sovereign Base Area (SBA) of Akrotiri.

The study, part of a BSc in Environmental Management at Northumbria University, took place during the summer of 2012 and covered numbers and sizes of crabs in relation to ecological variables and the impact of human activities. This research was facilitated by the RAF authorities, the SBA Environment Department and the Akrotiri Environmental Education and Information Centre.

Ghost crabs *Ocypode cursor* (L., 1758), are a protected species and an important element of the coastal ecosystems of Akrotiri Peninsula. They are a semi-terrestrial species and, as the most evident invertebrates of sandy shores, can be used as an indicator of human impact on the coastal ecosystems. Ghost crabs are swift and highly active predators, scavengers and sometimes deposit feeders. They are more active during night hours when they emerge from their burrows to maintain the burrows or to forage. Burrows protect them from predation, allow them to breathe air and provide them with moisture and a stable temperature against extreme high and low temperatures on the surface. The common name of the species comes from their sandy camouflage colour and evasive, ghostly appearance and movements on the sand.

Their periscope-shaped eyes provide them with very acute, 360° vision.

The research included counting of burrows (as an indication of the crab population) and their distances from the sea, measuring the diameter of burrows, the humidity and granulometry of the sediment, the environmental and sand temperatures and estimating human disturbance. The study area was divided into two parts. The first was the popular, open access area of Lady's Mile and the second, an undisturbed, fenced area within RAF Akrotiri.

Burrow numbers varied during the study period, July being the highest and August the lowest, but with no statistically significant differences between the three summer months. The sizes included mostly small and

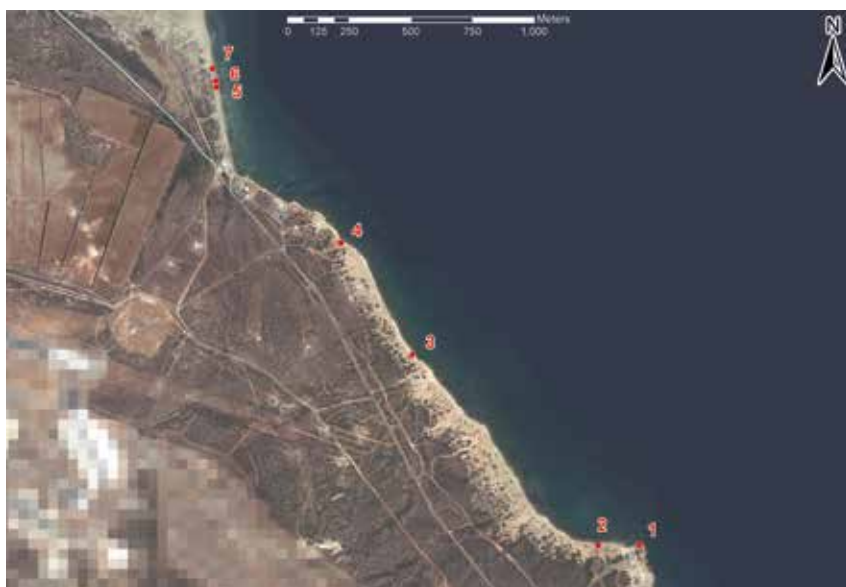
Ghost crabs are swift and highly active predators, scavengers and sometimes deposit feeders.

medium diameter burrows. The most populated area was established between 0-10m from the sea with the peak at 6m. Also, it was established that larger size burrows (and crabs) were distributed further away from the sea. In addition, a strong negative correlation between the number of burrows and man-made disturbance on the beach was confirmed, with significantly more burrows in the southern, undisturbed part within RAF Akrotiri than the northern, open access part. The sand moisture across the most

populated area of *Ocypode cursor* was between 11 and 20.5%. Similarly, the sand surface and sediment column temperatures of the preferred areas ranged from 22°C to 46°C and 27.2°C to 36°C respectively. The sediment column was found to be providing the burrows with a thermally stable environment (28.5-34.4°C) insulating crabs against surface temperature extremes (23.5-46.1°C). The distribution of *Ocypode cursor* was found to be covering both coarse and medium sand grain, without a clear preference for either.

These findings can be used to inform the management of the beach, with a clear direction towards minimising human disturbance for protection of the species and the wider coastal ecosystem. Further recommended research includes studies of the wintering habitat of the species, which could well be under threat from various activities.

Nicole Mavrovounioti
BSc student
Northumbria University



Quickbird imagery sourced from the Defence Geographic Centre © Crown



Author conducting fieldwork © Nicole Mavrovounioti



Photogenic ghost crabs © Nicole Mavrovounioti

Mountain Rescue Search Dogs training at Garelochhead Training Camp



Handler Liz Outram and dog Feilan being winched © SARDA Southern Scotland

The Search and Rescue Dog Association (Southern Scotland) comprises a group of people involved in the training of dogs to search for missing people.

The handlers are volunteer members of a recognised mountain rescue team and backing up the handlers is a dedicated group of volunteers, who act as 'bodies', lying out in the countryside, in all weathers, for the dog teams to find. Handlers and bodies come from various backgrounds; including teaching, nursing and forestry to vets, social workers, researchers, the Police, outdoor instructors and those lucky enough to be retired.

The Search and Rescue Dog Association (SARDA), was envisaged and inaugurated by Hamish MacInnes in Glencoe in 1965. The dogs are classified as 'air scenting wilderness search dogs' and are trained to search for any human scent given off from either an article or person. The Association has evolved and developed into an internationally recognised group of volunteers spread throughout the British Isles. It was, originally, a mountain rescue organisation, but many Police Authorities throughout the UK, quickly, recognised that the skills of the dog teams could be deployed in situations other than the mountains and wild country.

By 1979, because of geography and increasing numbers, the original Association had divided into Scotland, England, Wales and N. Ireland. In 1997, most of the groups co-operated to

form the National Search and Rescue Dog Association (NSARDA) to raise the public's awareness and use of search dogs. There are nine Associations throughout the British Isles that subscribe to NSARDA standards. In 1983, SARDA Scotland divided into two Associations: - Highland (now known as Scotland)) and Southern Scotland.

SARDA Southern Scotland has dog teams, both qualified and trainee, based from Aberdeen and Fort William in the North, to Galloway and the Scottish Borders in the South. We train one weekend per month throughout the areas where we are 'first on call'. We are now used by the Police to search for missing people in a variety of terrain, from high mountains, to open moorland, forest both planted and natural and public areas such as footpaths, river banks, shorelines, industrial estates and public parks.

In order to be able to work, with confidence, in such a variety of terrain, training involves exposure to the areas we are called to and the type of ground we might encounter. Training in the dark, using dogs in search lines and in areas contaminated by the general public, ensures that as soon as dog teams are qualified they are competent and confident enough to work any area to which they have been tasked.

Trainee handlers are assessed internally, but formally up to a level where they are able to search large areas of open hillside. They then undergo more specific training in lowland areas and parkland. A formal assessment in front of external assessors leads to the award of Lowland Search Dog. This puts the team on to the callout list to be used in urban surroundings, semi-rural, moorland, woodland, water margins and tracks.

After further training the team can opt to be assessed for Mountain Grade Search Dog. To achieve full mountain status the team has to demonstrate, to external assessors, their ability to search steep ground containing every type of obstacle that might be encountered in the mountains, e.g. crags, gullies, streams, boulder fields and snow. They will also have had avalanche training. Success at this level involves a minimum of 30 hours assessment and teams are re-assessed every three years. Currently, we have 8 operational mountain dog teams, 2 lowland teams and 3 trainee teams.

All SARDA Southern Scotland dogs, regardless of grade or status, are required to demonstrate their safety around stock by being tested annually under the impartial observation of a working shepherd. This is vital if we are to retain the confidence of the farming community.

We use the facilities at Garelochhead Training Camp on three occasions throughout the year and the Camp provides a central and easily accessible location for our members. There are usually about 20 people per weekend; comprising dog handlers and volunteer bodies.

The training areas provide us with most of the terrain we need and it is very near to the Clyde coast, the high mountains of the Arrochar Alps, and public spaces such as community woodland in Helensburgh and Balloch Park. No other venue, where we train, offers us this amount of variety. In addition, the helicopter pad and access to high ridges, such as the Strone, fulfils all we need for helicopter training. Nearby Loch Lomond allows us to train with the Loch Lomond lifeboat. An added bonus for us is the freedom to use smoke to increase our experience of how scent moves on the air in different weather conditions and terrain.

Finally, but not forgotten, are the camp staff, who bend over backwards to accommodate us.

NSARDA
www.nsarda.org.uk

SARDA Southern Scotland
www.sarda.org.uk

Search and Rescue Dogs
The remarkable story of search and rescue dogs from the mountains to the shore

Bob Sharp and Bill Jennison
Hayloft Publishing Ltd

Bill Jennison
Retired teacher

Joined mountain rescue in 1978 and qualified with his first search dog in 1981. He has trained and worked 3 search dogs. Since retiring his last dog he has been training officer with SARDA Southern Scotland. He is an accredited assessor for NSARDA



Handler, Darryl Urquhart-Dixon with body John Chroston and dogs Ruby and Dochas. Winter training.
© SARDA Southern Scotland



Body Joanna Toohey and dog Angus © SARDA Southern Scotland

Newtown Rifle Range and Training Area Osprey Project



The majestic osprey *Pandion haliaetus* © Dave Kjeear

The Newtown Rifle Ranges and Training Area is situated within the SSSI of Newtown harbour, Isle of Wight, which is a designated National Nature Reserve comprising of approximately 1,690 acres; the Ranges and Training Area covers some 830 acres.

The first record of an osprey *Pandion haliaetus* at Newtown, in modern times, was in 1962; since then, and particularly within the last 15 years, this wonderful bird has become a more regular visitor, on passage to or from West Africa where they spend winter. Up to five have been recorded.

The osprey became extinct, as a breeding bird in England, during the 1840s and in the whole of Britain in 1916. By 1954, they had recolonised

naturally, initially in Scotland at Loch Garten and by 2001 there were 198 pairs breeding in Britain.

In 1996, Mr Roy Dennis, the noted world expert on ospreys, ran a translocation project for six years, where chicks from Scotland were moved to Rutland Water and released as fledglings. In 2004, a young returning female released at this site bred for the first time utilising an artificial nesting platform and now several pairs breed at

Rutland Water, raising a total of 10-12 chicks annually. Whilst on a visit to Rutland Water, the team leader of the Osprey Project, Tim Mackrill, was very enthusiastic about our efforts, informing us that as well as birds ringed at nest in Scotland it was highly likely that Rutland birds (identified by colour rings on the right leg) would also stop off at Newtown.

True to its nick-name, the 'mullet hawk', love to feed on the plentiful grey mullet, plus the odd bass or flounder when at Newtown. The adults need to catch up to six pounds of fish a day to feed their family, which is why a plentiful supply should be readily available. An adult female with her five and a half foot wingspan can weigh up to three and a half pounds with the male being slightly smaller.

So, here at Newtown an ideal opportunity awaits us to encourage the osprey to breed, an estuary that abounds with fish, and a relatively undisturbed open habitat provided by the ranges. The Newton Range Conservation Group is very active and carried out some research into the feasibility of the project. The first step was to contact Roy Dennis who, using 'Google earth', thought the site ideal. He sent down photographs of his metal nesting platforms, stating they would need to be fixed on top of 30 foot poles, which in turn needed to be buried five foot into the ground. Because ospreys are semi-colonial breeders it was thought that three platforms would be more favourable.

Roy agreed to select suitable positions for the poles, and with the support of Scottish and Southern Energy (SSE) who agreed to supply the three poles and erect them, only asking for limited 'in house' publicity in return.

In November 2011 at our AGM the proposal to attract breeding ospreys was enthusiastically accepted by the conservation group members and tenant farmer. We now had to convince Natural England that we were serious about the project and get permission to go ahead. Once they had the details

Young ospreys usually do not return to Britain until at least two years old and make their first breeding attempt between three and five years.

they had no hesitation in granting the necessary paperwork for us to continue. Later in November, Roy Dennis visited the range and advised the best positions for the poles. The platforms were made by a local engineering firm for a good price. By Christmas the poles were delivered to the range; the nests were made and fixed to the platforms and in March 2012 we were all ready to go. At that time we were in a long dry spell and with seemingly only a matter of days before erection, the dreadful weather intervened and it was not until September when SSE felt the ground was dry enough for their heavy machinery to be on site.

The day (12th September) dawned dry and sunny, the convoy of lorries and machinery left the Range house at 1015hrs and the SSE engineers, assisted by all the Range staff, had the first pole in by 1130hrs. They made it look so easy. We then drove to the second platform and it was there that we had no less than three ospreys circling as spectators, which was wonderful. Whilst at the last site an osprey was spotted sitting on a post about 100 yards away eating a large bass, not in the least worried about us. In fact Major Maidment, the Range Officer and Training Estate Manager, crept down and took photos. At 1515hrs, the task was finished. All agreed that it had been a truly remarkable day, one to live forever in our memories.

Young ospreys usually do not return to Britain for at least two years and make their first breeding attempt between three and five years. Our hope is that our breeding poles will attract a visiting young male who in turn will attract a young female and commence breeding. It might not happen but it will not be for the want of trying.

John Willmott

Ornithologist

Newtown Range Conservation Group



The proud team © Dave Maidment



The 'mullet hawk' in action © Dave Kjeaar



First in line for the new des-res © Dave Maidment



The Scottish and Southern Energy team at work © Dave Maidment

When wildlife meets the military, both benefit



Roasting marshmallows in the woods © Ryan Tabor Wiltshire Wildlife Trust

Wiltshire Wildlife Trust is a membership organisation with a vision for a sustainable future for wildlife and people, including the military communities around the county.

Building a sense of community for Wiltshire's Military families

Using nature and the outdoors as a catalyst to provide military families with a sense of community, Wiltshire Wildlife Trust runs There Is Space Here (TISH) and Generation Plain to offer families and especially children the chance to make memories.

Salisbury Plain is an incredibly special area, an ancient sweeping expanse of chalk grassland with an historic connection to the Military. Funded by

the Armed Forces Community Covenant Fund, Big Lottery Fund, The Community Foundation for Wiltshire and Swindon and The Walter Guinness Charitable Trust; Generation Plain focuses its activities around Salisbury Plain. The aim is to integrate military and civilian communities and build a more and sustainable community in the Bulford Barracks area based around the Kiwi Primary School. The project is run by Susan Allen, who organises events and outings for local families with a particular emphasis on children.

Generation Plain provides children with a chance to play outdoors. Sounds simple enough, but with the trend towards play meaning sitting in front of a television or games system, it is harder than it appears. Outside play develops a sense of place and teaches children to love where they live. The Trust encourages children to be children and helps parents to provide traditional childhood treats and outings. That means getting wet, dirty and occasionally, even muddy! The project is about being outdoors; climbing trees, building dens, pond dipping, bug hunting, and learning traditional crafts like willow weaving and creating artwork from nature.

Generation Plain is very much about families and organises events to give Mums a chance to get together to learn new skills, such as the popular Knit and Natter sessions. To give families the chance to get outdoors together, Generation Plain also organises Out and About days with bus trips to the Trust's nature reserves, such as The Devenish, where there is plenty of room to run around and even more wildlife to learn about. Events are free of charge and open to military and non military families, providing both with the opportunity to make new friends, and be part of the local community.

There Is Space Here, or TISH as it is affectionately known, has its own, unique approach to getting families outdoors. It often works alongside Generation Plain, to provide a broad range of nature based activities for families, and training for community groups to encourage them to run their own events. TISH is funded by Natural England, the Big Lottery Fund, the Army Welfare Service and the Underwood Trust and works with schools in the military towns of Bulford, Tidworth, Warminster and Larkhill.

Sadly, funding for the project is now coming to an end but to date; over 4,000 local people have participated in a TISH event. They've come along to our Wildplay Days, built dens and cooked on camp fires, learned mud painting, pond dipping, willow weaving

and gone mini-beast hunting with Trust staff and volunteers. TISH has even taught youngsters and their parents, how to grow their own fruit and vegetables. During the school holidays, TISH has run events at the Trust's nature reserves for families to come along either with TISH staff or with downloadable spotter sheets, to enjoy a day outdoors while learning about the wildlife around them.

Woodland Warriors, where wildlife meets our military heroes

Two charities, with very different remits, combine forces to create and manage a natural environment fit for heroes.

The most recent of Wiltshire Wildlife Trust's military projects is Woodland Warriors, working with the national charity Help for Heroes to help wounded service personnel in their recovery. This unique project brings together expertise and experience to provide a variety of benefits to wounded military men and women.

The Trust is managing the creation of a camp in the 26 acres of woodland surrounding Tedworth House Recovery Centre which will provide recovering service personnel with an outdoor space for relaxing and finding inspiration.

The camp also provides residents with the opportunity to learn practical skills, traditional crafts and building techniques. The Trust has already provided chain saw training to several residents and is planning to expand the range of training opportunities it can offer leading to qualifications and experience that can provide residents with career prospects outside the military.

As well as building the camp, the Trust will be putting in quiet areas where residents can get away from the stress of their recovery. National research demonstrates the value of access to nature as an important tool to helping those experiencing mental health issues such as stress, anxiety and depression. The Trust's Wellbeing Team are experts in using the natural environment to combat such issues. The Wellbeing programme teaches skills such as tree felling, coppicing, hedge building and construction, as well as habitat surveying. These skills

can lead to recognised qualifications in conservation and provide career opportunities for those leaving the military. They also teach traditional crafts like woodworking and whittling. Participants can learn to make spoons, bowls, baskets and sculptures.

In the gardens of Tedworth House, the Trust's Food Champions staff will be helping to build raised beds accessible to all residents to learn growing skills. These beds will not only provide residents with new skills, a chance to get outdoors and do physical activities, but longer term it will provide fresh fruit and vegetables for the residents.

As part of the Woodland Warriors project, local people and businesses are encouraged to come along and help to build the camp and work alongside the residents as a practical and meaningful 'thank you' to those wounded in the service of their country.

Kelly Barnett
Senior Communications Officer
Wiltshire Wildlife Trust



Trees are fun! © Wiltshire Wildlife Trust



Heroes learning coppicing skills © Wiltshire Wildlife Trust



Wood carving helps those suffering from mental health issues © Wiltshire Wildlife Trust

Veteranisation of trees

Planning for the preservation of rich habitats whilst maintaining a safer environment



Veteranisation of a horse chestnut tree © Aspire Defence

Aspire Defence Services Limited (ADSL) manages around 35,000 trees and 307ha of woodland spread over 1,093ha as part of the Ministry of Defence's 35 year Infrastructure PFI contract, Project Allenby/Connaught (PAC).

ADSL's tree surveyors are qualified arboriculturists and carry out regular inspections on all trees and woodlands across land at Aldershot and Salisbury Plain under the PAC footprint. Trees are assessed to check their overall health and any visual defects are recorded and addressed through planned maintenance.

Recent surveying has included the much publicised and feared tree disease Ash dieback *Chalara fraxinea* which causes leaf loss, dieback and usually the death of ash trees. As at 18th March 2013 there were 413 confirmed cases found across the UK. The disease is thought to have entered the UK via infected imported plants as well as wind dispersal across the Channel. A Plant Health Order has been in place since 2012 preventing imports of Ash until further notice, but the worry is that this disease will decimate ash tree populations in the same way that Dutch elm disease destroyed our elms. However, some ash trees growing near infected trees seem to show natural genetic resistance.

There was good news in March 2013 when it was announced that Forest Research, working as part of a consortium, had been awarded £2.4m

research funding to develop an in-depth understanding of the ash dieback fungus and to provide genetic clues about some ash trees' natural resistance to attack.

ADSL are pleased to report that no evidence of the disease has been found on PAC sites so far, but we will continue to monitor the situation; hopefully, avoiding losses and ensuring the wellbeing of our future veteran ash trees.

In most cases, veteran trees can be said to 'grow old gracefully' meaning that their speed of growth naturally reduces with old age. This enables them to survive longer than others of the same species. The activity of wood digesting organisms causes features such as hollows, decayed wood and water pools to develop; these create additional micro ecosystems and unique niches for many species of flora and fauna. At the same time the natural degradation of structural wood properties weakens the tree and large limbs will be dropped or the whole tree may fall, sometimes with little warning.

ADSL tree surveyors identify tree related hazards and if the risk assessment suggests there is potential for harm to human life or infrastructure then action must be taken. This will mean either removal or reduction of the hazard and the team will plan this work in sympathy with the wider environment, or we may move or redirect persons or property away from the defective tree rather than working on the tree itself.

In recent years, it has been recognised by national organisations, such as the Forestry Commission, that there is a lack of decaying wood habitat within Britain's woodlands - there was a perception that dead wood in trees would harbour disease, however, these habitats sustain many species that are important to conservation. Historically, both arboricultural and silvicultural practices focussed on cleaning out dead wood from trees and woodlands believing this to be good practice, protecting the timber resource and reducing potential hazards in them.

Today, the importance of making provision for decaying wood is more widely accepted. Conservation bodies, such as the Ancient Tree Forum and Natural England, have widely publicised the need to maintain the biodiversity

associated with dead wood. In response, the ADSL tree team have adopted the technique of veteranisation, which aims to quickly replicate some of the morphological changes that would normally occur over a considerably longer time.

The methods ADSL have used to date include:

- Creating dead wood piles which benefit ground inhabiting species
- Creating monoliths by making dead or dying trees safe, removing all the branches and reducing the overall height
- Retrenchment which severely reduces the crown to create a smaller, less hazardous defective tree
- Ring-barking which ensures tree death and speeds dead wood formation to support habitat development
- Stabilising major dead wood rather than removing it entirely thus leaving safe aerial habitats
- Natural fracture pruning and coronet cutting, which mimics the way that tears and fractured ends naturally occur through storm damage for example. This creates microhabitats that will collect water and debris, which is then colonised by micro-organisms

Benefits of veteranisation include the retention and creation of habitat for important wood decay fungi which live and thrive on dead wood. Many species of bird, insect and fungi need the resources that dead wood provides and some species would become extinct if no dead wood was available to them.

Different species will use dead wood in different ways; some will only use it while it is attached to the tree, high up in the canopy; once the wood has fallen to the woodland floor a different species may take over.

As the dead wood breaks down within the leaf litter valuable nutrients are returned to the tree through the soil. This is an important natural process which is not usually available to urban trees. Whilst mulches can be put down around the tree these do not provide the richness of a woodland floor.

Invertebrates dependent on dead wood at some time in their life cycle include species of worms, snails,

millipedes, centipedes, spiders, mites and numerous insects. Birds also benefit from the process of natural decay as woodpeckers feed on dead wood insect larvae, and tawny owls and nuthatches use cavities in tree trunks for nesting or roosting. Several species of bat also rely on veteran trees for habitat.

At ADSL our priority is to manage the PAC tree population ensuring safety at all times. In addition, we are privileged to be able to plan for preservation of rich habitats for the long term benefit of the estate and for future generations.

Martin Steele

Salisbury Plain Tree Surveyor
Aspire Defence Services Limited

Worked in the Arboricultural industry for 13 years, currently working for Aspire Defence Services Limited, responsible for circa 20,000 trees and 150 hectares of woodland across Salisbury Plain.



Completion of coronet cuts © Aspire Defence



Monolithised tree © Aspire Defence

Workhouse Archaeological Excavation Churchend Village, Foulness Island



Photograph of excavations in Area 1: showing a fireplace, South-East wall and clay level © Bob Crump

During the past years, the Foulness Conservation and Archaeological Society (FCAS) has undertaken a variety of archaeological excavations supported by historical research on Foulness, to study Romano-British Occupation, periods of land reclamation, and phases of building and domestic settlement covering the period medieval through to the nineteenth century. This work is part of an ongoing research project, which is aimed specifically at producing a comprehensive picture of life on Foulness over the past 2,000 years.

We became interested in the Workhouse site following the study of a map of Foulness, made in 1801 by John Grist for the Commissioners of Sewers and Seawalls. The area of interest on the map was recorded as 'The Encampment of The Rochford Hundred Volunteers'.

The Ale House Recognizances for Foulness record that an ale house licence was granted to Amelia Bennewith for 'The Rochford Hundred Volunteer'. This commenced in 1798. Amelia Bennewith was the wife of

Thomas Bennewith who held the licence for The George and Dragon, in Churchend Village.

In 1810, Amelia Bennewith sold a property to William Potton, who in turn sold the property on in 1824 to The Churchwardens and Overseers of The Parish of Foulness. This property can be clearly identified on the 1847 Tithe Award Map for Foulness as the 'Parish House'. This is, in fact, the area mentioned in 1801 as 'The Encampment of The Rochford Hundred Volunteers'.

We believe that the building was licensed as an ale house during the Napoleonic War to provide for the Volunteers who were based outside the Churchend Village.

Our objectives, were to locate the foundations of the building to establish evidence for the earliest occupation and its role in the community; to establish a link with the local Militia and equally as important, its function as the Parish House.

We commenced the archaeological excavation in February 2008 and worked through until mid-April 2008, when we left the site to allow a settled period for the flora and fauna. During the above period, we were able to uncover the complete brick foundations of the large building mentioned in the introduction. The brick sizes suggested we were dealing with a structure of early-to-mid c1800s. The depth and width of the brick foundations suggested that the structure above ground level would have been timber framed. We have identified six ground floor rooms, and a probable outshot (see plan).

The Foundations are located on silty clay at a depth of 18 inches (46cms), which at the time of the excavation was very firm. For the purpose of recording the find location, we designated the rooms, Areas 1-6. In general, the majority of the ceramics recovered were mid-to-late Victorian; however, we did recover some Staffordshire Slipware c1800s, and post-medieval red earthenware with a date range between 18th - 19th century.

Plan of excavated foundations at the workhouse site



We began the excavation at the southeast side of the site, where we started to uncover the south and east wall foundations along with the base of a large fireplace in Area 1. Area 4 is clearly the kitchen; here we found the remains of a kitchen range.

The dateable finds so far identified are of significant interest for they have given us a broad insight as to what was taking place in certain areas of this building. Twenty-five clay pipe bowls have been recovered dating between mid 18th century to early 20th century. Twenty bone buttons were recovered with a date range of mid 18th century; most of these were found in Area 5, along with items associated with needlework, lace and crochet work. Metal, pearl, and later bakelite buttons were also found here.

Thirty-one coins were found with a date range from George II to George V 1918. One token was also recovered from Area 5 for a jeweller in Norwich; 'Newton Silversmith and Jeweller MDCCCXII'.

Two of the discoveries have left us with some interesting thoughts:

- The first is a military button, which is inscribed on the obverse: '62' within a French Circle and on the reverse:

'Jennens & Co London'. The origin of this button is the 62nd (Wiltshire) Regiment of Foot 18th century. This was found in Area 5

- The second is a Portuguese Coin, also recovered from Area 5, inscribed on the obverse: 'PORTUGALIAE ET ALGARBIORUM REX' and on the reverse: 'IOANNES V DEI GRATIA'. The coin refers to King John V of Portugal 1738 and on the obverse centre can be seen 'X' which refers to the coins value of 10 Reis

We were then left with the question of how these two items found their way to Foulness...

Following contact with the Essex Regiment Museum in Chelmsford, and The Rifles Museum in Salisbury, it was established that the Wiltshire Regiment had not served in our region.

One possible answer may be that during the Napoleonic War there existed on Foulness two semaphore stations, one at Courtsend Village and another at Burwood, to the south. These were part of the east coast semaphore/signal system.

We have documentary evidence that one of the officers, John Lundin, who was appointed by the Admiralty to serve at the Courtsend signal station,

had at sometime in the late 1700s served on the island of Santa Maria, which at that time was a Portuguese Colony.

We have suggested that Area 5 was used for needlework, could it be that the button may have come from the uniform of a former serving member of the above regiment, now a member of the local 'Volunteers'; and likewise, the coin deposited by someone who had served in the Portuguese Colony?

Our initial objective with this site was to discover evidence of occupation in relation to 'The Rochford Hundred Volunteers' and our knowledge to date is supported, so far, by:

Documentary evidence:

- The names of the Volunteers and the dates for muster, including Jonas Asplin who was the Captain of The Volunteers (he was a gentleman farmer from Little Wakering Hall located on the mainland)

Physical evidence:

- The metal top (brass) of a powder flask dated between late 18th century to early 19th century
- Three pieces of lead shot, two showing signs of impact that have



1847 Tithe map: showing the Parish House © Bob Crump

been identified as the type fired from a musket during the period of interest

- A button found in Area 1; thought to be local Militia, inscribed on the Obverse 'GR' beneath a crown, and on the reverse 'Wooley & Co Birmingham'
- We recovered part of a yard glass used to take a yard of ale and two metal hoops from a barrel, which were found adjacent to Area 1. We believe that this large room, with its large fireplace, may have been used as a social area for the consumption of alcohol

It would appear that this building, during its lifetime, has provided two roles in the community:

- Accommodation for the poor
- A place of rest and entertainment for the local Militia

Our post excavation research continues, however more questions have arisen so we must return to the site in the near future.

We have continued to record a further 200 items recovered from the area just South of the Workhouse, the location is adjacent to the site in the area recorded as 'The Meadow'.

The date range of all the finds is early 18th century to early 20th century. To understand how these items came to be located in this area we need to consider what has taken place during this period.

We know that a footpath was in existence, running from Eastwick Head via The Workhouse Site and onto Old Hall. We also know that the village fete was held adjacent to the Workhouse site (The Meadow), probably during mid to late 19th century until 1923, when it was then moved and held close to Old Hall.

We can relate the finds to those lost on the access footpath, and at the site of the fete; however, the most interesting discoveries suggest that we may have found the site that attracted us to this area originally, that is 'The Encampment of The Rochford Hundred Volunteers'.

The most exciting find to date is a 14th - 15th century Jetton, which is either of French or German origin. It was found on the track very close to the rear entrance of the Old Hall complex (the site where the Medieval Manorial Hall would have stood). Jettons were used for accounting purposes.

Only time will tell what other interesting finds will be discovered at the site in the future.

Bob Crump

Chairman
Foulness Conservation and
Archaeological Society and member of
Foulness Conservation Group



Military button © Bob Crump

New solar farms will save energy and cut bills for DIO



Photovoltaic arrays at Sennybridge Training Camp © Landmarc

In support of the DIO Energy Spend to Save Programme, Landmarc Support Services has worked closely with DIO Ops Training to install five 50kWp photovoltaic arrays on four camps across its training estate.

These are the first of their kind to be installed on the defence estate, which will generate electricity, cut bills and reduce DIO Ops Training's carbon footprint by an estimated 20 tonnes of CO₂ per year which will contribute to the Greening Government targets.

A photovoltaic array (often called a solar farm) is a linked collection of solar panels created to convert sunlight into electricity. An inverter is used to convert the DC power produced by the panels into an Alternating Current (AC), which then feeds into the camps' electricity distribution system. Five systems have been installed across the estate: two at Sennybridge and one each at Castlemartin, Lydd and Chickerell. Each installation is around 800m² in size and capable of generating some 50kWp in 'ideal conditions'.

The solar farms should virtually pay for themselves twice over during their lifecycle

The electricity generated will be used to support the future energy requirements of the camps. In addition, DIO Ops Training will benefit from the Feed in Tariffs (FITs) scheme. This is the UK government's main financial incentive to encourage uptake of renewable electricity-generating technologies. It means that approximately 13p per kWh could be paid from their energy supplier for all of the electricity that is generated, even if it is used by the camps. And of course, they will save money on their electricity bill, because they will be using their own electricity. If you couple this with a minimum life expectancy of the installations of around 20-25 years, the solar farms should virtually pay for themselves twice over during their lifecycle. This is in addition to the carbon savings benefit.

The Landmarc team project managed the installations, working with Ice Energy and Defence Infrastructure Organisation. This included managing planning applications across four Local Planning Authorities, two of which were National Parks.

In addition to the DIO's Energy Spend to Save Programme, the project also directly supports the DIO Ops Training Energy Conservation Strategy to reduce the amount of wasted energy; reduce the consumption of energy and switch to renewable energy solutions.

Mark Manning
Project Manager
Landmarc Support Services Limited



Photovoltaic arrays at Sennybridge Training Camp © Landmarc

Sustainability at the heart of a state-of-the-art PRIDE development



Aerial shot of the whole development at RAF Wyton © Crown

Sustainable development is recognised as an important contributor to the Defence of the realm and is one of seven Defence priorities, i.e., *“To deliver Defence in the most effective, efficient and sustainable way by, meeting benchmarking, efficiency and Government sustainable development targets, building on the Defence Reform Unit’s review”*. The state-of-the-art buildings now standing at Wyton are contributing to this.

The £308m Programme to Rationalise and Integrate the Defence Intelligence Estate (PRIDE) development at RAF Wyton involved the construction and fit-out of a suite of buildings to provide technical accommodation for Defence Intelligence (DI) units, which are being co-located in Cambridgeshire. The £155m Maximum Price Target Cost (MPTC) contract for the construction of the technical buildings was let in April 2009 providing the foundation for DI to transform the way in which it delivers its outputs. The PRIDE team worked closely with the Defence Infrastructure Organisation (DIO) project team, embedded consultants and the standalone prime contractor, Skanska (UK) plc, to ensure the handover of

Pathfinder building to DI was completed on time in January 2012. The remaining technical buildings was handed over to MOD in Spring 2013.

The DIO technical accommodation contract was forecast to complete within budget, ahead of time and to specification. As part of the programme work has been ongoing under Project Single Living Accommodation Modernisation (SLAM) to provide replacement accommodation blocks and messing facilities at Wyton. The SLAM deliverables are also forecast to deliver to time, budget and specification.

From the beginning of the planning phase the sustainable design approach was used. This was to satisfy the statutory requirements under Part L of building regulations and meet the 10% ‘in site renewable’ in site renewable under Huntingdon Council planning authority requirements. It was also to achieve a 10% improvement in CO₂ emissions over Part L requirements to achieve Defence Related Environmental Assessment Methodology (DREAM) credits.

In order to select the most appropriate and beneficial environmental and energy efficient measures an in-depth assessment of the energy saving measures was performed. Some measures were discounted for reasons of their extended payback period, such as the solar hot water system and energy from waste. A wind turbine was considered but would have been too large and too noisy and impacted on local air traffic. A combined heat and power system was ruled out as requirements for this were unlikely to be met. Bore holes were recommended to facilitate geothermal ground and surface water heat pumps but there were concerns over the time taken to bore and prepare holes, as well as the costs and risks regarding correct operation.

The orientation and form of a building can have a huge effect on the energy use. On the PRIDE site, layout is limited by the nature of the use of the buildings and the existing buildings and access routes. For example, there is limited scope for glazing given the nature of the building and high performance glass has been used which minimises building loads.

Where there are windows the artificial lighting has appropriate daylight control in order to fully realise the potential energy savings.

Living or green roofs are those which have vegetation on them and this has a beneficial effect on energy performance all year round. Part of the new Pathfinder building roof has a (sedum) green roof which will gain additional DREAM credits. During the winter, this vegetation reduces the wind chill effect, reducing the heat loss. In the summer, the vegetation reduces the heat sink effect as it does not absorb as much heat as concrete would, reducing the cooling load.

Wood fuel is considered to be CO₂ neutral because the carbon released from combustion is only what was absorbed by the tree during its life. This option was recommended for PRIDE, subject to confirmation of supply source, facilities and space for delivery of material, including personnel to direct drivers, etc., and sufficient space and facilities for storage. The new buildings have utilised a biomass boiler in a central low temperature hot water (LTHW) 'distributed' heating system.

All in all, passive measures, which are included in the new building are the high performance glazing and artificial lighting with appropriate daylight control as well as a living roof. Active measures include the utilisation of rain water harvesting for non-potable applications and the biomass boilers.

The incorporation of these options means that the new PRIDE buildings are as environmentally friendly as we can make them, considering value for money and practicalities.

AVM Jon Rigby, DCI3 and Senior Responsible Owner (SRO) for PRIDE, speaking about Wyton Transformation said:-

"PRIDE Wyton is proving to be an example of MOD and its people operating at their very best to deliver a world beating capability. My Programme and Operational teams have worked hand in glove with DE&S delivery teams; DIO and Industry (particularly SKANSKA the building prime contractor). Their work has taken a building project; integrated it with IT, people and business change opportunities to create this transformation. The manner in which



Close up of the sedum which was used for planting on the roof of the Pathfinder building © Crown

they have grasped this opportunity is heartening. By being clear on requirements, benefits, responsibilities and programme structure - managing risk and seizing opportunities - we have proved what MOD people and Defence can do if given the resource and freedom to do so.

As we move to occupy our new facilities and work through the inevitable snags - we are set to deliver on time, on cost, but

with significantly greater performance than we had planned or hoped for at the outset. This is just the start of a vibrant future for Wyton and the Defence Intelligence community".

Ms Melissa Barr
DI ER Communications Support



Handover of the building to MOD. (Left to right) Paul Wileman - PRIDE Delivery Manager, Neil Jordison - PRIDE Team Leader, Matt Collins - Skanska Project Director and Rob Dawson - DIO Project Leader © Crown

Restoring open habitats on the Defence Estate: **Heathland at Lulworth Ranges**



Sand lizard one of the many rare heathland species that will benefit from the restoration project © Iain Perkins

In 2010 the Forestry Commission (FC) published guidance on how to decide when to convert woodland into open habitat in the UK.

The aim of this 'open habitats' policy is threefold:

- Generate biodiverse landscape of open habitat and woodland that provide long term benefits to people and wildlife
- Make sure that conversion of woodland results in more open habitat which makes a significant contribution to biodiversity objectives
- Minimise any negative impacts on the ability of woodland and forestry to increasingly contribute towards a low carbon economy

When to convert woods and forests to open habitat in England: Government policy (Forestry Commission, 2010)

The policy establishes the principle of the right tree in the right place; the right habitat in the right place; and the right change at the right pace. A key consideration is the need to maintain the total area of woodland in England so the rate of woodland removal and woodland creation is balanced.

The FC policy specifically mentions the Defence estate and highlights the obligations MOD has to restore open habitats. It refers to good work done in recent years to restore grassland and heathland by removing plantations across Sites of Special Scientific Interest (SSSI) and even cites the MOD's use of Integrated Rural Management Plans as an effective way of identifying



Nightjar and chick © David Kjaer

opportunities for restoring open habitats, where this is compatible with military training.

The policy includes a presumption in favour of removing woodland growing on SSSIs where it limits the extent of SSSI habitats or species. It sets a target for conversion of woodland to open habitat of about 1,000ha per year. The MOD is making a major contribution to this target across several sites and Lulworth Ranges in particular.

Povington Grange Heaths SSSI includes some of the best examples of heathland in Dorset. It covers almost 800 ha of Lulworth Ranges, including some large and open expanses. The landscape is reminiscent of the wild open heath described in the Thomas Hardy novel, 'Return of the Native'. In a preface to the novel published in 1895, Hardy wrote that the character of such heaths was being "...somewhat disguised by intrusive strips and slices brought under the plough with varying degrees of success, or planted to woodland". Over a hundred years later we are redressing the encroachment of planted woodland and restoring the open character.

The benefits to wildlife are tangible. The Ranges support a host of rare heathland species including Dartford warbler, nightjar, sand lizard, smooth snake, heath tiger beetle, southern damselfly and overwintering hen harriers. All these species will benefit from the creation of areas of open heath and a reduction in woodland edge.

After several years of discussion, a felling plan is being implemented that will result in the removal of 160 ha of plantation woodland over a ten year period and the restoration of these sites to lowland heath. All the clearfell sites are within the SSSI, which also forms part of Dorset Heaths Special Area of Conservation and Dorset Heathland Special Protection Area.

The retention of large areas of woodland is essential to provide a mixed landscape that can support military training. The recent construction of a Forward Operating Base has reinforced the need to provide cover for patrolling troops. However, with the support of the Army the military need was balanced against the statutory duty to restore the SSSI and the felling programme began in 2010.

The Lulworth Ranges plantations are typical of many established on the MOD estate in the second half of the last century. They are even-aged conifers between 35-50 years old. Some stands are coming towards the end of their growing cycle and while many are being felled prematurely they are still providing a significant economic return.

The timing of the felling operations is critical to the chances of successful heathland restoration. Much academic study has been devoted to this subject and one of the main findings is that large, viable seed banks of heathland flora can survive beneath conifers for up to 40 years and in some cases longer. A deep litter layer of conifer needles limits seed germination and

this also relates to the age of the plantation. For these reasons, amongst others, the chances of restoration are considerably greater if trees are removed before the end of their growing cycle and in the long term this reduces the aftercare costs.

The Lulworth Ranges restoration project is being delivered in partnership with different organisations. The felling proposals were subject to a full Environmental Impact Assessment (EIA), which included a noise abatement study. The EIA was subject to public scrutiny before a felling licence was issued by the Forestry Commission. In the long term, the restoration sites will be grazed and managed by Dorset Wildlife Trust and farm tenants as part of Higher Level Stewardship agreements, which have all been initiated by Natural England.

This project has taught us that converting plantation woodland to open habitat is a complex and long term process that involves a wide range of environmental specialists. Delivering a landscape that supports military training in a changing world is equally complex. However, the recent increase in military training in this area and the discovery of four male nightjar territories in 2012 suggests we may just be getting the balance right.

Oliver Howells
Ecologist
Defence Infrastructure Organisation



Lulworth Range © Crown



Smooth snake © Iain Perkins

The RAF Scampton Heritage Centre re-opens



Model of a Lancaster bomber © Crown

Since 1916 RAF Scampton has been an active military airfield with a rich and varied history and our most famous sons are the brave airmen of 617 Sqn, also known as the Dambusters. It was an extremely important base post-war, housing one of the United Kingdom's nuclear deterrents, the Blue Steel Missile, carried by the iconic Vulcan bomber. Today Scampton leads an illustrious life as home to the world famous RAF Aerobatic Team, The Red Arrows, and Number One Air Control Centre.

A Heritage Centre was created at Scampton in August 1993 to protect the heritage and experiences of those who served there over the years, located in the annexe of Hangar Two, the original home of 617 Sqn during the famous spring of 1943. In early 2012, work began to bring the hangar back onto general maintenance after a period of 'wind and weather' upkeep. Unfortunately, there were no public funds to complete the refurbishment after the initial maintenance and so the remarkable story begins.

Friends and volunteers of the Heritage Centre set to work on a 'self help' basis, paying for material through the kind donations from visitors, and decorated the annexe from top to bottom. New carpets were fitted and painstaking work was carried out to restore the walls and original metal windows. Chosen for a community development project by the Prince's Trust in Lincoln, ten disadvantaged teenagers met every day for two weeks to assist with the restoration. The history and artifacts could then be displayed and visitors welcomed.

Officer Cadets from RAF College Cranwell - including a cadet from Afghanistan and a cadet from Trinidad and Tobago, gave up a precious weekend during their intensive six month course to lay gravel and apply yet more paint. The help they provided was invaluable, resulting in the Heritage Centre being ready for the official re-opening on the 22nd June 2012, 69 years to the day when Wing Commander Guy Gibson and his squadron colleagues went to Buckingham Palace to receive their bravery awards, including Gibson's Victoria Cross.

The refurbishment took three months and is a remarkable tribute to the effort and dedication of a small group of enthusiastic volunteers. Most notably, the office of Wing Commander Guy Gibson has also been restored; close to what it would have looked like in 1943. The team of eleven permanent volunteers and tour guides were

awarded an Air Officer Commanding (AOC) 1 Gp Team Commendation in January 2013 for their contribution to the Heritage Centre and for the renovation project.

The Heritage Centre incorporates over 1,500 items, covering the Station's history from 1916 to the current day. Force Development visits and Staff Rides can be arranged by contacting FS TDF. Entry is free to the general public and school visits by appointment only. Tours take place throughout the year and includes other well-known sites on the Station; notably the grave of Guy Gibson's pet black Labrador, the frontage of the old Officers' Mess, and not to forget Wg Cdr Guy Gibson's office! On 16th May 2013, RAF Scampton held a Sunset Ceremony to commemorate the 70th Anniversary of the Dambusters Raid and welcome back two veterans Mr George 'Johnny' Johnson and Mr Les Munro amongst other distinguished guests.

To arrange a visit, contact the following:

OC Base Support Flight
01522 733152

FS Training and Development Flight
01522 733140

Heritage Centre Head Curator
01522 738361

Flt Lt Sarah James
OC Base Support Flight
RAF Scampton



Grave of Wg Cdr Guy Gibson's pet Labrador © Crown

Website - www.raf.mod.uk/rafscampton/aboutus/rafscamptonmuseum.cfm

Trip advisor - www.tripadvisor.co.uk/Attraction_Review-g186336-d2049455-Reviews-Royal_Air_Force_Scampton_Museum-Lincoln_Lincolnshire_England.html#REVIEWS

The Heritage Centre has a Facebook page.

The Heritage Centre is VAQAS accredited with VistEngland.



Maintenance begins © Crown



The Vulcan Room © Crown

Carbon Target **zero**



The new E Trucks arrive at Gamecock Barracks © Luke Peat

Midland Management Services (MMS), one of CarillionEnterprise's supply chain partners, have recently purchased three electric vehicles for use on Regional Prime Contracts (Central) sites in the Midlands.

Since the beginning of April 2013, MMS operatives at Gamecock Barracks have been using two of the vehicles to carry out their maintenance services on site. They have already reduced their carbon footprint, reduced the cost of vehicle repairs and more significantly, achieved zero fuel costs!

The first of the two vehicles is known as an E Truck and is virtually silent when running. In addition, it does not require petrol, oil or a road licence and can be recharged anywhere by plugging into a standard electrical outlet.

The E Truck has fewer parts than a conventional car which means operating costs are significantly reduced with oil changes and expensive repairs becoming a thing of the past. It seats two people comfortably and has a large loading area which can carry up to 400kg. The vehicle has a maximum speed limit of 50mph and can cover a distance of 50 miles before needing to be recharged.

The second vehicle being used by MMS is the Citroen Berlingo électrique which is a 100% electric version of the Berlingo van. Slightly larger than the E Truck it has a maximum range of 40 miles of typical driving, but is able to reach a speed of 59mph. Again it has all the advantages of the E Truck with reduced maintenance costs and zero fuel costs.

Both vehicles can be charged overnight in just six hours for as little as 10 pence per charge!

The new electric vehicles are ideally suited for the day to day response jobs that the team need to carry out on site.

In fact, they have been so well received by the team at Gamecock Barracks, that plans are already underway to introduce a third vehicle at Whittington Barracks in the very near future.

Based on historical business site miles each vehicle will save at least ¾ tonne of CO₂ per year.

Seaton Price
Sustainability Manager
CarillionEnterprise Ltd &
MODern Housing Solutions Ltd



Energy saving E Truck © Luke Peat

Safeguarding Britain's endangered White-clawed crayfish



White-clawed crayfish © Crown

The white-clawed crayfish *Austropotamobius pallipes*, the UK's only native crayfish species, was once widespread in rivers across England and Wales. They are best imagined as freshwater cousins of the lobster and can grow up to 12cm in length. Catastrophic declines in recent decades mean this crayfish is at risk of extinction, and conservation action is urgently needed.

Pollution and damage to river habitats have played a part in the decline of the white-clawed crayfish, however the most devastating threat is from non-native crayfish species, such as the American signal crayfish *Pacifastacus leniusculus*, which is spreading and out-competes white-clawed crayfish for food and space. Many signal crayfish also harbour an organism which can infect and wipe out native crayfish populations in weeks - nicknamed 'crayfish plague'.

How did they get here?

In the 1970s, signal crayfish farming was seen by the Government as an option for farming diversification, and the non-native crayfish was introduced to lakes and ponds as part of farm diversification schemes. Since then it has been a terrible news story for river

wildlife, as these animals were subsequently released or escaped into rivers. In addition to the impact on our native crayfish, signal crayfish are also now known to damage fish populations (affecting anglers) and destabilise river banks.

What is being done to benefit White-clawed crayfish on MOD land?

A solution to safeguard white-clawed crayfish is to re-locate 'at-risk' populations to safe-haven waterbodies, known as 'Ark sites'. Ark sites must be isolated (to minimise risk of non-native crayfish colonisation) with little human disturbance. The South West Crayfish Project has been a pioneer in this conservation technique and recently teamed up with the Defence Infrastructure Organisation to establish an Ark site on land owned by the MOD in Dorset. Led by a team from Avon Wildlife Trust, Buglife and the Environment Agency, DIO ecologists helped to relocate and release white-clawed crayfish from a threatened population in Dorset to the new safe haven in May 2013.

Prior to this, the release site was surveyed in detail to check there was no existing population (signal or

white-clawed) and confirm the habitat was good enough to support the introduced population. This included a survey of water levels, water quality, prey populations and other key habitat features. It's a short isolated catchment and like many MOD sites the water quality is very good due to the absence of agricultural inputs on surrounding land. The lack of public access was also deemed beneficial because this reduces the risk of inadvertent disease transfer.

Can MOD Conservation Groups help?

Finding ways to eradicate signal crayfish and to halt their spread is an ongoing challenge. Firstly, it is crucial that no more non-native crayfish are moved to new areas, which is why removing any crayfish from the wild requires permission from the Environment Agency. Secondly, there is a great deal of misinformation that eating a few signal crayfish will help white-clawed crayfish. Although this all sounds very worthwhile, the scientific evidence suggests that it does not help.

For the white-clawed crayfish in the new MOD Ark site, the future looks good. A monitoring regime will be put in place, with support from Dorset Wildlife Trust, as part of their work with the MOD Conservation Group. It is hoped they will thrive long into the future.

Lydia Robbins
Ecologist, South West Crayfish Partnership



A small pool was an ideal location for the first release © Crown

'Cannon to Right of them, Cannon to Left of them' **Historic Range targets on Salisbury Plain**



15-pounders of the Honourable Artillery Company at Fargo Camp © US Library of Congress

It doesn't take long for current events to become history, and from there to pass into the realms of archaeology. Take, for example, the life-story of two artillery pieces found on Salisbury Plain and excavated as part of 'Operation Nightingale', the recovery programme for service personnel using Cultural Heritage.

These Ordnance QF (Quick Firing) 15 pounders were from a consignment of 108 originally purchased from the Rheinische Metallwaren Company in

Germany in 1901. Bought to evaluate new weapons platforms that had wreaked havoc against the British Army in the Boer War, these 'Ehrhardt' guns were to revolutionise the development of artillery in Britain. Indeed they would be re-carried and used against Axis forces in the Great War.

The guns came to the end of their useful lives and were eventually placed as range targets on the Larkhill impact area. With the imminent centenary of the Great War however, interest in such pieces of military equipment is growing - especially when one considers that there are no other 15 pounders that survive in Britain.

Found thanks to the sharp eyes of Cpl Martin Puxley of the RAF when he accompanied the author, ex-gunner Mark Khan of the Larkhill and Westdown Conservation Group, and Sgt Graham Moore of the RAF on a foray to look at historic crash sites, these

seemed too important a pair of artefacts to simply leave to rust away.

On a snow-laden February day, during a shut down period, a team of gunners from the Royal School of Artillery at Larkhill, with infantry support from the Riflemen of 'Operation Nightingale' excavated the areas of both guns whilst 135 Geographic Squadron, Royal Engineers, surveyed the resulting finds. The team soon found that work on one of the field pieces would have to cease when live ordnance was encountered and the site ATO (Ammunition Technical Officer) advised a speedy retreat! This particular gun still held an identification plate from its carriage, which assisted in the identification process. The other gun was a greater success and, after a hard day's work, was recovered and taken back to Larkhill before plans to restore it to former glories could be enacted. There are a few images of the Honourable Artillery Company (HAC) using this type

of gun which survive; denoted as being at Fargo at Aldershot (in fact Salisbury Plain) and it is tempting to think that one of these is the very gun found by the service personnel.

The excavation formed a perfect precursor for the next work of 'Operation Nightingale' - the improvement of a Scheduled Monument at Woolwich to enable it to be taken off the English Heritage 'At Risk' list. This monument, a linear fortification constructed at the start of the 19th century was now overgrown with scrub and a team including English Heritage, Mark Sanderson from DIO, soldiers from 7 Rifles, and volunteers worked for a morning to remove all this undergrowth. The results were such that the condition of the monument was greatly improved and the Statutory Body delighted with the change to this artillery monument.

Richard Osgood

Senior Archaeologist

Defence Infrastructure Organisation



The all-important data plate that was recovered from one of the gun carriages © Crown



Clearing the soil around the carriage continues © Crown



Recovering the gun carriage © Mark Khan

Pond Conservation

Flagship pond projects



The Fowl's Pill sits at the heart of the Defence Infrastructure Organisation's Otmoor Range © Phil Cutt

The last few years have seen growing awareness of the remarkable importance of ponds for freshwater life.

Despite the comparatively tiny size of most ponds, across the landscape they collectively support a wider variety of freshwater plants and animals than either rivers or lakes, and more of our most endangered freshwater species. Amongst the many thousands of wonderful ponds we still have, 500 or so of the very best are in the process of being identified as 'Flagship Ponds' under the UK Biodiversity Action Plan. These are the *crème de la crème* of Britain's freshwater habitats and jewels in the landscape that make a unique contribution to Britain's wildlife.

Now Pond Conservation, working in partnership with a range of organisations, is beginning a new

programme to protect and manage these critical and fragile wildlife sites. At a time when around 90% of our lowland freshwaters are degraded, many as a result of intractable pollution problems, equipping volunteers and professionals to help safeguard these wonderful places is a vital activity. The identification of our Flagship Ponds started back in the early 1990s when Pond Conservation began surveying ponds throughout the country. The results of these early surveys were later used to identify the first Flagship Ponds, including the heathland pools of the Lizard in Cornwall, Dorset and the New Forest in Hampshire, the remarkable Norfolk pingos, the huge concentration of clay pit ponds around Peterborough that support the UK's largest great crested newt population and the moorland ponds of the Lake District.

Now, at the beginning of 2013, we have about half of the planned 500 Flagship sites identified with the list to be completed as part of the new project, in consultation with local groups and

organisations. We have already identified a number of Flagship Ponds on military land and expect to find more given the generally high biological quality of ponds on the land managed by the Defence Infrastructure Organisation.

The aim of the Flagship Ponds project is to help local groups and site managers monitor and manage these special sites so that they stay special - something which we can no longer take for granted. The project started as a pilot in Wales during 2011-12, supported by the Countryside Council for Wales (now part of the new 'Natural Resources Wales' organisation). It established a simple monitoring protocol intended to provide an early warning system to raise the alarm if there are threats or changes to a pond.

The initial trial focused on two areas: Dowrog Common, an area of lowland heathland in North Pembrokeshire renowned for its endangered water plants, such as pillwort, three-lobed crowfoot, yellow centaury and lesser

water plantain; and Brefcha Pool near Brecon, noted for its mud snail and pillwort populations. The Dowrog surveys indicated that the ponds were well protected by the surrounding heathland - an environment providing a good supply of clean and unpolluted water. In contrast, project volunteers were able to highlight some potential threats to Brefcha, mainly from agricultural runoff.

Over the next three years, and building on the pilot, Pond Conservation now plans to roll out the Flagship Ponds Project across the whole of England and Wales, including several military sites. Altogether the programme will work initially with around 100 local groups, 1-2 per county, to monitor and protect the very most important ponds (or groups of ponds) and, where possible, strengthen the resource by creating new high quality ponds.

The Flagship Ponds already selected on military land give an indication of just how important these special waterbodies are. Two sites in southern England give a flavour of the way in which military activity helps protect life in freshwater: Woolmer Forest and Otmoor.

Woolmer Forest in Hampshire has been a British Army training area since 1880 and is now the only site in the Britain which supports all twelve native amphibian and reptile species. Its ponds are important particularly for the only native population of natterjack toads *Bufo calamita* in southern England. Although once common on the heaths of Surrey and Hampshire, and around the coast of East Anglia,

now only one or two of the original colonies of natterjack toads remain in southern England although the species has been reintroduced in several places. Under licence from the MOD, wildlife charity Amphibian and Reptile Conservation manages almost 200ha of Woolmer Forest, including the western part that has many water bodies of different sizes and depths created over the last 20 years. Woolmer shows us how heathland still provides an ideal environment for freshwater plants and animals. As well as protecting these important waterbodies, the Flagship Ponds project will help create even more new breeding pools for natterjacks, and other endangered plants and animals, as well as providing money for training and practical conservation work.

Moving further up the country, to Oxfordshire, Otmoor Range gives a glimpse into the farmland of 100 years ago, before modern methods took over and left most lowland waters contaminated by nutrients, sediments and other chemicals. At the heart of this intensively used rifle range, on low-intensity extensive grassland, lie two of the country's finest wildlife ponds: the Fowls Pill and the New Pill. Managed in co-operation with local farmers these two ponds remind us of what has been lost from large parts of the countryside. Fed by unpolluted water draining the grasslands that make up the range, the site is famous for its sheets of white-flowered water-violets in spring and for a variety of endangered water plants like tubular water-dropwort *Oenanthe fistulosa* and tassel stonewort. Tubular water-dropwort is a declining species which is classed as Vulnerable in the UK,

and is found on the outer margins of well-established ponds and river meadows, including ridge and furrow systems. This species has appreciably declined because of drainage, eutrophication, weed control and conversion to arable. Most losses appear to have occurred since 1950. Tassel stonewort is a specialised plant of seasonal ponds and needs regular drying out to survive. Its once-common habitat - clean water and ponds that dry out in summer - has been lost from most of the lowland countryside and Otmoor provides one of the few places where this species can still be found in southern England. Otmoor is one of those sites which have only limited monitoring at present and although it looks as though it's staying in good condition, without regular surveys and support for the local volunteers helping to manage the site, we can never be sure that the site won't decline in quality.

By the end of the three year project we envisage a self sustaining network of expert volunteers, across the landscape, who are equipped with the monitoring techniques needed to identify threats, know when to raise the alarm if things look like they are taking a turn for the worse, and who are able to get the help they need from specialist advisers and conservation funders. So, the future is beginning to look just a bit rosier for these wonderful places.

For further information contact Kathryn Walker at Pond Conservation (kwalker@pondconservation.org.uk).

Jeremy Biggs
Director at Pond Conservation



Woolmer Forest the only site in the Britain which supports all twelve native amphibian and reptile species © John Buckley

Carbon Savings in Action

RNAS Culdrose runways



Aerial photograph of airfield taxiways © Crown

This Defence Infrastructure Organisation (DIO) and Lend Lease project reconstructed the airfield taxiways and sections of runways, together with the airfield ground lighting and ancillary equipment, at Royal Naval Air Station (RNAS) Culdrose, one of Britain's busiest Fleet Air Arm military airfields.



Breaking the concrete © Lend Lease/Debut

Delivered through the Regional Prime Contract South West, a fundamental principle was agreed from the start of this project to ensure that all of the waste arising from the resurfacing works and regrade areas were retained on site for reuse. This made a substantial contribution to reducing volumes of virgin materials used within the works and both the carbon and embodied energy associated with transportation, quarrying and disposal. Early liaison with the local specialist supply chain also ensured that the project was aiming for zero waste off-site from the outset.

During the works, 18,645 tonnes of existing pavement surface was planed out and the different types of material were segregated as the works progressed. All the material was reused in the works as delethalisation material to the runway edges or ends, which also included 973m³ previously stockpiled from the previous project.

5,637 tonnes of tar-bound material from below the pavement was

removed and segregated, which was reused as replacement aggregate by encapsulation within the dry lean concrete (DLC) mix. If this had not been reused on site then it would have been disposed of to landfill in Swindon, 225 miles away. The reuse of the tar-bound material on site saved 40,750 kg CO₂ from unused travel miles. This reuse of aggregate also made up 28% of the total material required for the DLC, therefore reducing the requirement for new aggregate being brought to site. The nearest supplier was Melbur Quarry at St Column, which was a 64 mile return journey. The reuse saved 19,346kg of CO₂ from these journeys. The site also had its own batching plant which reduced transportation of DLC from off site.

All other excavated materials were crushed and blended for reuse on site, including stone, the existing DLC and PQ concrete. This was processed on site and reused as sub-base or fill to provide flat areas in safety zones or to assist with drainage in areas where the airfield had ponding problems.

Some 13,696m³ of topsoil was processed on site and reused, all metal from site was recycled and the FSC timber shuttering for the concrete bases was reused up to 20 times each. All other waste from site, e.g. office and welfare, had a diversion from landfill rate of 94%.

As part of the project, Lend Lease also reseeded 84ha of grass with a new airfield seed mix. This resulted in the following benefits to both carbon sequestration and mowing regime.

The main benefit to the MOD was through savings in materials and costs for the disposal of hazardous waste at Swindon. It has been estimated that the saving of re-using the tar-bound material on site was in the order of £900k.

There have also been positive benefits to the local community through reductions in transportation to and from the Helston site. Other benefits have come from saving landfill space, fuel and carbon release from transportation to landfill sites in both Cornwall and Swindon.



Saw cutting runway © Lend Lease/Debut

A 'Good Practice' Case Study is being developed in liaison with RNAS Culdrose to promote the project work locally and within the MOD.

RNAS Culdrose is a major employer for the area and this project was locally very important. The Environment

Agency is also interested in using it as a Case Study example to promote good practice to others nationally.

Catherine Pinney
Environment and Sustainability Manager,
Lend Lease

	Existing Ryegrass/Fescue mix	New Perennial Ryegrass mix
UK carbon sequestration level	562.80 tonne per year lock up	1,501.92 tonne per year lock up
Frequency of mowing	22 times per year	10-15 times per year
Carbon Lock-up Benefit		939.12 tonne per year sequestration plus CO ₂ saving on - 50% of mowing regime



Reusing the aggregate prior to resurfacing © Lend Lease/Debut

Bare peat restoration on Warcop Military Range



An example of the bare peat on Warcop Fell on large (13.5 ha) eroded peat body © Alistair Lockett

What is bare peat and why restore it?

Blanket bog is an internationally important habitat, with a healthy functioning bog having the ability to sequester carbon. However, when a blanket bog is degraded, or worse, has no vegetation at all, it leaves the peat vulnerable to erosion through frost heave, drying, wind and water damage. Along with losing valuable vegetation, it is the release of carbon into the atmosphere and nearby water courses that poses the greatest problem to the environment.

The North Pennines Area of Outstanding Natural Beauty (AONB) contains the largest peat bog in England at 90,000ha. Of that total, 2,800ha of bare peat has been identified, and some of it has been found at Warcop. Why these areas first started to erode is not always clear. Air pollution and acid rain have caused the loss of sphagnum (a moss that contributes to the formation of peat bogs) from many moors in the Peak District and Southern Pennines. However, air pollution levels are lower in the North Pennines and so other factors have contributed to the loss of bog vegetation. For example, moorland burning for grouse

management and over grazing can damage bog vegetation which can cause peat to actively erode. Landslides, bog bursts after extreme weather events or natural slumping of old hags can also create areas of bare peat. Grazing pressures and harsh weather conditions can prevent these areas naturally re-vegetating.

A partnership between The North Pennines AONB Partnership (NPAP), the MOD and Natural England aims to survey and begin to restore bare peat areas at Warcop so that further loss can be prevented and bogs can be returned to full health.

Warcop and surrounding areas

Both Warcop and the adjoining Murton Fells are nationally and internationally protected and have been officially designated as Sites of Special Scientific Interest (SSSI), a status gained for both its blanket bogs and its collection of breeding waders which includes curlews, golden plover and oystercatchers.

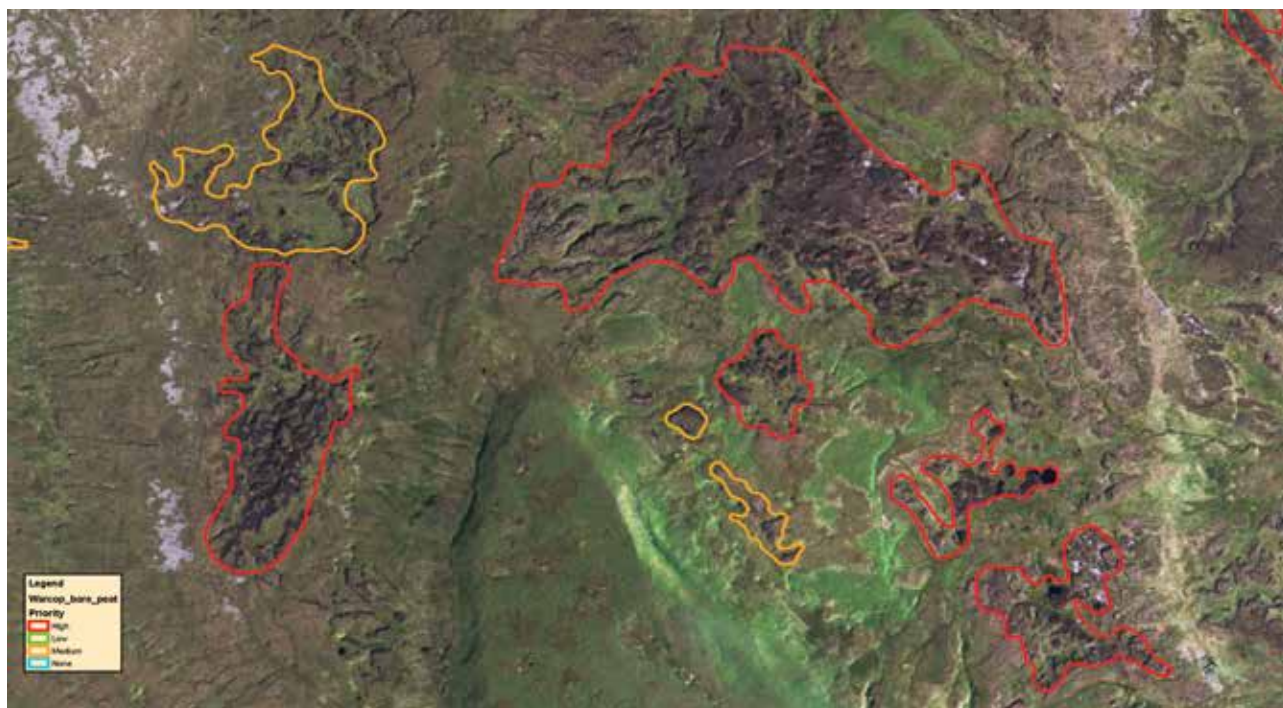
The entire Warcop military range was surveyed in 2012/2013 revealing fantastic bog habitat which is home to a range of sphagnum mosses and dwarf shrubs. From the initial survey 35

sites, totalling 113ha of bare peat, have been classified as 'high priority'. These are areas that show signs of active erosion with little sign of re-colonisation by cotton grasses or other species.

Meetings between staff from NPAP, the MOD and Natural England have resulted in plans being drawn up to start restoring the worst bare peat sites. The project will start by restoring approximately 20ha of bare peat. Once this work is completed we will look at expanding our work to the other high priority sites on Warcop and Murton Fells.



Peat forming sphagnum © Laura Harrington



Warcop aerial photograph showing bare peat areas © NextPerspectives

The North Pennines AONB Partnership will use a five step restoration plan.

• Control of grazing

Normally this will be a temporary stock fence for the exclusion of sheep and deter people from driving and walking over the site. However, due to access constraints and the low numbers of sheep grazing on Warcop Fell (with the sheep being off-wintered), a fence will not be erected

• Hydrology

Running water within bare peat sites can prevent re-colonisation and cause new erosion to occur. Leaky dams will be placed along these active channels to slow the water down which, in turn, will promote re-vegetation by cotton grasses and other bog species

• Steep slopes

Steep slopes need to be stabilised in order to prevent erosion in flood conditions and promote plant establishment. Slopes need to be less than 33° for stabilisation treatments to work. This can mean reducing the slope by re-profiling or similar engineering works

• Heather brash

All of the bare peat will be covered with a thin layer of cut heather. This will prevent frost heave and the

subsequent drying and erosion by wind. The heather brash will also provide material for moss and other plants to grow on

• Re-vegetation

To encourage the growth of plants on bare peat, additional seed and nutrients can be added during the initial stage of restoration. Small amounts of phosphate and lime will be added to improve soil conditions, and then heather and cotton grass seed will be added along with fragments of sphagnum moss

The bare peat sites on Warcop are in a very remote location surrounded by healthy, but sensitive, blanket bog. The NPAP has previously used temporary

plastic matting or helicopters to transport materials to the restoration sites, which will protect the bog.

"This is the first time we have worked with the MOD restoring peatlands. MOD staff have been helpful and enthusiastic about the restoration works and I am looking forward to working with a new partner to complete this work. It's testament to the organisation's commitment to conservation that these large scale works are going ahead."

Alistair Lockett

Conservation Assistant with the North Pennines AONB Partnership



Volunteers spreading heather brash as part of peatland restoration works, winter 2012 © Alistair Lockett

Expedition Painted Shrimp Ascension Island



Scarlet striped cleaner shrimp *Lysnata grabhami* © Shallow Marine Survey Group

Ascension Island is an isolated volcanic island in the equatorial waters of the South Atlantic, around 1,600 kilometers from the coast of Africa and 2,250 kilometers from the coast of South America. It harbours globally important biodiversity, potentially representing a unique assemblage of Western and Eastern Atlantic flora and fauna. The British military presence provides a forward operating base in Ascension for the Falklands and West Africa. This location comes under the command of the British Forces South Atlantic Islands.

The Falklands Islands Sub Aqua Club (FI SAC), a military diving club based at Mount Pleasant Complex in the Falkland Islands, was asked if it would support the Shallow Marine Survey Group based in the Falklands on a three week marine research expedition. The request to FI SAC was to provide logistic expertise and scuba diver support to Ascension. This was a Darwin funded project - a UK Government initiative to assist countries that are rich in biodiversity but poor in financial resources.

In August 2012, five FI SAC scuba divers joined over twenty scientists from around the world, including Greece, Germany, Madeira, Scotland, England and the Falkland Islands. The purpose was to spend three weeks collecting, recording, cataloguing, measuring and

photographing the wide diversity of marine life found on the rocky reefs fringing the island.

The FI SAC team were fully involved in all the research work including intertidal and sub-tidal surveys, quantitative photo-quadrats, species collecting and processing, photography and support to the scientists conducting research. This remarkable and ambitious international effort was, and continues to be, fully supported by the Ascension Island Government.

Records from the expedition will be used to construct faunal and floral species inventories, habitat descriptions and maps, a field guide to marine invertebrates, algae and fish, a report on the status of marine endemics, a report on the potential impacts of climate change and a report on sustainable fishing. An entire edition of the Journal of the Marine Biological Association of the UK is to be dedicated to the results of this expedition. The expedition recorded several species new to Ascension and to science, which is extremely exciting!

The largest species encountered and photographed was a group of bottlenose dolphins that accompanied one of the dive boats on the way to Boatswain Bird Island. The largest creature captured was certainly the

hawksbill turtle which was tagged, measured and released from Georgetown pierhead. One of the smallest creatures recorded and captured was a tiny sea slug, belonging to a genus called *Sacoglossa*, living on the green alga *Bryopsis*.

Some project statistics:

- 80 under water quantitative and qualitative transects completed
- 120 Joint Nature Conservation Committee (JNCC) survey forms completed
- Over 600 species recorded
- 180 crabs caught and measured
- 1 Hawksbill turtle tagged, genetic sample taken and measured
- 8,000 under water photos taken

At the end of the three week expedition the FI SAC team were exhausted but exhilarated and felt very privileged to have been involved in such an exciting project. Phase two of the project commences June 2013.

To learn more about the trip, the expedition blog can be viewed at www.smsg-falklands.org/blog.

Lt Col Simon Browning
OIC Falkland Islands Sub Aqua Club

Sarah Lee Secretary
Falkland Islands Sub Aqua Club

QinetiQ goes Passive at MOD Aberporth



Bottlenose dolphin found off the waters of MOD Aberporth © Crown

QinetiQ recognises the benefits of sustainable development in the conduct of its activities. A clear Environment and Sustainability Policy drives continuous improvement in our environmental performance throughout the business.

QinetiQ manages the Range at MOD Aberporth under a 25-year Long Term Partnering Agreement (LTPA), delivering Test and Evaluation (T&E), and training support services to the UK MOD and Defence contractors. On this particular Air Range, the company specialises in the T&E of guided weapons and aircraft systems, often via complex trials. Situated within the Range Danger Area is the Cardigan Bay Special Area of Conservation (SAC). A number of species and habitats have been identified as being of European importance. A key feature of the SAC is its resident population of bottlenose dolphin. It is the largest in Europe and one of only two significant populations within the UK.

Over the years, the Range has worked closely with The Countryside Council for Wales (now Natural Resources Wales), to ensure business activities do not have an adverse impact on the environment. QinetiQ recognises that certain trials activity has the potential to cause harm to marine mammals, and

thus strives to implement control measures that meet best practice, ensuring the potential risk to the environment is as low as possible.

In 2010, the Joint Nature Conservation Council (JNCC) released guidance for minimising the risk of injury to marine mammals, resulting from the use of explosives. Existing legislation, namely the Conservation of Habitats and Species Regulations 2010 (England and Wales) (as amended in 2012) and the Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended in 2009 and 2010) make it an offence to deliberately kill, injure or disturb marine European Protected Species. This includes all cetaceans in UK waters.

Passive Acoustic Monitoring (PAM) is recommended within the guidance as best practice mitigation at the time of operation. To date, the detection of marine mammals in the vicinity of the targets deployed by QinetiQ at the MOD Aberporth Range has relied exclusively on remote camera systems and visual observations by aircrew, since all personnel are excluded from the area when a trial is being conducted.

In simple terms, PAM utilises a hydrophone and processing equipment

to identify vocalisations and echo location emissions from marine mammals. Commercial, off-the-shelf equipment is generally expensive and requires the hydrophone and monitoring equipment to be placed in close proximity to where the activity takes place. Therefore, the QinetiQ employees on the Range needed a solution that was cost-effective but robust, given that it would be placed in a very hostile environment with a very real risk of damage or loss. It also had to be capable of being operated remotely, from the Operations Centre on the Range headland - which is in excess of 20 miles from the target area!

Thanks to the determination and innovation of QinetiQ's Martin Pope, an engineer from Surface Target Solutions (STS) based at MOD Aberporth, a bespoke system, tailored specifically to meet the needs of the Range, was successfully developed and subsequently deployed in 2011. During that time the system saw its first operational use for live air-to-surface firings with, crucially, the ability to halt the activity if marine mammals were detected. Since then, the system has undergone some minor modifications to further improve the scope of detection, enabling QinetiQ to play an even more active role in marine conservation, while at the same time delivering essential test and evaluation services to the MOD.

Danny Oldfield
Environment Advisor
MOD Aberporth

Paul Rowley
Range Safety Engineer
MOD Aberporth



Award winning Passive Acoustic Monitoring System
© QinetiQ

Green light for continued military training **on Cramber Training Area, Dartmoor**



Crazy Well Pool on Cramber Training Area © Crown

Military training has been taking place on Dartmoor for about 200 years, and a permanent training area was established as early as 1875.

The size of the training area has fluctuated over the years, but its present extent has been reasonably constant since a Public Inquiry, held in 1975 into military activity within National Parks; resulting in what is known as the Sharp Report. The Sharp Report suggested that the military use of one particular area of Dartmoor should be reduced, and the displaced dry training (i.e. training without live ammunition) should be concentrated on 848ha of land, which became known as Cramber Training Area (CTA) in 1980.

Whereas the MOD do not require planning permission to train over most of Dartmoor, due to such use pre-dating the planning legislation, this concentration of training on CTA post the Sharp Report triggered the requirement for planning consultation. The MOD have subsequently been granted a series of time limited consents by Dartmoor National Park Authority. These consents have contained planning conditions which have ensured a level of environmental protection and monitoring has been on-going. The latest of these consents expired in January 2013. To continue using the area, MOD had to apply for full planning permission to continue to train on CTA for the first time since losing Crown immunity within planning legislation.

Planning legislation requires that any development in excess of 1ha within a sensitive area requires a further formal planning process called the Major

Development Test. Clearly as the application to continue training on CTA was within the National Park boundary and covered a large area the Major Development Test was triggered. This meant that as well as demonstrating the on-going military need for continued training on CTA, the Major Development Test had to prove that such military use was not adversely affecting the ecology, archaeology or public enjoyment of the area. Rather than commission consultants to prepare the document, and undertake supporting surveys, DIO Land Management Services and Professional Technical Services undertook to prepare the document in-house, relying on a mixture of in-house surveys and commissioned surveys in discussion with Dartmoor National Park Authority staff.

The archaeological condition survey was undertaken by eminent local archaeologist, and Conservation Group



Visitors enjoying Cramber Training Area © Crown

member, Tom Greeves. CTA's well documented archaeology highlights a number of scheduled and non-scheduled monuments across the area ranging from old boundary stones, through tin working remains to prehistoric stone rows. A thorough survey was undertaken of each asset and compared with previous surveys to monitor condition. The survey demonstrated that the archaeology was generally in a stable condition with no damage or reduction in condition attributable to military activity.

The impact of military training on the ecology was also assessed in detail. This assessment was undertaken by one of DIOs in-house ecologists, Olly Howells. In addition to checking the Devon Biodiversity Records Centre records for rare species, there were a number of site surveys on areas where training tended to concentrate to check that such military activities were not reducing the quality of the moorland vegetation type or causing erosion. The surveys showed that the military use was not having any such impact on the vegetation.

The final series of surveys related to the public enjoyment of the site. DIOs Head of Access and Recreation, Richard Brooks commissioned a series of independent visitor surveys, during which members of the public were asked if they were aware of military

training on CTA and if so whether the use of the area for military training was having an impact on their visits. The surveys were carried out over a number of months during both peak and off-peak visitor days. The surveys were not only completed on CTA itself but also on nearby areas of a similar landscape value to capture any potential visitor who was discouraged from accessing CTA by the military activity.

DIO also undertook a survey of events organisers who had previously run recreational events on CTA to ascertain if the military activity had impacted negatively upon their events.

Analysis of the survey results demonstrated that the majority of actual and potential users were aware that CTA was a military training area, and understood the type of training activities. With very few exceptions, most people did not think that military use of the area spoiled their enjoyment of the area and they would continue to visit the site.

Prior to the finalisation of documents and planning submission DIO briefed the Dartmoor Local Access Forum (LAF) and ran a community briefing day in Princetown where anyone with an interest in CTA or the planning application could drop in and meet DIOs environmental specialists, land

agents and military representatives to discuss the application and raise any particular concerns. It was apparent that, as per the visitor surveys results, the vast majority of people attending the LAF and/or public briefing day did not perceive the military as having a negative on CTA.

The surveys, briefings, and preparation of the documentation was a huge undertaking, with many long hours put in by the various members of the team. The planning application was submitted to Dartmoor National Park Authority and went before the Planning Committee in February 2013. Following considerable discussion between the Committee members, they recognised that with the existing planning constraints the MOD's activities were being carried out in such a way as to prevent damage to the area and planning permission was granted to the for the continued use of the area for a further 40 years.

Nigel Sharpe

Senior Estate Advisor
Defence Infrastructure Organisation

Richard Brooks

Senior Access and Recreation Advisor
Defence Infrastructure Organisation



Stone cross at Cramber © Crown

MOD supports Coronation Meadows



Chancellors farm © Steve Bond

The Ministry of Defence has been playing its part in an exciting new project called Coronation Meadows. The project was inspired and initiated by HRH The Prince of Wales, and launched at Highgrove on the 5th June 2013. The aim of the project is to celebrate the 60th anniversary of The Queen's coronation by helping to reverse the enormous loss of wildflower meadows across the United Kingdom. The project aims to identify a flagship flower-rich meadow in each of the 107 counties of England, Wales, Scotland and Northern Ireland and from each to then create at least one new county wildflower meadow using the original donor Coronation Meadows as a seed source.

The partnership project is led by Plantlife with The Wildlife Trusts and the Rare Breeds Survival Trust, each of which shares His Royal Highness as their patron. Over 60 of the 107 donor Coronation Meadows have been identified and it is hoped the remainder will be identified by the end of the year.

For the new meadow creation to be successful the receptor sites need to have similar characteristics to the donor meadow, with low levels of nutrients in the soil and contain few pernicious weeds. There is also a requirement that both donor and receptor meadows are suitably managed and have some level of public access, either full time

through a public footpath or by agreement with landowner on certain dates.

One of the front runners in the project is Chancellors Farm Somerset, part of Yoxter Training Camp and Range, used by Wessex Reserve Forces and Cadets Association for tactical training and as a weapons range by both Cadets, Reservists and regular soldiers. It is managed by Somerset Wildlife Trust as a nature reserve and working farm. It is grazed by native breeds including Black Welsh Mountain sheep and Ruby Red Devon cattle and cut for hay.

This year seed was collected from the meadow using a brush harvester and will be used to seed a new meadow at

a nearby farm on the Mendips, with Somerset Wildlife Trust overseeing the work.

Otterburn Training Area has species-rich upland hay meadows and there are several potential candidates for a Coronation Meadow here. One example is at Barrowburn, in Northumberland National Park. There are two adjacent meadows which are some of the few remaining species-rich upland hay meadows in the county and are managed by a tenant farmer who sympathetically manages the land. He grazes his sheep there in the spring before taking them off for the summer to allow the wildflowers to grow and set seed, then returns them after a late summer hay cut, usually in early August. The fields have European Special Area of Conservation (SAC) status and are particularly known for their displays of wood cranesbill, but also contain alchemillas, pignut and yellow rattle providing excellent nectar supplies for upland invertebrates such as the mountain bumblebee.

Seed has already been taken from the Barrowburn fields to improve others in the Northumberland National Park. The Ministry of Defence is continuing to liaise with the project and continues to seek other opportunities for suitable parcels of land to take part.

www.coronationmeadows.org.uk

Dan Merrett

Coronation Meadows Project Manager
Plantlife



Barrowburn meadow © Northumberland National Parks

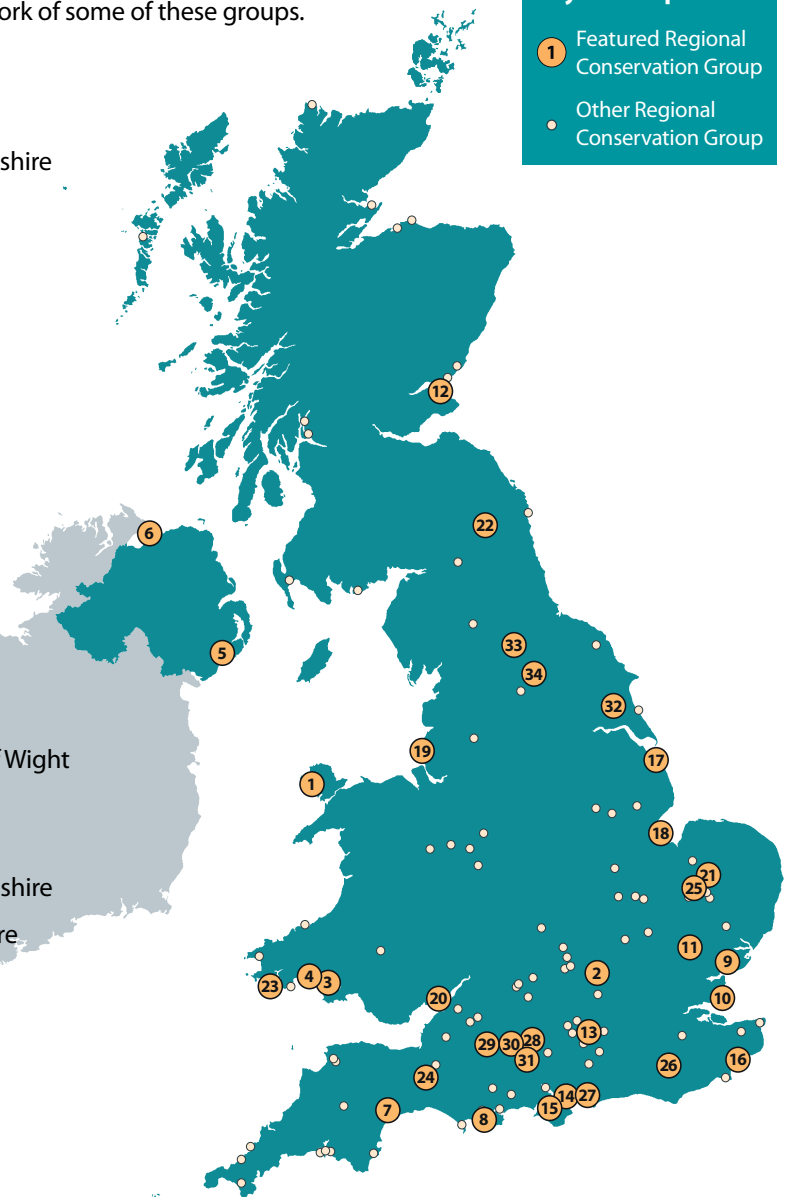
Around the Regions with the Conservation Groups

There are over 120 Conservation Groups operating across the MOD. The following section provides an update on the dedicated work of some of these groups.

Key: UK map

- 1 Featured Regional Conservation Group
- Other Regional Conservation Group

1. **RAF Valley**, Anglesey
2. **RAF Halton**, Buckinghamshire
3. **Air Weapons Range Pembrey**, Carmarthenshire
4. **MOD Pendine**, Carmarthenshire
5. **Ballykinler**, County Down
6. **Magilligan**, County Londonderry
7. **Lympstone**, Devon
8. **Bovington and Lulworth**, Dorset
9. **Colchester**, Essex
10. **MOD Shoeburyness**, Essex
11. **MDP HQ Wethersfield**, Essex
12. **RAF Leuchars**, Fife
13. **DIO Ops Training Home Counties**, Hampshire
14. **HMS Excellent**, Whale Island, Hampshire
15. **Newtown Range and Jersey Camp**, Isle of Wight
16. **DIO Ops Training South East**, Kent and East Sussex
17. **Air Weapons Range Donna Nook**, Lincolnshire
18. **Air Weapons Range Holbeach**, Lincolnshire
19. **Altcar Training Camp**, Merseyside
20. **Caerwent**, Monmouthshire
21. **Stanford Training Area**, Norfolk
22. **Otterburn**, Northumberland
23. **Castlemartin**, Pembrokeshire
24. **RNAS Merryfield**, Somerset
25. **RAF Lakenheath**, Suffolk
26. **Pippingford Park**, East Sussex
27. **Thorney Island**, West Sussex
28. **Bulford**, Wiltshire
29. **Imber**, Wiltshire
30. **Larkhill and Westdown**, Wiltshire
31. **Winterbourne Gunner**, Wiltshire
32. **DST Leconfield Carrs**, East Yorkshire
33. **Catterick**, North Yorkshire



34. **Ripon Parks**, North Yorkshire
35. **Sovereign Base Areas**, Cyprus
36. **British Forces Gibraltar**, Gibraltar

37. **British Forces South Atlantic Islands**, Falklands



Spotlight on... MOD Pendine, Carmarthenshire



Coastal view from the east lookout © QinetiQ

Hidden amongst the dramatic coastal landscape of the South West Wales coastline on a Site of Special Scientific Interest (SSSI) is Europe's longest Test and Evaluation Track? Here at MOD Pendine the Ranges and Test Track are managed by QinetiQ as part of the Long Term Partnering Agreement (LTPA).

Since the summer of 1940, MOD Pendine has been an establishment to the Test, Evaluations and Training support to the armed forces in a land area of 20.5km² which consists of numerous different Ranges, each with individual capabilities. The section of coastline is known for its high tidal range of up to 8m and the 9km of shoreline has been used in the past for aircraft landing training sorties, whilst the large Sea Danger Area stretches over approximately 18km², and the Air

Danger Area extends up to 23,000ft. Pendine was designated a Site of Special Scientific Interest (SSSI) and Special Area of Conservation (SAC) for the coastal habitats; sand dunes, grazing marsh and one of Wales's most important freshwater pools all occur within the Pendine estate. Water voles live in the ditches, otters and waterfowl inhabit the freshwater lake, hares and deer use the sand dunes, wintering waders feed along the shoreline and common scoter feed just offshore in the winter. Pendine Sands and Laugharne Burrows also form part of a Geological Conservation Review Site (Carmarthen Bay; GCR site no. 2102) for its natural processes and anthropogenic modifications.

Since taking up my post as Community and Environmental Liaison Officer at MOD Pendine in early autumn 2012

I have jumped in with both feet to progress the Integrated Rural Management Plan (IRMP) and re-establish the Conservation Group.

The Conservation Group met in October 2012 for the first time in seven years to discuss past, current and proposed future management on the site as part of the Pendine IRMP. A number of organisations such as Natural Resources Wales, Carmarthenshire Biodiversity Partnership, Sea Trust and local experts have advised and contributed to the positive management of the habitats. We hope that over the next couple of years the management and detailed monitoring of the site will evolve into an established database providing greater knowledge of what is present on the area. For example there are a few small herds of deer which we believe

are sika deer *Cervus nippon* that escaped from a local wildlife park in the 1970s, that we would like to survey and understand their breeding and movements around the site.

We recently embarked on a significant Scrub Management Programme in the spring of 2013 to help restore dune habitats and try to encourage the presence of fen orchid *Liparis loeselii* and petalwort *Petalophyllum ralfsii*. This programme involved in the treatment and removal of 24 acres of sea buckthorn *Hippophae rhamnoides* from the Eastern end of the Range.

The dune slacks have been actively restored using a scraping method - these are an important habitat which forms between the ridges of the dunes where the surface is close to the water table, but many have been degraded by scrub invasion and lack of grazing. The scrape method removes the top layer of the soil down to the winter water table, exposing a fresh slack to encourage positive slack growth.

Defence Infrastructure Organisation (DIO) and Natural Resources Wales are also working with local tenant grazers to ensure that the graziers marsh and dune habitats of the SSSI are grazed appropriately, encouraging the natural dune habitat to rehabilitate.

The latest survey by our Bryophyte expert from Natural Resources Wales has shown that Pendine has a number of nationally scarce moss species such as the drepanocladus moss *Drepanocladus sendtneri* and new populations of petalwort.

Witchett Pool is an important water body within the Range, providing a home for wintering and breeding birds, otters *Lutra lutra*, water voles *Arvicola terrestris* as well as many other vertebrates and invertebrates. In recent years reeds have started to encroach the open water, so in the winter of 2012 with the help of a specialist reed cutting boat and a team provided by Natural Resources Wales, the reeds were cut back over three days to create more open water. Since the area of open water has increased there has been more noticeable animal activity with birds and otters using the lake.

Another smaller on site project that is a personal journey for me, is the installation of a bee hive on site as part of a QinetiQ funded STEM (Science, Technology, Engineering and Maths) project which we intend to use for teaching natural science to the local primary schools. The area for keeping the bees has been chosen, the hive bought and assembled ready for a delivery of Buckfast bees this summer.

I am currently learning the art of bee keeping with my head in the books and a little help from an experienced keeper so hopefully by the time you are reading this we will have our first lot of Pendine honey.

Katie-Jane Martin

MOD Pendine Environmental and Community Liaison

www.pendine.qinetiq.com



Otter © Crown



Specialist reed cutting boat © QinetiQ



Anglesey RAF Valley



RAF Valley coastal clean event © Crown

RAF Valley is situated on the Isle of Anglesey - Ynys Môn, North Wales. Located in an Area of Outstanding Natural Beauty (AONB). RAF Valley is surrounded by 11 Sites of Special Scientific Interest (SSSI), 3 Special Protection Areas (SPA), and 2 Special Areas of Conservation (SAC).

Regular readers of Sanctuary may recall last year's article highlighting RAF Valley's "adoption" of a section of the Isle of Anglesey Coastal Path* on 26th April 2012. Under the terms of the Memorandum of Understanding agreed with Cyngor Sir Ynys Môn - Isle of Anglesey County Council, RAF Valley has committed to undertake annual surveys to monitor the condition of the path. A path survey carried out on the 23rd May 2013 by the Coastal Path Project Officer (Mr Rob Hughes) and the deputy Coastal Path Project Officer (Sgt Em Horsman) identified large amounts of accumulated waste along the adopted stretch of path. Significant amounts of flotsam and jetsam had also been deposited, along the adjacent stretch of Cymran Beach, over the preceding winter months.

To help fulfil the Station's stewardship role towards the local environment and also to raise awareness of the Coastal Path, an RAF Valley Coastal Clean event was held on 19th June 2013. The event also had an important Air Safety dimension involving the effective removal of large amounts of potential Foreign Object Damage (FOD) debris located right on the door step of an active airfield. At the event volunteers from across RAF Valley, Service and civilian, supported by partners from Isle of Anglesey County Council and Friends of Anglesey Coastal Path, successfully collected, bagged and removed 1.28 tonnes of waste from the path and nearby beach.

This impressive haul of waste would not have been achieved were it not for the enthusiasm and concerted effort of all participants on what proved to be one of the hottest days of the year so far. It was also an excellent example of RAF Valley working in close partnership with local stakeholders to enhance the state of our environment and our mutual enjoyment of it.

Further path surveys are planned for the coming months, with a follow up coastal clean event envisaged towards the autumn, prior to the onset of winter storms. Future plans also include the possibility of extending the adopted area of path up to the local village of Four Mile Bridge giving a total adopted area of 5.6 miles (9 km).

**Isle of Anglesey Coastal Path is a 125 - mile (200 km) route that circumnavigates the island, passing through the largest designated Area of Outstanding Natural Beauty in Wales. © Isle of Anglesey Coastal Path Project 2011.*

Isle of Anglesey Coastal Path
<http://www.angleseycoastalpath.co.uk>

Robert Hughes
Station Environmental Protection
Advisor (SEPA) and Coastal Path Project
Officer



A few more bags and the job's done © Crown



Just part of 1.28 Tonnes of waste removed from the path and nearby beach © Crown



Buckinghamshire

RAF Halton



Even the timid bank vole is recorded on the RAF Halton species list © Cpl Jamie Peters

As I write this article, we are undertaking a Phase 1 Habitat survey across the site. Armed with the JNCC manual, a load of books and a small amount of training, the team set out to identify key species and to eventually classify the different habitats within the various areas of the Station. We have some historical data from previous surveys to compare our findings too and so far, although the majority of plant species marry up reasonably well, it seems some of the previously regular species such as the bee orchid and common blue butterfly have not appeared this year, much to our disappointment. The exception is the white helleborine which was found to be growing in abundance within one of our grassland training areas under the cover of some large hybrid poplars. Amongst other species we've found so far are bladder campion, red clover, common bird's foot trefoil, dove's foot cranesbill, wood cranesbill, wood forget-me-not, lesser trefoil, selfheal and some flowers more commonly

found in gardens-aquilegia 'nora barlow' and dark columbine included! A small number of small blue butterflies and a cinnabar have been seen in one grassland area; however, these do not seem to be common to the rest of the site surveyed so far.

The information we gather this week will be used to form a new section of our Environmental Management System; our plan is to draw up and put into practice a management plan for our grassland areas. It is hoped this will improve their biodiversity and viability as habitats and also encourage the return of some of the species previously found in the area. The information gathered will also influence the future activities of the Conservation Group

We are currently working with DIO to put a woodland management plan in place for the site's woodland areas, not just to improve them as habitats but to also to improve them as training areas. We are a training establishment after all!

Meanwhile, red kites continue to do well here and our population is increasing as they steadily move in across different areas of the Station. We also have a pair of buzzards living within one of our woodland sites and tree creepers in another. Deer are on the increase and we now have confirmed roe deer, muntjac deer and chinese water deer living on or travelling through the site. In other areas, we have bank voles, a large population of badgers, smooth and palmate newts (but no great crested unfortunately).

So for now, we will continue our survey, next year hopefully there will be some good news to report as we progress towards the implementation of our management plans.

Emily Haddock
Station Environmental Advisor



Camarthenshire

Air Weapons Range Pembrey



Dune gentian *Gentianella uliginosa* thriving on the helipad at Pembrey AWR © Richard Pryce

Air Weapons Range Pembrey is situated on the Pembrey Peninsula between Llanelli and Carmarthen in West Wales. The site comprises an extensive area of intertidal habitat, grazed saltmarsh, sand dunes and transitions between them.

During World War II the long flat beach of Cefn Sidan was considered an ideal point for a possible invasion and several emergency beach defences were constructed which were also part of the broader defence scheme associated with the Carmarthen Stop Line that ran from Pembrey to Llangrannog. Over time some of these structures were completely hidden by the encroaching scrub and they disappeared from view.

The range area underwent significant scrub removal in 2005 which revealed a brick built 'pill-box' near the control tower and another of identical construction at the northern end of the Range. There were still two buildings on the Range that were hidden but their

positions could clearly be seen on maps but the sea buckthorn scrub had become so impenetrable it was impossible to find them on the ground. In 2012, an intrepid team including Jon Berry from CADW and Sqn Ldr Guy Jeffs found the missing structures after a two hour search. During the search Jon Berry also rediscovered a WWII slit-trench by falling in it. Further scrub clearance that year cut a route to the buildings, which means that they can be easily reached. According to CADW the pillboxes are unique in Wales and almost certainly in the UK and they are now likely to become scheduled monuments.

Dune gentian *Gentianella uliginosa* remains one of the priority species for conservation at Pembrey AWR. It was first recorded in Carmarthenshire in damp sandy ground on Pembrey Burrows by Marshall in 1899. Since that time, natural changes to this very mobile dune system, together with the afforestation of much of the dune

system (Pembrey Forest) has resulted in a severe reduction of the short-turf, dune-slack habitat required by the gentian.

Since about 1970, the one place that it could reliably be seen was, and still is, the helipad at Pembrey AWR. Here, there have been several dozen plants flowering in most years in short turf maintained by the ground maintenance contractors, indeed there is evidence of an increase in plant numbers in recent years. Attempts are now being made to extend suitable habitat into other areas by amending grassland management. A notable success was achieved in the summer of 2012 with a few plants found at a new site some distance from the original population.

Much work has been done in the last two years by Sam Bosanquet, a lower plant specialist working for Natural Resources Wales and a member of the MOD Conservation Group. He has made several visits to the site to identify rare bryophytes (mosses and liverworts) and his work has shown that the diverse ground conditions mean it remains amongst the most important dune systems in Wales for this often overlooked group. He has recorded a number of scarce species including the nationally rare *Bryum marattii* and the nationally scarce *Bryum warneum*, *Amblyodon dealbatus*, *Drepanocladus sendtneri* and *Campyliadelphus elodes* amongst others.

Oliver Howells CIEEM

Ecologist

Defence Infrastructure Organisation



County Down

Ballykinler



Ballykinler coastal view © Crown

No Boundaries for Biodiversity at Ballykinler

The idea that biodiversity knows no boundaries was one of the guiding principles behind a major initiative to promote wildlife and nature across the whole of the East Border Region of Ireland. 'Action for Biodiversity' is a three-year project funded by the European Union's INTERREG IVA Cross Border Programme and is working with ten local authorities across the Border Region.

The three themes of 'Action for Biodiversity' are biodiversity awareness projects, capacity building and practical on-the-ground conservation schemes. These have all been tackled in the local authority areas with partners ranging from schools to youth groups, tidy towns to hospitals and from the local authorities themselves to individual volunteers. Across the whole 7,000km of the region a one off and unique partnership came about when the Commander DIO Ops Training, Northern Ireland (DIO Ops Trg NI), Major

Tony Canniford invited Abby McSherry, the Action for Biodiversity project officer for the area onto the Ministry of Defence land holding, at Ballykinler Training Centre, County Down, across the bay from the Mountains of Mourne.

"Nature knows no boundaries. A trout does not know which side of a human political border it is on, a hare will cross local authority limits in ignorance and a butterfly will flutter into a military firing range, oblivious of the fences and politics of Ireland, and yet the practical protection offered to these species, the way their habitats are cared for and even the knowledge of their importance is highly dependent on where they find themselves." said Abby McSherry. Abby explained that Action for Biodiversity was working with a local conservation group at a seal nursery beach and they had suggested there was a huge potential for nature conservation projects at Ballykinler due to the active conservation group and the protection it offered. Following a site visit it was obvious there were several micro-projects that were

begging to be done; they just needed some organisation and seed money to start.

The site at Ballykinler is an ASSI (Area of Special Scientific Interest, equivalent to an SSSI in Britain), with plants, animals and birdlife exploiting the relative peace of the training areas. Ballykinler and the neighbouring area of Murlough (owned by the National Trust), just across Dundrum inner bay, make-up one of the largest and most important dune systems in Northern Ireland. Over the years there has been a lot of co-operation between Ballykinler Training Centre, the Northern Ireland Environment Agency and local nature conservation bodies, such as Tara Seal Research, Butterfly Conservation NI and the Ulster Wildlife Trust, working on surveys and small conservation projects, but more could be achieved and with the assistance of Major Tony Canniford these gaps could be plugged.

Bats and barn owls were identified by Abby McSherry as possible priority

AROUND THE REGIONS

species; these are charismatic and popular animals and no direct management was being carried out on site to encourage them.

After consultation with The Ulster Wildlife Trust's Barn Owl officer it is now planned that DIO Ops Trg NI staff and local families on the base will build a dozen external barn owl boxes and put them up in woodland around the range complex during 2013, three or four internal boxes will also be erected in various agricultural buildings. Abby McSherry warned that "erecting barn owl boxes isn't like putting up blue tit boxes up, where you can be pretty sure occupants will move in soon after". Barn owls are very rare in Northern Ireland and even creating nesting sites and perching posts does not guarantee occupation. However, there are barn owls near Ballykinler and the rough

grazing in the area is perfect hunting habitat for them, so our fingers will be crossed over the next few years that we will get some visitors.

Other old buildings at Ballykinler will also be made into "des-res" for wildlife; such as the abandoned pillboxes dating from the Second World War. Currently these only attract local children on firelighting and den building adventures where there is significant risk of injury but an alternative use, as bat hibernacula, will prevent children getting in, while providing a safe, cool and sheltered environment for the bats to spend the winter. The doors will be blocked, except for letterbox-sized openings and the interior will be lined with Kent bat boxes and wooden slats to provide sheltered niches for the bats to cling to. Plans for these alterations are being provided by a bat ecologist

with the Northern Ireland Bat Group, who will also run a series of bat evenings for families on the base during the summer.

"Ballykinler Training Centre is a wonderful biodiversity resource and through working with the staff on the base and other nature conservation organisations and with a little funding from Action for Biodiversity, that resource will be improved over generations to come. Hopefully future users of the firing range will catch glimpses of barn owls and bats and these lovely nocturnal creatures will cross the boundaries of the base knowing only that there is good feeding and good homes inside the fence lines".

Abby McSherry

Action for Biodiversity Project Officer
INTERREG IVA Cross Border Programme

DIO Ops Trg NI Provides much needed support to hill farmers

In late March, due to the prolonged heavy snowfall in the South Down area around Dromara, Castlewellan and Slieve Croob, thousands of sheep were left stranded without feed in isolated areas, inaccessible by over-land means. The Commander DIO Ops Trg NI was tasked by HQ 38 (Irish) Bde, in response to a request from the Department of Agriculture and Regional Development (DARD), to assist with a Military Aid to the Civilian Community (MACC) operation. Support helicopters working out of DIO Ops Trg Ballykinler Training Centre (BTC), were used to supply much needed feed to the hill farmers. Two Agusta Westland AW139 helicopters, from 301 Squadron of the Air Corps from the Irish Defence Force, arrived within 24 hours to start operations, along with a UK CH47 helicopter operating out of Aldergrove Station.

On the morning of 28th March 2013, DARD arrived with a low loader carrying bales of hay and high-energy food supplement that farmers in affected areas had requested via the DARD help line. By mid-morning the two Irish Defence Force helicopters, with their ground crew arrived on the range complex at Ballykinler, and together with UK personnel, supported by DIO Ops Trg staff, began an under slung helicopter operation, lifting two

bales of hay and the feed supplement and delivering their vital consignment to the waiting farmers out on the snow laden hills.

During the operation a helicopter was tasked, by NI emergency services, to carry out a Search and Rescue and successfully found and winched two ice climbers to safety from the mountains overlooking DIO Ops Trg Magilligan.

This was the first time that the IDF (specifically the Irish Air Corps) and UK personnel had operated together as a

combined team in a live operation within the British Isles since the Irish Air Corps where established in 1922. (Note: The Irish Coast Guard (IRCG) can and does cover both DIO Ops Trg Ballykinler and Magilligan range complexes in the event of an emergency and a request for air medevac).

The operation was a complete success bringing the much needed food relief to the isolated farms and hilltops.

Maj A J Canniford R IRISH
Commander DIO Ops Trg NI



Helicopter delivering aid to the farmers; lifting two bales of hay and the feed supplement © Irish Defence Force



County Londonderry

Magilligan



Scarce crimson and gold moth © BCT

Another Piece of the Puzzle

The sand dune system at Benone is managed by Limavady Borough Council, and forms part of the wider Magilligan system that also includes the dune system at Defence Training Estates Northern Ireland Range Complex Magilligan which is recognised and protected at National and European level.

These dunes are important because they are relatively untouched and play host to a great variety of biodiversity, including the scarce crimson and gold moth, dark green fritillary butterfly, devil's-bit scabious, pyramidal orchids and irish hare to name a few.

The council recently secured funding to replace the fencing in two paddocks at the Benone end of the range complex to allow some light winter grazing which will help retain the fantastic diversity of plants. The long term aim is to protect and enhance this area both

for the wildlife and the people; by putting up fencing, gates and styles so everyone can enjoy this site.

In developing this project, we received invaluable advice from the Northern Ireland Environment Agency and the MOD (DIO Ops Trg NI) who are already managing their area of the Magilligan dune system using conservation grazing and with Benone coming on line another piece of the puzzle is in place, so the management of the whole system is complementary.

A major benefit of managing the Benone/Magilligan dunes system in this holistic manner is the opportunity to continue to share knowledge, expertise and support each other in protecting and enhancing this unique site for biodiversity and for people to enjoy long into the future. The Magilligan Conservation Group is an active and open group that pulls on national and local expertise to support their conservation plan. This continues to ensure that the good work already achieved by the MOD at Magilligan is the foundation for conserving and enhancing our outstanding local biodiversity.

The launch of the Causeway Coast and Glens Council Cluster Local Biodiversity Action Plan in February 2013 also marked a very positive milestone for biodiversity conservation in the Limavady area, and include the MOD site at Magilligan. The Conservation Group at the DIO Ops Trg, Magilligan site is also part of the cluster partnership.

This is a significant step in biodiversity conservation for the four Councils (Ballymoney, Coleraine, Limavady and Moyle) and for DIO Ops Trg Magilligan; it will also promote and raise awareness of the exceptional biodiversity we are

lucky to have in this area and but it also heralds the next steps in looking after our biodiversity, the implementation of this action plan.

DIO Ops Trg NI is already contributing to this action plan with its dune conservation management and in particular its work in partnership with Butterfly Conservation to monitor and manage the habitat for the small eggar and scarce crimson and gold moths along with a dunes improvement plan.

If you would like a copy of the LBAP document they are available from the four Council offices or if you would like to find out more about the biodiversity work in your area please contact Rachel Bain, Biodiversity Officer at Limavady Borough Council on: rachel.bain@limavady.gov.uk

Rachel Bain
Biodiversity Officer
Limavady Borough Council





Devon Lympstone



Royal Marines taking part in the himalayan balsam pulling day © Guy Newman

It has been a busy few years on East Devon's Pebblebed heaths. The latest condition assessment by Natural England published in 2012 has again highlighted the improving nature of the core area of this unique lowland heathland, with Woodbury and Aylsebeare Commons now classified as being in a favourable state. To ensure that the condition of adjacent Commons areas also continue to improve, conservation grazing with rare breed cattle and ponies is currently being expanded, with the Planning Inspectorate approving plans to fence significant areas of the Pebblebed heaths in 2012. Conservation grazing is recognised as one of the best means of maintaining the biodiversity of heathlands, and replicates grazing undertaken by the Commoners of old. The approval to permanently fence the boundary of some Commons followed a long and comprehensive consultation phase which started in 2009.

Covering over 1,200 hectares, the East Devon Pebblebed Heaths are one of the largest remaining expanses of lowland heathland in the south west. The core area of this amazing wildlife area is generically known as 'Woodbury Common'. However it comprises a series of many adjoining parish Commons. These include Dalditch, East

Budleigh, Bicton, Woodbury, Colaton Raleigh, Hawkerland, Aylesbeare and Harpford Commons. These are all owned by Clinton Devon Estates, with the majority of the area managed for wildlife and public enjoyment by the Pebblebed Heaths Conservation Trust.

The Commons have long been associated with the Royal Marines who have a lease to train there. Although modern-style military exercises on 'Woodbury Common' date back to the late 18th century, it was with the establishment of Dalditch Camp in 1941 that the connection was forged in public consciousness. At its height, over 5,000 personnel were stationed at this massive training camp, with many hundreds of buildings dotting the landscape of East Budleigh Common. Although nature has largely reclaimed this famous training ground, footprints of the buildings remain hidden in the undergrowth, with some structures now acting as important hibernaculae for such endangered species as lesser horseshoe bats. The site remains one of the best in the UK for butterflies, including the elusive silver-studded blue which favours early pioneer heathland.

Over 70% of European heathlands have been lost to development over the last

200 years. Due to their wildlife value and the rarity of this ecosystem, the core area of the Pebblebed heaths are designated as a Site of Special Scientific Interest, a Special Area of Conservation and a Special Protected Area. As such they sit at the top of the hierarchy of European conservation sites and there is a legal obligation to return them to a favourable conservation status.

Around 750 Royal Marines pass through Lympstone Training Centre every year, with a significant part of their activities spent on the Pebblebed heaths. The Marines are an important conservation partner of the Pebblebed Heaths Conservation Trust. Not only do they provide a useful policing presence, but their assistance on conservation initiatives has proved invaluable. Their latest significant contribution has been working with the Conservation Trust and local community groups in June 2013 to help drive back the invasive himalayan balsam *Impatiens glandulifera* which has been creeping up the tributaries of the River Otter towards the heaths, and their own treasured training ground. Their assistance with this endeavour is much appreciated, and we look forward to many more decades of constructive collaboration.

Dr Sam Bridgewater
Conservation Manager
Clinton Devon Estates



Landscape view across Woodbury Common towards Woodbury Castle © Dr Sam Bridgewater



Dorset

Bovington and Lulworth



A Dartford warbler in classic singing pose on gorse © Geoff Jones

Despite one of the wettest summers in many years the Bovington & Lulworth Conservation Group members were as active as ever in 2012. The poor weather undoubtedly had a big impact on breeding success for a whole range of taxa and not least the birds. An extensive nest box recording scheme has been running at Lulworth Ranges for many years but this year the wet weather has had a major negative impact on breeding success and very few chicks were fledged from the boxes. More promisingly Dartford warblers were recorded in good numbers across the heathland but the bad weather curtailed efforts to colour ring them. The weather did not prevent some other important surveys that showed the population of nightjars has increased significantly following the start of a major heathland restoration project at Highwood where the recent felling of a plantation has brought in at least four new territories. Four birds were ringed just in this area during one evening in 2012.

The group also took part in the BTO Nightingale Survey at Lulworth but numbers were shown to be significantly down on past years with just two singing males, though this is more likely to reflect changes in the habitat than short term weather effects. Woodlark and stonechat are still well represented on the Range with skylark and common migrant warblers such as blackcap, chiffchaff, willow warbler also recorded in good numbers, although breeding success was again thought to be poor. Sand martins continue to nest in the china clay pit although the nests move around as the pit gets worked and numbers are lower than in the past.

To continue the bird theme a survey of breeding seabirds was carried out at Lulworth Ranges in 2012 in partnership with National Trust, Durlston Country Park and Lulworth Estate. The high cliffs along this dramatic Jurassic Coast support small but significant numbers of breeding seabirds and many people are surprised to learn that Dorset has its

own small colony of breeding puffins, though not on the MOD estate. The survey did show that Lulworth Ranges supports breeding colonies of cormorant, shag and herring gull. Nearby there are colonies of kittiwake, razorbill and guillemot. Some are vulnerable to disturbance from climbers, kayakers and coasteering groups along this coastline, but far less so on the Ranges.

Despite the limitations on access a small group of volunteers continue to help with dormouse surveys at Lulworth Ranges. The weather undoubtedly had a major impact on breeding success across the country for this charismatic animal in 2012. The same can be said of our population with just 14 dormice recorded in the 50 purpose built nest boxes in the 2012 season compared to 35 in the previous year. The absence of any animals in the boxes during October and November suggests there were very few juvenile animals fattening up for the winter hibernation.

Conservation group members continue to monitor invertebrates and reptiles at Bovington. Recent surveys using malaise traps have produced good records for some of the heathland insects when compared with similar surveys carried out almost ten years ago. A survey of the ponds on Wool Heath found previously unrecorded species including the largest species of pond skater and an uncommon diving beetle. Other freshwater species will benefit from the two new ponds dug in 2012 by Amphibian and Reptile Conservation. These were created to benefit early successional plants and insects and they were dug as part of the UK-wide Million Ponds Project.

Lt Col (Retd) Christopher Donaghy
Bovington & Lulworth Conservation
Group Chairman



Essex Colchester



Essex Wildlife Trust staff and volunteers hard at work clearing the cherry laurel © Essex Wildlife Trust

Essex Wildlife Trust staff and volunteers have been working hard over the winter clearing large stands of exotic cherry laurel *Prunus laurocerasus*, which was suppressing ground flora over a large part of Friday Woods North Local Wildlife Site, on the outskirts of Colchester.

Local Wildlife Sites (LoWS) are selected for their local nature conservation value and are the most important places for wildlife outside legally protected land such as Sites of Special Scientific Interest (SSSIs) and nature reserves.

LoWS play a critical conservation role by providing wildlife refuges, protecting threatened species and habitats, and acting as buffers and wildlife corridors. Their designation is non-statutory and their only protection comes via the planning system. While SSSIs are a representative sample that meet national criteria, LoWS include all sites that meet local selection criteria.

Friday Woods North Local Wildlife Site covers 3.5ha and comprises the part of Friday Woods which is not included within the Roman River SSSI. The site is included in the Ancient Woodland Inventory compiled by Natural England and contains BAP priority habitats

Lowland Mixed Deciduous Woodland (UK) and Ancient Woodland (Essex).

The canopy is largely pedunculate oak *Quercus robur* and downy birch *Betula pubescens*, with some sweet chestnut *Castanea sativa*, ash *Fraxinus excelsior* and hazel *Corylus avellana*. The ground flora across large areas of the wood is being heavily suppressed by large stands of cherry laurel, which creates dense shading of the woodland floor.

In the more open areas wood sage *Teucrium scorodonia*, bracken *Pteridium aquilinum*, bluebell *Hyacinthoides non-scripta* and bramble *Rubus fruticosus* agg. proliferate.

Remote sedge *Carex remota*, honeysuckle *Lonicera periclymenum*, three-nerved sandwort *Moehringia trinervia*, primrose *Primula vulgaris*, lesser celandine *Ranunculus ficaria* and stinging nettle *Urtica dioica* are also present.

Essex Wildlife Trust staff and volunteers used chainsaws and hand tools to fell the cherry laurel, which was up to 30ft high in places. Arisings were then burnt on site and stumps treated to limit regrowth.

Care has to be taken when working with cherry laurel as the leaves and fruit pips contain cyanolipids that are capable of releasing cyanide and benzaldehyde during maceration. Cyanide starves the central nervous system of oxygen and, thus, causes death. Chipping is therefore not recommended.

Cherry laurel has enough of the poison in the leaves to be used by entomologists as a way of killing insect specimens without physical damage, by sealing the live insects in a vessel containing the crushed leaves.

The work clearing the cherry laurel will take a number of years and further work parties are already being planned for next winter. If you live locally and would like to volunteer please contact John More, Local Wildlife Sites Officer for Essex Wildlife Trust, on 01621 862988 or at johnm@essexwt.org.uk

John More
Local Wildlife Sites Officer
Essex Wildlife Trust



Burning the arisings on site © EWT



Bluebells © Crown



Essex

MOD Shoeburyness



The diversity of habitats within SSSI unit 4: borrowdyke, sea wall, grassland and scrub © QinetiQ



Some of the scrub cleared this year © QinetiQ



Restored grassland now managed by the Officers' Shoot © QinetiQ

Commencing February 2013, a long-term programme of scrub clearance began on MOD Shoeburyness. This programme is a joint venture between MOD, Natural England and QinetiQ and has involved stakeholders such as the Officers' Shoot. MOD Shoeburyness is situated on the east coast, at the mouth of the Thames Estuary. Much of the site has been designated as two Sites of Special Scientific Interest (SSSIs) which are divided into management units. The management of these units is focussed through the site's Integrated Rural Management Plan (IRMP).

This IRMP highlights SSSI unit 4 as a target for scrub management as in recent years, the unit has become somewhat overgrown with scrub. This needs to be reduced by approximately 50% to create around 25% of managed scrubland and 65% grassland.

Unit 4 is also designated as part of the Foulness Special Protection Area (SPA) for birds and Ramsar site for

internationally important wetlands, as well as at its south-eastern edge, part of the adjacent Essex Estuaries Special Area of Conservation (SAC) for habitats. It is a large unit, approximately 88ha in size and received its designations for its important sea wall, borrowdykes, ditches and brackish pools, as well as its mosaic of scrub and grassland. The unit provides good habitat for a range of invertebrates, as well as wintering, passage and migrant birds.

This unit is currently licenced for use by and receives some management from the Shoeburyness Officers' Shoot. This beneficial management creates rides of managed grassland interspersed with scrub. This is not only valuable to wildlife, but allows the shoot members access to the pheasants during the shooting season (October to end-January).

Through consultation with all interested stakeholders, additional scrub clearance by the QinetiQ grounds maintenance

team this February has opened up some more of the rides. This is allowing the SSSI unit to move back towards favourable conservation.

In the long-term, it is hoped to graze the grassland areas. Grazing would be beneficial because it would improve the area for species associated with coastal grazing marsh including those for which the site was designated. Proposals for grazing will need to consider the operational requirements of the area, the nature conservation objectives, the potential impact on the Officers' Shoot, and practicalities such as access for checking stock, fencing, unexploded ordnance and military debris.

Emma England
Ecology Assistant
MOD Shoeburyness Range



Essex

MDP HQ Wethersfield



Officers, staff and families at the official opening of the Wethersfield Kitchen Garden - June 2012
© Rosalind Gourgey

A Diamond Jubilee Wood has been planted at the Headquarters of the Ministry of Defence Police (MDP) at Wethersfield, to celebrate each year of HM The Queen's reign. This exciting project continues our royal connections; in 1993 HRH The Princess Royal, Jubilee Wood Patron, officially opened Wethersfield as the MDP Headquarters. There are only 60 Diamond Jubilee Woods in the UK, only one in Essex, and just two on MOD land.

Our original plan with the Woodland Trust (WT) for a 7ha planting was cancelled owing to financial cutbacks. However, a timely new tree planting agreement between MOD and the WT gave us hope. After lengthy negotiations, guided by DIO Head Forester, Jon Watson, the MDP signed a tripartite licence with DIO and the WT. This enabled us to start planting our 79ha Jubilee Wood, thanks to Forestry Commission grants and commercial sponsorship.

Children from eight local primary schools planted 600 trees and enjoyed

nature activities with WT staff in Park Wood, calculating the age of trees and building animal shelters. On our Community Planting Day staff, residents and local villagers planted 648 trees in two hours! Local press ran the story. Commercial sponsors also got dug in and already local schools, wildlife enthusiasts and the community are planning return visits. A commemorative Jubilee Oak has been donated by Braintree District Council.

36,000 saplings were planted by February 2013. The exact mix of UK-sourced native species took into account Forestry Commission advice on ash dieback disease, *Chalara fraxinea*. The 40ha of planting include rides and glades to accommodate training on MOD land.

Rosalind Gourgey, Sustainability Adviser said: *"Our Jubilee Wood will partly restore this part of Essex to its natural wooded state, lost mainly to wartime airfield construction, and will form a continuous corridor around the airfield, linking with woodland outside the fence. Park Wood, our remaining fragment of ancient*

woodland, which could have been in jeopardy, will be conserved surrounded by the protected Jubilee Wood".

The Chief Constable and senior officers from 33 & 101 Engineering Regiments EOD, together with staff and families, celebrated the Centre's formal opening on 28th June 2012. Army residents run coffee mornings, play groups and offer family welfare advice from here. All this helps to overcome any feelings of isolation.

A proposal to create allotments proved surprisingly controversial but the sustainability adviser and enthusiasts allayed any concerns. The final pegged area turned out to be a horticultural challenge, but with hard work by army families, and three broken spades later, we had 12 plots, compost bins and water butts, and a Garden Society keen to start planting. Rabbit-proof picket fencing took 180 hours, and the muscle of army volunteers, to construct from recycled pallets. It is now a pleasant area where parents and youngsters enjoy growing their own fresh vegetables.

Wethersfield's Diamond Wood will be a haven for nature and will make a significant contribution towards MOD sustainability targets.

Rosalind Gourgey
Sustainability Adviser
MDP HQ Wethersfield

Judith Slater
Corporate Communications
MDP HQ Wethersfield



Fife

RAF Leuchars



Volunteers at Bankhead Moss © Crown

It was another good year for conservation at RAF Leuchars with interest being shown in the subject by Station personnel, visitors and contractors alike.

Work to replace external cladding on an ammunition store was halted when the contractor suspected that bats may be present in the building. An experienced batworker was brought in to examine the area and after looking for physical signs of bat activity, he set up sound and thermal imaging equipment to monitor the potential roost during a dusk watch. He concluded that the building housed the summer roost of a single male soprano pipistrelle. The Station was faced with two options to allow completion of work on the building:



Craig Hartle volunteers © Crown

firstly, apply for a licence to destroy the roost or alternatively wait until the bat left the area at the end of the season (late October) and fit the wall panel with a suitable hole cut in it to allow access to the roost. Happily, the Station chose the latter thus enabling Mr Bat to enjoy his summer residence for many years to come.

Summer weather was not quite such a joyous tale as torrential rain and localised flooding led to the cancellation of a number of conservation events. The Station's annual beach clean went ahead though, and even the poor weather conditions could not dampen the enthusiasm of the Station volunteers who joined the local Fife Ranger in removing plastics and other waste items that had washed ashore along a 2.5 km stretch of the Eden Estuary. The Estuary, which borders RAF Leuchars, is a SSSI and forms part of the Firth of Tay and Eden Estuary Natura 2000 site.

Volunteers from the Conservation Group were also busy working at two other local SSSI sites. Firstly, they assisted with bracken control in the Craig Hartle site adjacent to the

Fairmont Golf Course, St Andrews, this project aimed to promote biodiversity and safeguard valuable habitats that had been shaded out by the highly invasive spread of bracken. The volunteers spent most of their time crushing the bracken stalks with some lethal-looking thin metal rods to starve the plants of nutrients; the remainder was taken up explaining the project to numerous bemused golfers.

Secondly, the volunteers headed to Bankhead Moss - a small raised peat bog with a typical dome-shaped profile. The bog centre is largely open although tree seedlings, especially birch, are colonising it and drying out the reserve. The Conservation Group assisted the Scottish Wildlife Trust in the control and removal of these young trees.

Both projects required a great deal of physical effort. The volunteers made significant inroads into both the bracken and birch problems and were duly deserving of the praise given to them by the Scottish Golf Environment Group, the Fairmont Golf Course and the Scottish Wildlife Trust.

KC Campbell
Conservation Officer



Mark Taylor at Craig Hartle © Crown



Hampshire

DIO Ops Training Home Counties



Marsh clubmoss has been rediscovered, and is thriving at Long Valley, part of the Aldershot Training Area
© Alex Cruickshank, Hampshire and Isle of Wight Wildlife Trust

Marsh clubmoss *Lycopodiella inundata* on the Aldershot Training Area

It is not the most impressive of rare plants - it does not have the wow-factor of a carpet of bluebells or the flamboyant beauty of a lady's slipper orchid - but marsh clubmoss is just as deserving of our conservation efforts. Not a moss at all, but actually a fern, it resembles a bright green, inch-long caterpillar crawling across the wet, peaty soil.

In the UK this plant is considered 'Nationally Scarce', having disappeared

from over 75% of its former range. Its strongholds are the west coast of Scotland and the New Forest but it also has a small, but significant, outpost on the heaths of north Hampshire.

If you are in the right place you can find marsh clubmoss on wet, boggy areas where the vegetation has been kept short, or almost non-existent, by low levels of disturbance such as vehicle movements or livestock grazing.

At Long Valley, part of the DIO Ops Aldershot Training Area, marsh clubmoss was known to be present until the 1980s, but became extinct

because of too much tree cover. In 2001, a significant area of this tree cover was removed to meet safety regulations for the nearby Farnborough Airport, when it was passed from military to civilian use. Removing the trees caused ground disturbance - the ideal conditions for marsh clubmoss. In 2004, the plant was rediscovered on an area of bare peat created when the trees were felled, 69 individual plants were counted here during an intensive survey in 2005.

When conservation grazing was introduced to large parts of the Aldershot Training Area under a partnership project between DIO and the Hampshire and Isle of Wight Wildlife Trust, marsh clubmoss was seen as a target species, with objectives to increase its extent.

The project has been a success at Long Valley, with an increase to at least seven known patches totalling over 100 plants; the most recent patches found in early summer 2013.

The cattle - a herd of British Whites - do a great job of keeping the vegetation low and creating the bare, muddy patches needed by the marsh clubmoss. Mechanically dug scrapes, undertaken by Plantlife, have created further peaty areas, which are maintained by the grazing and trampling of the cattle.

Hopefully, with continuing management, this diminutive plant will continue to go from strength to strength and be found across the heathlands of the Army training areas in the Home Counties.

Alex Cruickshank
Grazing Project Manager
Hampshire & Isle of Wight Wildlife Trust



The 'nationally scarce' small red damselfly is expanding its range because of pond and scrape creation on the Minley Training Area © Elliott Fairs, Hampshire and Isle of Wight Wildlife Trust

New lease of life for Foxlease Meadows

In 2009, DIO formed an agreement with Hampshire and Isle of Wight Wildlife Trust for the Trust to manage a large part of the Minley Training Area called Foxlease Meadows. Already managing a number of units of the extensive Foxlease and Ancells Meadows SSSI, the Wildlife Trust were keen and well suited to take on such a project.

Four years down the line and the partnership is still going strong. Funded through a Higher Level Stewardship Agreement with Natural England a huge amount of work has been carried out in a relatively short time.

Large areas of secondary woodland have been cleared and grazing has been extended over nearly all of the meadows, making the grazed area now in the region of 125ha. The number of grazing livestock has been doubled, internal fencing has been repaired or replaced and ditches and scrapes have been reinstated or created.

As quickly as the work has taken place, the results have appeared all over the site.

Within twelve months of clearing secondary woodland from parts of the SSSI, we have seen the number of 'ancient meadow indicator species' increase from two to eleven. These

include bog pimpernel, sundews and many types of sedge.

The area is criss-crossed with ditches, historically dug to ensure livestock did not stray into neighbouring fields, which are permanently wet due to the high water table. Many of these ditches had become shaded under birch and alder trees where livestock were prevented from reaching the ditch edges. Having given livestock access to the ditches and removed some of the tree cover, large swathes of water violet have rapidly recolonised and odonata (dragonfly and damselfly) species, including the 'nationally scarce' small red damselfly, have moved into the newly opened up water bodies.

Frogs, toads, and smooth and palmate newts colonised ponds within three months of machinery leaving the site and have successfully spawned every year since 2011.

All of these successes have been trumped, however, by lapwings successfully rearing young, having been absent for over 20 years. The first signs of this achievement were in 2010 when a couple of adults arrived in early spring, only to move on a month later. In 2011, following large scale tree clearance, five adults arrived and stayed until June, although they did not appear to breed successfully. In 2013, following the creation of around 20 shallow ponds across the site, four adult lapwings arrived in late February and both pairs have shown behaviour

indicating they have tried to raise young. As this article goes to press, one pair of adults has been seen accompanied by three juveniles flying around the site visiting the new ponds. With more ponds planned for future years, there will be more opportunities for aquatic and water edge plants, more odonata, more amphibians and more lapwings; fingers crossed!

Barossa benefits

Barossa is the onsite training area resource for all Officer Cadets passing through The Royal Military Academy, Sandhurst. The training area is divided into two parts with a 200ha Range Danger Area (RDA) which is off limits to the public and a 350ha Dry Training Area (DTA). Both sections are a key component of the Thames Basin Heath Special Protection Area (SPA) for heathland birds. Indeed the Ministry of Defence is the key landowner in this internationally protected landscape.

The Ministry of Defence formed an agreement with the Wildlife Trusts of Surrey and Hampshire to form a grazing licence agreement across the respective counties training estates in 2006. Since then this agreement has seen over 4,500ha of the Defence Infrastructure Organisation estate move from unfavourable condition to a recovering status under Natural England's (NE) condition assessments. Populations of the three quintessential heathland species protected on the SPA are the nightjar, woodlark and Dartford warbler. They are thriving on the military estate due to concerted action by the partner organisations described below.

Barossa itself presents a unique series of challenges. The area is bordered by significant housing and suffers from a range of issues such as arson, littering and vandalism. When Natural England (NE) asked Surrey Wildlife Trust (SWT) to implement grazing as part of the site's Higher Level Stewardship (HLS) agreement the site had to be cleared of rubbish and a fence constructed that would allow the military free access to the site and not lend itself to vandalism. Defence Infrastructure Organisation (DIO) and SWT worked carefully together to plan the fenceline and clear the route.

A small number of cattle were introduced onto the DTA in 2011. Initial results were extremely



Belted galloways © James Adler for Surrey Wildlife Trust

encouraging however there were reports of the animals being chased by youths, the cows reacted and therefore walkers reported feeling threatened.

This led to a significant public engagement exercise during the winter of 2011 and the early part of 2012. This involved onsite engagement, school work, visitor surveys and questionnaires, enhanced signage, peer reviewed risk assessments and a consistent message from the partner organisations. These included DIO, SWT, The Heathland Conservation Society, Windlesham United Charities, Crown Estate, Surrey Police, Surrey Fire and Rescue and Surrey Heath Borough Council.

This work led to the animals returning to the site in 2012. The animals were carefully monitored by SWT staff and trained volunteer livestock checkers. In total 137 livestock/public interactions were observed where people were either very close to the cattle or walking through the herd. All 137 interactions were positive and generated comments about how keen the public were to see the animals on site.

By careful partnership work and sensitive public engagement the partners have successfully introduced large animal grazing to an urban training area and started to improve the biodiversity of this stunning site whilst continuing to allow unfettered military training. Hopefully over the coming years the herd can continue to grow and carry on their vital conservation work across the area.

James Adler
Grazing & Land Services Manager
Surrey Wildlife Trust

Round Hill ready for the return of natterjacks

Round Hill, an area in the north-east of Woolmer Forest, has a fabulous topography and great potential for a variety of habitats, including heathland and mire. Despite these qualities it was omitted from the SSSI in 1971 and 1986. Then, as if by way of compensation, it was made a SINC (Site of Importance for Nature Conservation) in 1987.

Although now firmly within the South Downs National Park, Round Hill and contiguous land together, totals 8% of Woolmer Forest. As this site is next to an important natterjack toad area, the the Amphibian and Reptile Conservation (ARC), in discussion with the MOD, developed a vision for the area.



Natterjack toad © Crown

The plan was to develop a number of open sunny glades and maintain them for species such as reptiles. Subsequent movement between the glades would be made easier by tree removal and pine crop thinning when opportunity arose. Of particular interest at Round Hill is the area where, in about 1981, Lt Col Norman Clayden (MOD's first conservation officer) heard natterjacks calling. Thirty years on and overgrown the site looked unlikely ever to have supported natterjacks, but in the 1980s it had been very different as a 1987 botanical report confirmed.

ARC, with permission from DIO and funding from various sources, made arrangements for restoration work to begin in autumn 2010. As contractors removed trees, scrub and plant debris all was revealed: a gently sloping hillside where heath might return and natterjacks hunt; a slowly eroding sandy cliff where they could burrow; a large flat area where ephemeral pools would develop with winter rains; and lastly the original seed bank.

Now, two years on, this part of Round Hill is becoming attractively vegetated colonised by invertebrates and ready to support a sub-population of natterjack toads and it is hoped that roundhill will once again become an important area for the rare natterjack.

John Buckley
ARC and Longmoor
Conservation Group



Round Hill July 2010 © John Buckley



Round Hill June 2013 © John Buckley



Whale Island, Hampshire

HMS Excellent



New hives installed with safety still in mind © Crown

The Environment Protection Advisor (EPA) for HMS Excellent, Ian Mackfall, was approached by a local bee-keeper with a view to keeping bees at Horsea Island. Ian contacted Defence Infrastructure Organisation (DIO) who control licensing and in the summer of 2011, Mr Davies was officially licensed to keep bees with Ian as the site liaison.

In summary:

"The summer of 2012 was a challenging year for beekeepers. The weather was completely wrong. The bees were surviving but that was about it.

The damp cool weather has two effects on the bees, the first is the rain washes away nectar and pollen from flower heads reducing the amount of food available and secondly like us they just want to stay in and keep warm. The Food and Environment Research Agency (FERA), the government body responsible for overseeing beekeeping standards, had issued a number of warnings with regard to inspectors reporting colonies starving. They advised beekeepers to 'Heft their hives', check food levels, and feed if necessary."

At Horsea, there was food about but not in great quantities and only enough to keep the colonies going. With a few months of sunshine this could all turn around.

The season started with three colonies. Two hives contained a Mediterranean hybrid and the other a British hybrid honey bee. The 'Med' queens where off to a lightning start with a warm March, laying eggs and the colony growing to full strength in anticipation of a spring honey flow. Meanwhile, the British queen was slowly waking up and started to lay at a very much more modest rate.

April rain caused a stumbling stop. Spring honey flow lost and hives full of bees with not much to do but eat what honey they had managed to collect. Then a warm week in May re-invigorated the bees and they began to swarm. In one week we went from three colonies to seven on site. This resulted in five hives in operation and two smaller hives called nucleuses.

As soon as it came, the weather once more broke and the rain was back.

This had a devastating effect on the newly formed colonies. Virgin queens left the hives on mating sorties and failed to return. When new queens were introduced they came to the same end.

With virgin queens it can take four to five weeks from introduction before there are signs of a healthy colony. If there is no mated queen present, the colony dwindles and eventually dies out, which can take a couple of months.

Today, there are six colonies on site, five hives and one nucleus.

Useful fact: Bees need to make approximately 22 million sorties to collect enough to make one pound of honey.

For more information on beekeeping, check out the British Beekeepers Association's web-site at www.bbka.org.uk

Ian Mackfall
EPA HMS Excellent

John Davies
Horsea Island Beekeeper



Busy bees © Iain Hamer



Isle of Wight

Newtown Range and Jersey Camp



Great spotted woodpecker © Dave Maidment

The Training Area, Range and Jersey Camp have been busy with our usual customers.

We too have been affected by the weather with constant rainfall making it wet underfoot and difficult to get anything planned done.

We had everything ready to put up our osprey platforms in March but the ground on the training area was too wet. We had to wait until September for one reason or another. The original idea was to get the platforms up whilst the ospreys were still in the area hoping they would like the accommodation made for them.

Bird accommodation! During September the 40 or so bird boxes were checked by John Willmott (group ornithologist) Richard Grogan a licensed dormouse handler and the range staff. Only one dormouse recorded this year; we think this was

due to the survey being carried out earlier than previous years. During the survey we took stock of the condition of the nesting boxes, several notes had been left by the occupants (the tit families) complaining of damp, drab and drafty housing. Being one to oblige, replacements have been made over the winter to meet their wishes. Now in place, they will have a surprise when they receive notification of a rent increase! A penthouse box has been installed in Jersey Camp for the celebrity couple who reside in the area.

I have mentioned before in other articles that we have an international interest! Sanctuary is read and enjoyed in the USA. Tom and Lisa Jones, two of our readers and friends of mine came over to look for themselves in February. Not the best time of the year for a visit; they are now satisfied that the Isle of Wight and our estate is as beautiful as described in the magazine.

Red squirrels we see every day, but not one with two legs immediately nick-named Stumpy. He seems to get around well enough and manages quite admirably with his right rear leg and front left paw missing. We informed Helen Butler from the Island's Red Squirrel Trust she told us that the squirrel had probably been caught in a trap of some kind. Helen came along to observe Stumpy; she is satisfied he is feeding okay and that he will survive. Helen commented that squirrels can be bullies and will pick on the weak, let us hope Stumpy stands his ground, his disability does not prevent him racing around the trees with the other squirrels.

Just spotted this week, the mandarin drake is back with a mallard lady friend on Claydens Pond. We hope they will stay around and perhaps breed. This is an unusual combination we are told. Our mandarin was first sighted two

years ago with a female mallard in tow heading across the range towards Claydens Pond followed by 12 ducklings.

We are getting over the shock that Clare Backman is leaving the MOD and the post of Editor of Sanctuary. Clare has been very supportive to our Conservation Group here at Newtown and of course her outstanding editorship and devotion to Sanctuary. We wish her well.

Cadets are to be taught the ancient Isle of Wight Sun Dance. This I hope will make up for the wet and windy past year. Smiling faces, the birds singing, Locks Copse full of bluebells and wildlife, what more could we ask for. Oh, the osprey.

Maj (Retd) Dave Maidment
Range Officer and
Training Estate Manager



Bird accommodation copyright © Dave Maidment



Stumpy the red squirrel © Dave Maidment



Kent and East Sussex

DIO Ops Training

South East



Dibgate Quarry © Crown

Cinque Ports Training Area (CPTA), Dibgate Quarry (purchased in 2011) was transformed from a disused and derelict site into a Counter Improvised Explosive Device (IED) training area by 36 Engineer Regiment and 50 Field Squadron. The task was expertly completed within four weeks and resulted in the creation of a 1.5 km track network and a patrol base.

The quarry provided the location for a recording, by Tony Steele, a conservation group member, of a moth new to Britain *Pyrausta aerealis*. Whether the moth arrived on the wing or via the channel tunnel was subject to some speculation.

Future management of the site will ensure a variety of habitats are maintained to provide a small but sustainable specialist training area.

Not all organism identification at CPTA has been positive as unfortunately confirmation of ash die-back *Chalara fraxinea* was received. Areas infected include Sites of Special Scientific Interest (SSSI) designated for their lowland woodland habitat. If ash

Fraxinus excelsior is decimated then it is likely that, through natural regeneration, species with less economic value *Salix spp* and *Populus spp* will dominate which may affect the future viability of coppicing.

The completion of the DIO Ops Training funded brickwork repairs on the inner courtyard of the Dymchurch Redoubt (Hythe Ranges) and refurbishment of the sangars was achieved in the last financial year. Water ingress into the majority of the structure has now been eliminated. The improvements were recently inspected by English Heritage and the curators of the Eastbourne Redoubt (as Dymchurch's 'twin' needs to resolve the same issues that have been remedied at Hythe).

The DIO Ops Training SE (CPTA) conservation groups continue to be well attended and active in the field. Last summer's site visits involved guided tours of Lydd's saline lagoons, Seabrook Stream SSSI and the dormouse habitat at Mereworth. An extensive vascular plant survey of Lydd Ranges was undertaken by group members and other stakeholders.

The detailed nature of the survey was exemplified when the Range Officer questioned why there were people with magnifying glasses on their hands and knees on the HQ lawn. Optical assistance was again needed at the 'newt ponds' when surveyors recorded the country's smallest vascular plant, the 1mm diameter rootless duckweed *Wolffia arrhiza*. Other rare Kent finds included mossy stonecrop *Crassula tillaea* and Bilbao's fleabane *Conyza floribunda (bilbaoana)* with the former last recorded in the county in c1900 having either remained undiscovered for many years or arrived with army vehicles from Dorset or East Anglia.

Bird ringing by Old Park Conservation Group members continues at Canterbury and the training area still holds the UK nightingale *Luscinia megarhynchos* record for longevity (7 years 1 month and 17 days). Future projects put forward by stakeholders at conservation group meetings for MOD involvement include the Sussex Emerald Moth Partnership and the Romney Marsh Farmland Bird Project.

One sad note to report was the death of Eric Philp. Eric was one of the first members of the CPTA Conservation Group and a naturalist and author of great reputation.

Richard Goslett
Land Management Services
Ops Training SE (CPTA)
Defence Infrastructure Organisation



Pyrausta aerealis © Tony Steele



Lincolnshire

Air Weapons Range

Donna Nook



Seal fence; visitors and seals © Peter Roworth

The conservation year at Donna Nook is dominated by the Atlantic grey seal breeding season which starts in October and goes through to the end of December. This year again saw an increase in pup production of 6% to 1,525 with a mortality rate of 5%. The wardening of the site by our partners the Lincolnshire Wildlife Trust (LWT) is invaluable as the National Nature Reserve (NNR) is a popular tourist attraction, with approximately 51,970 visitors during the breeding season, a 25% decrease from the high of 2011. There were visits by several school and university groups, with 1,000 educational visits recorded. Altogether there were 49 volunteers who gave a total of 1,700 hours, 240 days, of their own time to assist and inform the general public and ensure the seals were not unduly disturbed. The main disturbance to the seals is photographers who go onto the outer sandbank. To discourage this practice the wardens arrive before dawn to educate and advise anyone attempting to go out onto the beach.

This tactic has proved effective as the numbers going out onto the beach has decreased dramatically in the last two years from a high of 2,000 in 2011 to fewer than 200 and there was a further reduction in the estimate of pup mortality in the outer colony area. The LWT made a successful bid for Lottery funding and a Project Officer was employed for the duration of the seal season. A new double fence (horse wire netting and chestnut paling on recycled plastic post and rail) was erected to replace the rather derelict double chestnut paling fence, volunteer-training was improved and a volunteer handbook produced.

The NNR is also noted for its stands of sea buckthorn and open dune grassland. Our conservation objectives for these habitats are to decrease the amount of old sea buckthorn to encourage a mosaic of differing age of growth and also by thinning the scrub we increase the area of dune grassland. During February the LWT employed a local contractor, aided by Rural

Elements of the Estate Strategy (REES) monies, to clear scrub from the fore dunes and along the dunes adjacent to the Environment Agency's (EA) sea defence re-alignment site. The realignment site is not on MOD land but adjoins the site on its North West boundary. The new sea bank has been built and the old sea bank will be breached where the river enters the realignment site at the sluice gates to the North East of the site. To the east of this new intertidal habitat there are areas of developing salt marsh and dunes which are on MOD land and are satisfying other conservation objectives for the site.

Squadron Leader L Bourne RAFR
Officer Commanding
Donna Nook Air Weapons Range and
Chairman Donna Nook Range
Conservation Group

Mr Rob Lydstone-Scott
LWT Coastal Warden



Lincolnshire

Air Weapons Range Holbeach



Seal pup rescue © Crown

I have been in the post of Officer Commanding now for over 3½ years and one of the most diverse, challenging but ultimately rewarding roles I have is as Chair of the Holbeach Conservation Group. As such, I wish to pay tribute to this forum that has, over time, played such a large part in the life of the range and wildlife that coexist so well on this lovely, desolate part of The Wash.

According to the Range 540 (Station archives), on 22nd November 1977, Lieutenant Colonel (Retd) C N Clayden (MOD conservation officer), convened a meeting to set up a conservation group 'to study the scientific interest of the Holbeach Danger Area with a view to establishing a permanent group'. There were seven attendees and it resulted in the formation of a conservation group, chaired by the Holbeach Station Commander, with members from Lincolnshire Wildlife Trust, Wildfowl Trust and Dawsmere Wildfowling Group. Nowadays, as well as range staff, membership includes Natural England, local/district councillors, Greater Lincolnshire Nature Partnership, Environment Agency, RSPB, Wash and

North Norfolk Coast European Marine Site, DIO land and environmental officers and, recently, EIFCA. Lincs Wildlife Trust and wildfowling groups have remained constant throughout.

So, since its inception, what issues have been discussed? Rights of Way, byelaws, bird-friendly grass-cutting regimes, samphire-picking, bird surveys, cockling and new fisheries policies, range usage and night-flying, noise complaints, flood defences, the Coastal Access programme, annual bag returns and the seasonal movement of bird populations, Marine Conservation Zones, the maintenance of stoways and borrowpits on the marsh, provision of public information boards, water quality, potential effects of new ammunition/targets on marsh life, ordnance removal, Biodiversity Action Plans, local windfarm applications and wildlife incident reporting, to name but a few.

In the last year, the Integrated Rural Management Plan, a significant piece of work, has been pulled together, and range usage statistics are now presented at each meeting and a new board in the Range Conference Room proudly displays examples of the huge

variety of fauna and flora found within the range boundary itself. And what of the future? As funding is not currently available for further bird surveys, an informal survey programme is being developed using volunteers from range staff. Research has started on the development of a wildlife pond, wet and dry log habitats and the identification of suitable bat habitats.

Marsh inhabitants here are always at the whim of nature. High tides, last year's wet summer and reduced marsh salinity decreased the availability of marine life, in turn reducing the food supply for migrating birds. But regardless, every six months, a committed and enthusiastic group combine experience, good humour and a genuine desire to help, all for the mutual benefit of Holbeach Range and its wildlife.

Lt Col Clayden was on the ball all those years ago when he set up conservation groups right across the Defence estate.

Squadron Leader (Retd) C S Lawrence
Officer Commanding Holbeach Air Weapons Range and Chairman
Holbeach Range Conservation Group



Geese over sea target © Crown



Merseyside Altcar Training Camp



Survey team in action © Mark Adams

In the summer of 2012, Major Bill Hunter, Commandant of Altcar Training Camp, had a previously ignored set of bunkers cleared of debris. It was initially thought that they related to a Post-War air defence system code-named Orange Yeoman. The timing of the discovery coincided perfectly with the Sefton Coast Landscape Partnership Community Archaeology Project 'Soldiers, Sailors and Airmen', so the bunkers were recorded by local amateur archaeologists assisted by Museum of Liverpool's archaeologist Mark Adams.

Orange Yeoman originated in 1949 with a proposal to develop a tactical control radar to feed data to anti-aircraft gun sites. It was intended that the gun sites would be controlled remotely from the Anti-Aircraft Operations Room using radar data provided by two new radar sets. Although the full system never became fully operational the radar went on to be used as part of the Bloodhound missile system.

The survey showed, however, that in fact the bunkers were typical examples of a World War II battery command

post or BCP and three Type 23 Pillboxes. These were designs produced by the Directorate of Fortifications and Works which was set up in May 1940 by Major General GBO Taylor. Its purpose was to provide a number of basic pillbox designs which could be easily constructed by soldiers and local labour.

All four structures were laid out in a regular pattern around a standard WWII Heavy Anti-Aircraft battery with four 3.7" gun emplacements arranged around the BCP. The 1950s MY66 Altcar battery actually lies slightly to the north-east of the WWII site.

The pillboxes are typical examples of the Type 23 Pillbox; the embrasures in the roofed section were for rifles or light machine guns; the open section was for a light anti-aircraft defence and a Bren or Lewis gun would have been mounted on the concrete post. The pillboxes are well preserved examples of a type which is rare nationally and in addition are constructed partly in brick rather than the more common concrete.

The design of BCP appears to have been subject to more local variation than the pillboxes, though the Altcar site fits the general pattern of the 1940s. The function of the hexagonal mounts has not been determined but it is likely that they were settings for items such as range finders which were common features of these structures. The concrete post is likely to have been a mounting for a light machine gun similar to those in the pillboxes.

Despite there being little direct evidence for the BCP and pillboxes at Altcar being directly associated with Orange Yeoman they are a rare survival of Merseyside's WWII air defences.

We would be very interested to hear of similar examples of these bunker designs at other sites to help us learn more about their design and operation. Any information should be sent to commandant@btconnect.com

More on the history and wildlife of Altcar Training Camp can be found in the full colour booklet published in 2011 to celebrate the 150th Anniversary of the ranges. http://www.nwrfca.org.uk/Information/Altcar-Training-Centre-Booklet-2011_V6.pdf

Dr Mark Adams
Senior Archaeological Project Officer
National Museums Liverpool



Type 23 pillbox © Mark Adams



Monmouthshire

Caerwent



A lesser horseshoe bat © Crown

Caerwent Training Area, near Chepstow, Monmouthshire is a former World War II Naval propellant factory now used as an army training area of approximately 1,500 acres and consists of many disused buildings, roads, tracks and tramways surrounded by a security fence. The Caerwent Conservation Group has been in existence for several decades but with the injection of some new and enthusiastic members it has been a very busy year with various new projects and surveys getting underway.

The disused farmhouse at St Malo is an important bat roost for the lesser horseshoe bat but had become overgrown with laurel and a grill over the window opening had broken. Ian Rabjohns, with the help of the Monmouthshire Bat Group organised a project to cut back the laurel to allow a

clear flight path around the building, cut back bramble from the hibernation bunker and fit a new grill to the window. The group carried out a survey of bats over the summer and a total of 450 were counted which represents a very healthy population in Monmouthshire.

The dormice boxes put up a few years ago in the woodland continue to be monitored by Gwent Wildlife Trust but probably because of the poor weather in spring numbers were disappointing. Additional boxes were put up in the autumn in the hope of attracting more of these mammals and a programme of traditional rotational hazel coppicing was carried out; which will improve the military training value of the ancient woodlands but also the habitat for the dormice.

Martin Anthoney surveyed grizzled skipper *Pyrgus malvae* in May and dingy skipper *Erynnis tages* and drab looper *Minoa murinata* in June; and noted a pleasing increase in wood spurge *Euphorbia amygdaloides*, the food plant for drab looper, probably resulting from the coppicing work which allowed more light into the woodland margins. A bonus was the discovery of forester moth *Adscita statice* in mid-June, meaning that despite the cold spring four UK Priority lepidoptera species have been flying in Caerwent.

Stephanie Tyler, Trevor Evans and Elsa Wood carried out a botanical survey over the summer which was excellent as one had not been carried out for a number of years. Amongst their findings were new sites of bee orchid *Ophrys apifera*, common cudweed *Filago vulgaris* and southern marsh orchid *Dactylorhiza praetermissa*. The rare small flowered buttercup *Ranunculus parviflorus* was also found to be doing well; Caerwent is the only site in Monmouthshire known to host this species.

Caerwent as a whole is important to Cadw in the context of its military history with a number of the buildings and tramways recently being designated Scheduled Ancient Monuments. Unfortunately with the passage of time some of these had become scrubbed over but during the year we managed to clear a lot of the vegetation to allow the areas of interest to be seen once more.

Lisa Payne MRICS
Rural Estate Advisor
Defence Infrastructure Organisation



Norfolk

Stanford Training Area



Striated earth star © Alec Bull

What Grows on Stanford Training Area?

Stanford Training Area (STANTA) occupies over 20,000 acres of the Breckland area of South West Norfolk. The soils are mainly acid glacial sands overlaying chalk which reaches the surface at a number of points. Marshy meadows and alder carr border the river Wissey which runs north to south within the western boundary, with an important feeder stream crossing the area from east to west.

The author is a member of the main conservation group with a remit to record both higher and lower plants and fungi throughout STANTA. The higher plants were surveyed on the tetrad basis (blocks of 4x1km squares) between 1990 and 1998, the results were included in the Flora of Norfolk (1999 Beckett, Bull and Stevenson). Additions have been added to the database each year since, whilst the fungi have received increasing attention. During the autumn of 2011 'A Flora of STANTA' (Bull 2011*) was

published privately detailing the habitats and distribution of 712 higher plants and 644 species of fungi with a brief section touching on mosses and liverworts. As the higher plants are fairly unchanging making it relatively easy to pin point what is likely to grow where. Small scabious *Scabiosa columbaria*, larger wild thyme *Thymus pulegioides* and carline thistle *Carlina vulgaris* will be found in varying quantities on the chalky soils whilst heather *Calluna vulgaris* occurs widely on the acid sands.

Recording the fungi requires a different methodology. Some families such as waxcaps *Hygrocybe ssp* and parasols *Macrolepiota ssp* occur mainly on grasslands, but the vast majority of fungi grow in and around trees, from singletons to dense plantations. Thus, fungi have been recorded on a site basis of which, accounts of 49 sites can be found in the book and with the number rounded off at fifty during 2012. Many fungi have a mycorrhizal association with one or more tree species. This is not a parasitic relationship, but one of mutual

benefit to both fungus and tree. Mycelium from the fungus attaches itself to the roots of the tree from which it obtains nutrients and in return, breaks down essential minerals in the soil which are taken up by the tree (Marren 2012). For instance, violet dome-cap *Calocybe ionides*, an uncommon species with several sites on STANTA, only grows with beech on chalky soils. An even rarer species, green-spored dapperling *Melanophyllum eyrei* with a small pale yellow cap and startlingly green gills and spores, not previously recorded from Norfolk, has now been found at four of our 50 sites including site 50, which also accounted for our first and only record of the uncommon *Hygrophorus persoonii* (no English name) This grows with oak. It is not possible to say that, because there are certain species of tree in a wood, such and such a fungus will be found there every year. One of the cup fungi, vinegar cup *Helvella acetabulum* was found for the first time on STANTA in 2012 in an area of mixed woodland that has been searched many times every season for about 30 years and another woodland on chalk produced a first record of the striate earthstar *Geastrum striatum* in 2012. STANTA is a vast area to cover for such a complex study, so something new will be expected to turn up every year for many years to come.

* Copies of 'A Flora of STANTA' are available from the author price £12 including p&p.

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Northumberland

Otterburn



Typical terrain used by goats at Otterburn © Duncan Hutt

The Natural Environment Working Group has been established as part of the Otterburn Conservation Group; members include Defence Infrastructure Organisation (DIO), Landmarc Support Services, Northumberland National Park, Natural England, Northumberland Wildlife Trust and other stakeholders. Ecological surveys and conservation activities are reported to the group and current and ongoing initiatives include bird surveys, a feral goat management plan and enhancement of meadows and mires.

The bird populations of Otterburn Training Area have been regularly surveyed since 2005. Every year Brian

Galloway, a member of the working group and an ornithologist who has been visiting the ranges for many years, has recorded the presence of birds in 26 kilometre squares, approximately 10% of the training area. Surveys have been carried out following the British Trust for Ornithology Breeding Bird Survey method ensuring a standard methodology, allowing comparisons and the identification of trends. His results have shown declines in some species including some ground nesting birds such as black grouse and waders which have been attributed to the poor weather. Wet weather in spring has restricted breeding productivity and cold winters have caused high mortality

over several years, although there was a slight recovery in lapwing, skylark, snipe and curlew in 2012. Other species such as meadow pipit, whinchat and wheatear have remained stable whilst buzzards have increased.

Mammals of the training area have been less studied although there is known to be a thriving otter population and badgers are widespread. A feature of the Cheviot Hills is the small feral goat population, which although effectively living wild, is descended originally from domesticated animals. This year, work carried out by the National Park and funded by DIO is finding more about the goats that live

AROUND THE REGIONS

on the training area and how they relate to other herds in the border area between England and Scotland. The study aims to find out how many goats are currently living on MOD land and whether animals are isolated or interact with goats from other areas such as Kielderhead or the College valley. An output of the project will be a plan estimating the size of the population and any management requirements needed.

Otterburn also has several habitats of international and national importance including upland hay meadows and blanket bogs. Flower-rich meadows are now very rare indeed and there is only a handful on the training area. The scarcity of wildflower meadows is the focus of a campaign launched in March 2013 by the Prince of Wales.

‘Coronation Meadows’ is supported by Plantlife, the Wildlife Trusts and the Rare Breeds Survival Trust. It aims to highlight the best meadows across the country and to promote the creation of new wildflower meadows. The most

species-rich meadows are currently protected through designation as a Special Area of Conservation (SAC) and/or Site of Special Scientific Interest (SSSI). They and others are also managed by tenant farmers under the Higher Level Stewardship scheme at Otterburn but there is more to be done to ensure that the diversity of the meadows does not decline and to enhance other grasslands which could be more species-rich.

Another project is looking at ways to enhance the extensive areas of peat bog. In common with other areas including the North Pennines and the Yorkshire Dales blanket bog is being restored by blocking the artificial drains known as grips which were dug decades ago in an attempt to improve drainage of wet ground in the uplands. These projects are currently at an early stage of development but will have benefits in years to come.

Dr Moira Owen
Ecologist
Defence Infrastructure Organisation



Feral goat © Duncan Hutt



Female whinchat © Andrew Linnett



Pembrokeshire Castlemartin



The marsh fritillary recorded in good numbers at Castlemartin Range © Lynne Houlston

Ups and Downs

The Pembrokeshire Ranges Conservation Group monitors a number of different species but in 2012 they became involved in a project beneficial to a liverwort and the military!

Petalwort *Petalophyllum ralfsii* is a pale green liverwort that grows in damp calcareous dune slacks where an open, short sward of grasses and/or mosses forms a mosaic with compacted bare sandy soil. Petalwort occurs throughout Western Europe but is infrequent and declining due to the threats to the dune slacks where it occurs. In 2002, a very large population of petalwort was recorded at Brownslade Burrows in Castlemartin Range.

Unfortunately, by 2010 surveys showed that habitat succession had occurred and many 'open' areas had now closed over despite the quite intensive military training that takes place here.

Up until 2011, Defence Estates (now Defence Infrastructure Organisation (DIO)) was purchasing sand to fill

sandbags for use on the Range. Discussions between the Countryside Council for Wales (now Natural Resources for Wales), resulted in a detailed plan to extract sand within the SSSI and SAC for the benefit of the petalwort and which the MOD could use for training!

Another species which received additional attention in 2012 was the green winged orchid *Orchis morio*. The Botanical Society of Britain and Ireland launched a Threatened Plant Project with the green winged orchid population at St Govan's on Castlemartin Range being chosen for re-survey by a random selection process. First recorded in 1974, it was estimated that there were 200 plants within a 45m² of winter sheep grazed maritime grassland and heath. This number increased to approximately 2,400 in 1994 and to 7,100 in 2004.

A small section of the green winged orchid population has been fenced each year by the Castlemartin Ranger to prevent the orchids from being trampled. Counts were also carried out and although numbers varied it

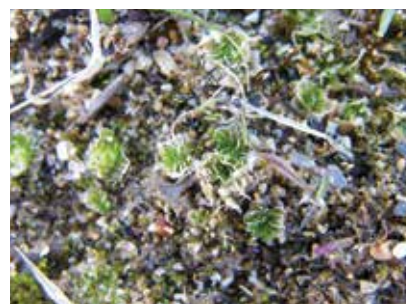
became apparent that the population was moving seawards. This was confirmed in a thorough survey carried out in 2012 across the entire area. It was thought that this could be attributed to a recent run of wet summers combined with reduced livestock grazing due to the intense firing program.

The chough population on Castlemartin Range also receives a huge amount of attention and protection from the large climbing fraternity. Numbers of nesting pairs have recently dropped to their lowest ever with only eight pairs nesting in 2013. This is thought to be due to a mixture of cold and wet weather causing a lack of available food.

The marsh fritillary butterflies have also suffered recently due to the weather but as Castlemartin Range has one of the largest colonies in Wales they will be monitored closely. On a hot, sunny day in June, it was a sight to behold with hundreds of fritillaries fluttering about the grassland!

To end on a positive note, our peregrines returned this year and successfully bred two chicks. With one chick fledged in 2012 this results in three chicks in the last ten years.

Lynne Houlston
Castlemartin Ranger
Pembrokeshire Coast National Park



Petalwort under close management at Brownslade Burrows © Lynne Houlston



Somerset RNAS Merryfield



Rare view of a nightingale in hawthorn © Roger Dickey

The reducing populations of common nightingales *Luscinia megarhynchos* in the UK and in particular the South West is not reflected at RNAS Merryfield in Somerset, where sympathetic management of scrub and wildlife contribute to the most significant densities of these birds in the region. The random clearance of scrub from this part of Somerset, in the pursuit of tidiness or more often the availability of more arable land, is almost always without consideration of conservation concerns and has implications for the more delicate balances in nature. The RNAS Merryfield Conservation Group has resisted this trend and established a careful balance of operational requirements, recreational interests and conservation to the benefit of nightingales. In 2012 they had one of their most successful breeding years and at the time of writing in 2013, are showing evidence of a further increase in the numbers of singing males. However, even within conservation there are conflicts of interest and only regular monitoring and adherence to an agreed site conservation plan ensures that the exclusive requirements of tactical helicopters, brown hairstreak butterflies and nightingales are all met.

The nightingale's song must be the quintessential sound of early summer in southern woods and copses and yet the bird is now Amber listed in the UK. Still common on the Continent, it is becoming harder to find in the west and southwest of England with the majority of birds now in the east and southeast of the country. But as woods and coppiced copses become increasingly sanitised, the nightingale has in recent years favoured dense scrub of bramble and blackthorn which provides additional protection for egg and chick from predation.

At RNAS Merryfield the management of scrub has become increasingly important - too much scrub and the encroachment onto hard standing and training facilities becomes unacceptable in a working environment yet constant trimming opens the understory to predators and leaves the ground-level nests of nightingales exposed. When much of the scrub is blackthorn, there are also implications for the eggs of brown hairstreak butterflies which favour this host plant. A balance has been struck by only cutting back small areas at a time over a period of a couple of years,

providing the added bonus of rejuvenated vegetation growth to the benefit of plant and wildlife.

The airfield has the added interest of two distinct nightingale colonies, each holding up to six pairs of birds plus non-breeding adults, separated by a quarter of a mile of open grass and runway. To ascertain whether there is site fidelity to either of these breeding areas, a colour ringing scheme has been approved by the British Trust for Ornithology (BTO). All nightingales mist-netted and ringed during the course of their short April to July stay in England are given individual colour combinations denoting colony location and year of capture, allowing future monitoring of inter colony movement. Following recent success at DST Leconfield, an inter-service bird-ringing team is spending several days in support of this survey, not only adding to conservation group data but, as significantly, showing nationally how good habitat management has benefited this bird on the westernmost edge of its breeding range.

Lt Col Roger Dickey
Ornithologist
RNAS Conservation Group



Typical scrub habitat for nightingale © Roger Dickey



Suffolk

RAF Lakenheath



Peacekeeper Pond Park © Crown

RAF Lakenheath promotes environmental stewardship and sustainability to its youth population.

Operation Earth Week

RAF Lakenheath, is an operational airbase leased to the United States Air Forces (USAF) and is located 25 miles from Cambridge. It has nearly 5,700 active-duty military members, 2,000 British and US civilians, four schools in addition to supporting three combat-ready squadrons of F-15E Strike Eagle and F-15C Eagle fighter Squadron's and HH-60G Combat Search and Rescue helicopters.

During the week of the 20-24th April 2013, RAF Lakenheath undertook Earth Week expanded on the globally renowned Earth Day celebrated on 22nd April each year. Earth Day originated from a United States Senator,

Gaylord Nelson who in 1970 held the first environmental educational forum within the United States. In 1990, this concept was taken globally by Denis Hayes stressing the importance of protecting the environment.

For RAF Lakenheath, the highlight of the week was the 'pond dipping', introducing our budding young ecologists to the world of flora and fauna and in particular mini aquatic beasts, using the bases own spring fed pond, know affectionately as 'Peacekeepers Park'.

Over five days, Claire Bushnell (Defence Infrastructure Organisation Senior Environmental Advisor for RAF Lakenheath) and Dr Joanne Mortimore (Civil Eng Installation Mgt Environmental Water Programme Manager for the USAF) hosted hourly sessions for children aged between 6-8, culminating in a total of 189 children and 31 teachers and adult volunteers.

The children, under supervision were allowed to dip the pond using nets, which they undertook with gusto!

With the knowledge and expertise of Dr Jo and myself, the mini beasts were transferred from the nets to trays, where the children, using Pond watch bug dials were able to identify what they had caught. The children had great delight poking around in the muddy water trying to catch the mini invertebrates before we gently replaced them back to their habitat. Some of the species caught included pond snails, freshwater mussels, leeches and freshwater shrimps, even smooth newt tadpoles were found, all were carefully located back to the spot were they had been netted.

The event was a huge success and due to this we are currently still undertaking pond dipping with other classes, some of those who are studying aquatic habitats and water quality within their school curriculum, further instilling into the younger generation the importance of environmental stewardship and protection, to ensure that these resources are here for centuries to come. RAF Lakenheath students now know that environmental awareness is important every week of the year and not just for Earth Week!

Claire Bushnell
Senior Environmental Advisor
for RAF Lakenheath
Defence Infrastructure Organisation



Newt tadpole © Iain Perkins



East Sussex Pippingford Park



A newly emerged female brilliant emerald © David Chelmick

The Brilliant Emerald Dragonfly at Pippingford Park

Dragonflies have existed for hundreds of millions of years; they are aquatic carnivorous insects and having a good range of species is a fine indicator of a healthy pond or stream. The British Dragonfly Society regularly holds meetings at Pippingford Park and two years ago in early July, 22 species were recorded in one day; bearing in mind that there are only 30 species recorded from the whole of Sussex, this shows the very diverse set of habitats in the park.

In addition to this overall diversity, there is one particular species that breeds on the lakes, that must be considered as one of the jewels of the Weald. Up until

the early years of the last century, the brilliant emerald was only known in Scotland. However in the early 1900s it was discovered at Crowborough Warren and then at Eridge Park in Sussex. It was then found along the Basingstoke canal in Surrey and in the early 1970s the author discovered this dragonfly at Pippingford Park and we now know that its prime locations in Southern Britain are the lakes of the High Weald.

The brilliant emerald is certainly a beautiful insect, both sexes are a brilliant metallic green which explains its scientific name *Somatochlora metallica*. But this is far from being an easy insect to observe, the males fly very fast only occasionally hovering in sunny corners whilst females only return to water to lay their eggs.

So where do you go if you want to see this elusive insect in Pippingford Park?

The larvae live for at least two years (longer in northern climes) amongst the leaf trash and tree roots around the lakes avoiding the carp which are a feature of the lakes. They emerge on shrubs and vegetation around the water's edge from late June onwards and fly until the end of August. To see the adults you need two things: good sunny weather and patience. Sit close to the edge of one of the lakes; a sunny patch with nearby trees, and if you are lucky, this brilliant green insect will flash past - a male in his search for love. If you are really lucky one may hover in front of you and you can see his brilliant eyes and iridescent green body gleaming in the sun.

To find the females you need even more patience. Any female close to the water will be dragged away by a male to mate. Once mated, the females wait until the sun goes in or until the end of the day when the males go off to feed and then they start to lay their eggs. Find yourself a shady corner and you may see a lone female flying and stabbing her body into a mossy bank depositing her eggs. Don't worry if you don't see this on your first visit. It took me 20 years before I observed this fascinating behaviour.

David Chelmick
Entomologist
Pippingford Park Conservation Group



David surveying for the brilliant emerald © Crown



West Sussex

Thorney Island



Roman cream ware flagon © Ann Davis

Thorney Island is situated on the Hampshire/Sussex border within the Chichester Harbour Area of Outstanding beauty (AONB). It was taken over by the RAF prior to the Second World War and now houses the 12th and 47th Regiment, Royal Artillery. During a visit to St Nicholas, an 11th century church to the east of the island, the author noticed a mahogany, glass-sided display cabinet tucked away in a dark corner, probably dating from the late 40s or early 50s.

The limited records show all items came from Thorney, some of them found by Group Captain Harry Eeles, Station Commander from 1948-50, who it is believed set up the display. Chichester and District Archaeology Society (CDAS) organised the re-evaluation of the collection, subsequently working with the Padre to display the artefacts in new display cabinets.

The bulk of the finds are exceptional by virtue of their quality and/or completeness. The age and type of the pottery tells us a great deal about the Thorney inhabitants of 2,000 years ago, suggesting a Romano British settlement

from the 1st to early 4th century AD, which appears to have been of some status. The occupants had access to imported goods and involved in international trade. They drank wine, ate off imported tableware and enjoyed garum, a fish sauce from Spain.

The exhibits cover:

- Grey Kitchen Ware - most produced 5 miles away at Rowlands Castle or Alice Holt in Surrey, including bowls, cooking pots and storage jars. Two items are almost complete; a bowl and cooking pot. Two large storage containers show internal thumb prints; these are not connected with the manufacturing, but relate to their use.
- Red Table Ware - red glazed 'Samian' pottery was the table ware of choice originating from Gaul (France). In one early piece the potter's mark has been scratched off, possibly by someone not wanting to be seen to use Roman pottery! It wasn't long before British potteries learnt to produce copies; the collection has two pieces from Oxford.



Roman Samian ware cup © Ann Davis



Roman grey ware sherd large urn thumb press
© Mike Dunn

- Drinking - there is a near complete cream flagon, a wine decanter, made at Wiggonholt (near Pulborough). Wine and liquids were transported in amphora (large tall jars). The collection has a nearly complete cream Spanish rim; in this case the amphora probably held garum. There is a half a red 'Samian' drinking cup and pieces of dark, thin-walled beakers from New Forest and Gaul. A piece of fine greyware was produced at Highgate Wood (North London); decorated with dark dots, possibly a cup produced in the shape of a poppy head and used for drinking opiates.

The Society has plans to undertake a programme of fieldwork on Thorney to further investigate areas of Roman occupation.

Ann Davies

Chichester and District Archaeology Society (CDAS)

The project was undertaken by Ann Davies, Mike Dunn and Pauline Norris of CDAS www.cdas.info. James Kenny, Gordon Hayden and David Rudkin, local experts on Roman archaeology and artefacts kindly provided their professional expertise. The Padre, Major Ingham, and his wife provided facilities for the assessment, enthusiastic support and the new display cabinets.



Wiltshire Bulford



Green hairstreak butterfly © Dave Simmonds

In late spring of 2012 the Commander of Tidworth, Bulford and Netheravon Garrison was informed that his Garrison had just about enough water to last for a year. Within weeks the aquifers supplying the camps were almost full, enough, I am told, to keep the Garrison going for five dry years. This short report is drawn from the records of the sub groups during this unusual period.

Despite the wet weather the Botany Sub Group managed a busy programme with no less than 13 meetings. In June, at Silk Hill, the burt tip orchid was found in abundance and frog orchids were seen for the first time on Sidbury Hill in July. This is also where a known patch of yellow birds nest had proliferated to over 100 specimens compared to the dozen or so which had been recorded in the previous year. This plant only grows in a few places in Wiltshire and its abundance greatly impressed the members of Wiltshire Botanical Society, (who were out on the day) who had never seen it in such numbers.

The spring walk to monitor amphibians in the Nine Mile River area was a complete disaster; not even a puddle for them to breed in. However, by the spring 2013 the generous rainfall had filled all of the ponds and produced a substantial flow in the river itself. It was amazing to see how previously dry ponds almost instantly regain their full quota of aquatic flora as soon as the water returns.

The SSSI citation butterfly species Duke of Burgundy was hard to find due to the difficult weather, the adonis blue (also cited) had a very poor year and no silver-spotted skippers were recorded from Warren Hill above the Perham Down ranges, where Wiltshire's only population of this elusive butterfly exists.

On a more positive note several butterfly species prospered by their flight period coinciding with better weeks and by the lush food plant growth for larvae. Green hairstreak numbers recovered significantly, two

purple emperors were seen near Everleigh and large numbers of small heath appeared in May.

The ornithology sub group's members have taken part in a number of BTO Surveys all contributing to ensuring that records of our valuable species are included in national records such as the BTO Bird Atlas, Hampshire Tawny Owl Survey, BTO Nightingale and Whinchat Surveys and the Winter Thrush Survey, which includes fieldfares, redwings and mistle thrushes.

Following a spate of exceptionally good weather in early spring, tawny owls had a very successful breeding season in our boxes. We had 20 pairs producing 41 young. We also had a recovery of a bird originally ringed April 1996 (16yrs old). However, the weather deteriorated as summer drew near, with kestrels occupying nine boxes (more than last year) but only producing 23 young; a poor performance. Our target species, the barn owl, similarly did badly, many sites were vacant and only nine pairs bred producing 15 young, with three pairs only raising one young each.

There were no sightings of little owls and this species appears to now be 'extinct' on the east of the Plain. We did search a number of traditional locations but no long eared owls were found during the breeding season. Strangely, short eared owls were seen regularly in late spring and a number of sporadic sightings in May and June indicate they may have bred.

Lt Col David Barron
Chairman
Bulford Conservation Group



Wiltshire

Imber



An unusual white burnt-tip variety found on Great Cheverell Hill © Nigel Cope

Well, I spoke too soon in last year's edition, extolling the wonderful grassland and profusion of cowslips and butterflies. It was so brief a glorious moment for soon after the weather changed for the worst and seemed to change forever. What a miserable year we have had since, and the Editor expects me to find something encouraging to say! Ever the optimists, the Imber Conservation Group (ICG) has shown a strong start in the first half of 2013 and we are hopeful for the rest of the year. After the depressing start to Spring the last month has finally brought out the flowers in profusion on the Plain with good showings of burnt-tip and butterfly orchids as well as Star of Bethlehem. A few days sunshine and the butterflies have followed with marsh fritillary and Duke of Burgundy on the wing as well as both small blue and the first adonis blues. Enough to cheer anybody up!

The Bat Group has been resurrected and has had a very successful first meeting back in Imber. The potential

out on the Plain is considerable as the former group leader Richard Thompson found, but I am not sure that included a lesser horseshoe on the very first evening. We are now in a position to create a Butterfly Atlas of all the species on the Plain following the last few years of surveying and we have mapped the results of the ad hoc butterfly records going back to the 1960s along with our more recent specific surveying records by grid square. This is being analysed to direct this year's surveying requirements. Particular thanks must be given to Michael Smith (a founder member of the ICG in 1977) for his invaluable support and direction in this project. Other smaller surveys have been undertaken, such as for toads (excellent with all the water lying around) and small mammals (resurrected after some years in abeyance).

The Imber Church Project continues to attract the media with Open Country paying a visit to the Plain at the end of May. The church attracts hundreds of visitors at Christmas and Easter and in

the rare periods when the roads are open. The refurbishment a few years ago by the Church Commission with help from the MOD has been a huge success; the ICG provides support to the project whenever it can.

Andrew Bray encourages his Ornithology Group to do further surveys (there was a very successful hen harrier survey over the Winter) targeting specific birds and has led some 'familiarisation' walks to give new ICG members confidence to get out on the Plain. Nightingales have been heard in the Warminster Danger Area, and there have been records of short-eared owl, corn buntings and whinchats. The Raptor and Owl Group is concerned about the number of birds that have survived the arctic weather of March following the floods of January and February. Overall the breeding season is very late this year. Barn owl numbers seem to be well down as do tawny owl, the females struggling to reach the correct weight to cope with incubation. Kestrels have not fared much better. A new venture by Nigel Lewis and his team is to put some swift nest boxes up on the Tilshead Water Tower and in the FIBUA complex, both ideal sites for the future.

Regrettably Geordie Ward retired this year from making nest boxes of every shape and size. What a star he has been over the years and how important for funding our activities. Good luck Geordie! Unfortunately, space precludes mention of our other groups this year.

Lt Col (Retd) Mike Jelf
and Sub-Group Leaders
Imber Conservation Group



Wiltshire

Larkhill and Westdown



Kestrel chicks © Richard Clayton

We have five thriving sub groups working the central region of Salisbury Plain - the Botanists, Archaeologists, Ornithologists, Owls and Raptors and Deer Managers. During the year we have found a WWI artillery gun (we were looking for a WWII German bomber), refurbished a memorial, ringed over two thousand birds, housed and ringed our owls and kestrels, and managed our deer.

We have a unique nightingale colony at Westdown where you can stand and listen to up to ten birds competing within a 150 metre radius. This year the colony is behaving oddly; very little breeding (poor summer and a cold spring) and males are not settled onto territory, no evidence of any females and certainly no nesting - nests should have been built, eggs laid and young beginning to hatch by the end of May. A bit of a puzzle: hopefully our study will help find the reasons and outcome. For other bird species, willow warbler and grasshopper numbers are up, chiffchaff and lesser whitethroat are down, common whitethroat and blackcap normal.

The archaeologists kept with the birdsong theme and mounted Operation Nightingale, a project to provide recovery and learning opportunities for soldiers returning from Afghanistan. The aim was to locate and excavate the crash site of a WWII German JU-188 bomber known to have

been shot down at the north end of Well Bottom. The site was pinpointed but no wreckage found. However we did find the substantial remains of a First World War 15 Pounder MK1A Ehrhardt Field Gun - a gun instrumental in the development of artillery equipment in the British Army after the Boer War.

The botany group have been investigating dew ponds on the Plain. These were dug in the 19th century to provide year-round sources of water for the vast flocks of sheep kept on the waterless Plain. They are eight feet deep and lined with a mixture of clay, straw and lime, and are refilled by rain water, not dew. A survey is in progress to record the remaining ponds.

In July the botany group tidied up and refurbished the memorial to a German soldier on the Ridgeway near Lavington Vedette. A cross commemorates Jager Dirk Knoffel of 3 Company 313 Fallshirmjager Battalion - a Parachute unit of the German Luftlande Brigade - who was killed in an anti-tank vehicle that rolled over. We traced his old company sergeant major who has passed a photo of the refurbished memorial onto Dirk's parents.

The deer management group's annual census showed a slight decrease in roe deer numbers, possibly due to the long spells of unusually wet weather and this has been taken into account in the planned cull figures for the year.

Finally our owls and raptors - the weather has taken its toll on the whole food chain. Early nesting tawny owls were not early and it is probable that a proportion of barn owls will not reach breeding condition (this is related to the female body weight) due to the lack of their primary food source, field voles. However the recent warmer weather may allow them to lay. The kestrels, too, are running about four weeks late but they are now laying. We

have tried to tempt the barn owls away from the nesting buzzards in areas of grassland where there is little cover but lots of food and have invented an 'owl-box-on-a-pole' to provide a refuge during daylight.

Major (Retd) Brian Nicol
Secretary
Larkhill and Westdown
Conservation Group



Pole Box © Nigel Lewis



German Memorial © Tony Rowlands



Wiltshire

Winterbourne Gunner



View of wild flower meadow from the QMs office © Crown

The Defence CBRN (Chemical, Biological, Radiological and Nuclear) Centre is east of Salisbury just off the A338 is located on a vast swathe of the chalk soils, which cover much of Wiltshire. It is approximately 350ha of chalk grassland, woodland belts, areas of farmed land and buildings. Lowland Calcareous Grasslands is the biological definition of the Defence CBRN Centre estate. Lowland calcareous grasslands are developed on shallow lime-rich soils overlaying limestone rocks, including chalk. These grasslands are now largely found on distinct topographical features such as escarpments or dry valley slopes and sometimes on ancient earthworks in landscapes strongly influenced by underlying limestone geography. More rarely, remnant examples occur on flatter topography such as on Salisbury Plain. This type of habitat has seen a marked decline in the last 100 years and has become very fragmented.

Winterbourne Gunner is located at the South West end of the Porton Down estate, which is a SSSI and has great influence on the Defence CBRN Centre. The chalk grassland is valuable for its diverse flora and most for its associated invertebrates, butterflies and moths,

which are abundant. The area consists of scrubby chalk grassland. The scrub varies from dominant to occasional scattered bushes and consists mainly of hawthorn *Crataegus monogyna* and buckthorn *Rhamnus catharticus*. Bramble *Rubus fruticosus* is also abundant in the scrubby areas. The most species-rich areas are those where the vegetation is kept short by grazing rabbits. These areas contain at least 17 indicator species of unimproved chalk grassland including harebell *Campanula rotundifolia*, common century *Centaurea erythraea* and abundant eyebright *Euphrasia officinalis* agg. Upright broome *Bromus erectus* is abundant in some areas. In other areas, Common bent *Agrostis capillaris*, Yorkshire fog *Hoculus lanatus* and false grass *Agrostis capillaris* dominate. Perforated St John's wort *Hypericum perforatum* is abundant across the site. Anthills are present indicating that the site has been undisturbed in the recent past. There is a small but active conservation group within the Centre who yearly add to the contents of the site dossier. There are permanent on-going surveys - wild flowers (six types of orchid), birds, butterflies and moths, invertebrates, reptiles and mammals. Three years ago the

Regional Prime Contractor produced 100 flat-packed bird boxes of various types, a local school assembled them, numbered each one and presented them to the Centre, there are now 140 nest boxes on the site, and the school is kept informed of the progress of individual boxes.

The woods on the site have not been effectively managed until recent times and are typical chalk-land woods in various states of decay, (would not have them in any other way). Their state of decay is ideal for the resident bird and insect population and fungi. The range staff have worked hard over the years to clear areas of the woods so as to benefit the flora and fauna. Snowdrops have appeared on the site for the first time in recent memory, with hopefully more cleared areas coming into bloom in the spring and early summer. The dead wood that has been cleared is now formed into suitable stacks that have decayed down encouraging insects, beetles, rodents, (hedgehogs love these areas) and snakes to take up residence, also using the stacks for hibernation during the winter.

As alluded to above, over the years the main drive has been to reclaim the training area from invasive scrub and hawthorn. This has been very successful, with favourable comments from DIO Forestry staff, the removal of the scrub has resulted in vast areas of natural wild flowers. With the removal of a number of buildings from the site 'wild flower' meadows have been planted on the building footprint the concept has been very successful. This year 7,000 trees have been planted with a view to the future; next spring these areas will be under-planted with wild flower seeds matched to lowland calcareous grassland.

Major (Retd) Keith Lucas
Quartermaster
Defence CBRN Centre



East Yorkshire DST Leconfield Carrs



Ring-necked duck © Major (Retd) Tim Cowley



Turtle dove © Major (Retd) Tim Cowley

The 2012/13 season at the Defence School of Transport, whilst on the whole a pretty damp and dismal year, started off well enough with Training Area Supervisor Allan Maskell lucky enough to see a roe doe giving birth to a fawn right in front of his vehicle.

A pair of curlew showed interest in the grassland on the training area during the spring as the grass is left to grow on and is taken as silage in late July

allowing ground nesting birds like skylark time for a third brood.

Our usual sparrow hawks were joined by a pair of buzzard displaying and taking up residence on site, with a further single buzzard also seen on numerous occasions.

Young tawny owls were both heard and seen on site, along with the odd glimpse of little owl, and three barn

owls being regularly spotted over the winter months.

On the 17th December we had a nice sighting of a lone waxwing at the top of one of the large trees behind the headquarters building.

Amongst all our usual over wintering ducks on the lakes at Leconfield, we were fortunate to have a drake ring-necked duck from the 20th February through to the 13th March. This North American species is rare in the UK, with this particular bird one of only three in England at the time, with three more sighted in the Scillies and one in Ireland. We also had a couple of goldeneye spotted in February too.

In addition to the ducks, four greater white-fronted geese were spotted on the 9th of February.

In 2012, when the RSPB launched the Op TURTLE DOVE initiative campaign, the DST Conservation Group registered the fact that at least five turtle doves have been observed on DST's training area and birds have definitely been seen to form pairs. As a result of this, on the 9th February 2013, Chris Tomson from the RSPB joined the COS, Lt Col Carol Prosser, Bird Member, Maj (Retd) Tim Cowley, and myself for a four hour walk around the site. Following the visit Chris commented *"This is an important site for a range of important species - turtle dove in particular and the RSPB is pleased to offer expertise and support in an ongoing capacity."*

Alan Bakewell MCMI
DST Leconfield Carrs



North Yorkshire

Catterick



Wetlands and hide at Foxglove Covert © Crown

Conservation activities on Catterick Training Area have, like many sites, been influenced by the weather. The agricultural tenants describe the last 12 months as one long wet and damp winter. Major (Retd) Tim Helps, our Lepidoptera specialist, said that the recording butterflies and moths in spring 2013 had been an unrewarding experience. Against this backdrop a considerable amount of conservation work has been achieved.

Downholme Permissive Footpath Project

The 5.8km permissive footpath between Downholme and Hudswell links up existing rights of way in Swaledale and showcases many MOD conservation projects such as native

woodland establishment, black grouse regeneration works, moorland restoration and SSSI management. Working in partnership with the National Trust, Yorkshire Dales National Park and the Swaledale Outdoor Club an interpretation leaflet has been produced to satisfy an ever increasing public demand to walk this spectacular route, which now forms part of the long distance Swale Way footpath.

Ornithology

Activity has been co-ordinated by Major Tony Crease chairman of the Conservation Group. Barn owls and tawny owls have suffered due to the poor weather conditions; two underweight barn owls were recovered and sent onto a bird sanctuary for rest

and recuperation and were returned once their condition had improved. Bird ringing activities continue as part of the Constant Effort Site in Foxglove Covert Local Nature Reserve; of special note a 16 year old jay has been caught which was originally ringed in 1997. This was just a few months off the British record.

Foxglove Covert Local Nature Reserve

Foxglove Covert Local Nature Reserve continues to thrive attracting more species and visitors than ever before. School projects have taken place throughout most of the summer and over half a million people have now enjoyed the facilities the reserve has to offer. More than 10,000 hours of volunteer time is contributed annually



Garrison cookhouse and dining rooms constructed in 1915 © Henry Boot photo archive

from members of the local civilian, military and ex-military community. The award-winning website has had more than a million 'hits' and 1,500 community groups have visited in the past two years alone. Over 50,000 new birds have been ringed on the site and 93,000 have been processed which is remarkable. The most recent success has been the Bioblitz weekend held in

July which attracted hundreds of visitors during the two days and involved species recording over 20 natural history disciplines. Many varied walks and activities were conducted which were popular with the public; these included moth trapping, bird ringing, lichen and fern identification and rural crafts such as coracle making and pottery.

Woodland Development Project

The Catterick Training Area development plan has highlighted the need for additional woodlands; principally these were required to support military training needs and to provide a sustainable woodland resource. Working with tenant farmers, 100ha of new mixed woodland planting is planned to go ahead in 2013 and 2014. This project has been made possible by the tenant farmers and DIO staff working closely together to submit an application for Woodland Grant Scheme funding. These new woodland blocks will enhance the conservation

value of the training area; provide habitats for a range of species at the same time will provide a sustainable training facility for decades to come.

From Farms to Arms

The conservation group project to produce a History of Catterick Training Area book is nearing completion and the document provisionally named "From Farms to Arms" runs to over 200 pages. Many hours of work have been undertaken by Nancy Tanner, the specialist researcher, and Phil Abramson DIO Archaeologist; which involved interviewing, collecting photographs, researching archives and collating. The book will be published on completion of the final edit and all members of the conservation group can be justifiably proud of this achievement.

Graham Newcombe
Senior Estate Surveyor
Defence Infrastructure Organisation

Major (Retd) Tony Crease
Chairman Conservation Group



North Yorkshire Ripon Parks



Redwing feeding on berries © Dr Chris Lewis

Ripon Parks, a military training area covering approximately 274ha (678 acres) which borders the River Ure and is predominantly a SSSI that includes large areas of open grassland, oak and birch woodland (Fox Covert wood contains some stunning mature oaks), several lakes/ponds (some containing a rich, aquatic flora and fauna), fenland and hawthorn copses. The greater part of the training area is farmed under tenancy agreements, being grazed by sheep and cattle, some under environmental stewardship.

For over 40 years local ornithologists have visited the area, during which time several species have become locally extinct, such as stonechat and whinchat. Since 2002, the East Dales Ringing Group have carried out bird

ringing studies (using mist nets) in the various habitats which make up the mosaic that is Ripon Parks.

In the earlier years, Fox Covert wood was one of the core sites used on the annual Catterick Ringing Course, organised by Major (Retd) Tony Crease. Some 635 birds of 27 species (including seven species of warblers) were ringed during the three year period the site was in use. Since 2010, bird ringing activities have centred on three areas - Round Hill (open hawthorn woodland), the Dubb (seasonally flooded pond with scattered willows) and Green Lane Ponds (three ponds bordered by tall, hawthorn hedgerows and a game crop). These sites have their own unique attractions to different species of bird and several species of warblers breed in the general area. The Dubb has proved very attractive to passage willow warblers, 70 being ringed here during autumn 2012 (two or three pairs also breed on site).

A mature hawthorn copse is a favourite feeding site for the Scandinavian thrushes which migrate to the UK in late autumn in search of food (berries) - based on a Swedish design, a double-height elevator net was installed here in autumn 2012 and proved highly successful at catching

the birds in the treetops - 80 redwings, 4 fieldfares and 10 blackbirds were ringed between mid October and early November. This period was also notable for unusually high numbers of lesser redpolls migrating through the country and the team took full advantage - managing to ring 145, one of which was subsequently re-caught, as it continued its journey, in South Yorkshire. Prior to that, only 32 had ever been ringed on the Parks!

During winter 2011/12, a large, mixed flock of finches and buntings was located, feeding in a game cover crop (and spilt grain from pheasant feeders), the birds roosting in an adjacent blackthorn/hawthorn thicket near Green Lane Ponds. Carefully positioned mist nets enabled the ringers to catch 58 yellowhammers, 54 reed buntings and most tricky of all to catch, two corn buntings. One reed bunting was already ringed and after submitting the record to the British Trust for Ornithology we were informed it had travelled some 91km from Lancashire to spend the winter across the Pennines in the Ripon Parks area.

Apart from one random visit back in 1983, no dedicated moth trapping had been carried out at Fox Covert wood until Dr. Charlie Fletcher, Jill Warwick

and Steve Worwood started recording there in 2002. Since then, equipped with generators and Mercury Vapour light traps, some 24 visits have been made to this interesting wood, with its wonderful ancient oak trees, open grassland areas and regenerated marsh. To date, 386 species have now been recorded, several of which are local rarities, including *Epermenia falciformis*, *Olethreutes micana*, *Pammene rhediella*, dark umber, round-winged muslin, plain clay and white marked. Another species, the lesser cream wave, has been recorded fewer than 30 times for the whole of Yorkshire, many of the records dating from the 19th century. The three found flying during the day over the wet grassland area east of Fox Covert wood by Dr. Fletcher in July 2004 were the first for this part of Yorkshire!

In addition to the moth recording, the bird ringers record and count any butterflies seen during their visits which has resulted in a site list of 20 species, including the locally rare white-letter hairstreak and gatekeeper.

Jill Warwick
The Dales Ringing Group and
Ripon Conservation Group



Corn bunting majestically singing © Dr Chris Lewis



Cyprus

Sovereign Base Areas

Year of environmental achievements for the Sovereign Base Areas Administration in Cyprus

The funding for the construction of the permanent Akrotiri Environment Education and Information Centre was approved last year and the ceremony for the new centre took place in March 2013; with a wide attendance including the Commander British Forces, members of the Akrotiri Community, representatives from the Republic of Cyprus and non-governmental organisations. Construction is expected to be completed by 2014 and will be a landmark in the Akrotiri community. The Akrotiri Peninsula, with its wetlands and surrounding mosaic of habitats, is a hotspot of biodiversity for flora and fauna and the new centre will contribute to the conservation and sustainable promotion of this unique site which has huge environmental value, not just for the Sovereign Base Areas but for Cyprus as a whole. The centre, which has been operating from rented accommodation, has been part of the Cyprus network of Environmental Education Centres since 2008 and has offered environmental programs to more than 35,000 school children and more than 1,000 teachers and students. The aspiration now is to extend its daily programmes to multi-day ones, with accommodation at the village, creating more income and interest for the local community. Also to expand its activities with eco-tourism initiatives which will have important financial benefits for the community; as well as raising awareness on the cultural and historic importance of the area; such as the promotion of basketry and other traditional crafts?

In cooperation with the Akrotiri Community Council and the Akrotiri Primary School several events were organised to celebrate World Wetlands



Basketry workshop, World Wetlands Day celebrations © Thomas Hadjikyriakou



Ground-breaking ceremony, Akrotiri Environmental Education and Information Centre © Samantha Wylie

Day 2013 on 2nd February. Local residents and visitors learned about the importance of the wetlands and did some bird-watching. Plants were collected from the wetlands (reedmace, rushes and sedges) and used for a basket weaving workshop, introducing

children to the traditional craft and with guidance from local basket-makers and personnel from the centre children created their own small straw baskets and trays. These together with photographs of the wetlands taken by school children, were presented at an



Bird watching event, World Wetlands Day celebrations © Thomas Hadjikyriakou

exhibition as part of the celebrations. The children also organised and presented a theatrical play with songs and poems on the wetlands.

The Akrotiri Peninsula Environmental Management Plan which covers the Special Protection Areas for Birds, candidate Special Areas of Conservation for habitats, flora and fauna species and the Ramsar sites was completed in 2012 and the SBAA Environment Department gave a presentation covering the ecological, cultural and historic significance to members of the communities concerned, NGOs, and

Republic of Cyprus government departments. Everyone was very positive on the recommendations of the Environmental Management Plan to development eco-tourism that will co-exist with nature protection and at the same time generate significant financial gains for the local communities. The next steps include the discussions of the proposed actions with each community separately and the adoption and implementation of the recommended actions.

The SBAA Environment team continues to work on other issues such as turtle

conservation, monitoring Griffon vultures and other bird species and co-ordination of archaeological excavations. The Republic of Cyprus Antiquities Department has, since 2007, been excavating what appears to be an important Christian monument dating back to the 6th century which was destroyed by an earthquake in the 7th century.. The excavation has unveiled floors with well preserved mosaics, bronze coins and marble and glass fragments. The wider archaeological site appears to be of great significance and it is estimated that it covers an area of 240,000m³.

The next big project is all the work associated with the designation of the Special Areas of Conservation; this includes confirmation of all the qualifying candidate sites and a wide stakeholder consultation with the objective to formally designate the areas by the middle of 2014.

Alexia Perdiou
Environment Department
Sovereign Base Areas Administration



Gibraltar

British Forces Gibraltar



Buffadero' rich wild flowers © Cpl Crowe

DIO and British Forces Gibraltar are pleased to announce the establishment of the BF Gibraltar Conservation Group. This was done at the official signing of

the IRMP by Commander British Forces Commodore John Clink and Minister for Environment Dr John Cortes. Cdr Clink welcomed the group and re-affirmed his commitment to the IRMP from both himself and his command: *"This is a unique part of Gibraltar and as part of our overall sustainable strategy we have worked in collaboration with the Government of Gibraltar and all conservation societies to ensure the IRMP is an effective tool which will help us deliver MOD policy."*

As part of the Conservation Group future decisions for the site are made in full consultation with the Governmental Department for the Environment and NGOs. Nicolas Andrews-Gauvain, DIO Environmental Advisor gave a presentation highlighting the benefits

of joint working and communication: *"Military training and conservation can go hand in hand, Salisbury Plain is a good example of how a designated site can be managed while still providing an excellent military training facility."* Dr Keith Bensusan, Head of the Strait of Gibraltar Bird Observatory: *"This is music to my*



The official signing of the IRMP © Cpl Crowe

ears and a lot of goodwill has gone into this. It is an important area for wildlife and biology and essential for the migration of birds. The IRMP goes a long way to addressing continuing conservation issues and it has provided a road map for the management of the site." Dr Keith Farrell, Chairman of the Gibraltar Heritage Trust was also present at the launch and said "We are really formalising what has been

happening on a small level already but now we have all key players on board." Minister Cortes' absolute passion for the environment was evident following the official signing when he said: "This is an emotional moment for me, in the 60's I used to come up here and log the birds and have enjoyed the wildlife here for years. This is even more significant and important to me now because the people of Gibraltar have entrusted the

environment to me, I have sincerely noticed a difference here, Gibraltar needs this, we have a European and International responsibility for the environment and this will provide long term sustainability with a lasting impact."

Nicolas Andrews-Gauvain
Overseas Environmental Advisor
Defence Infrastructure Organisation



Falklands

British Forces South Atlantic Islands



BFSAI Conservation Group team after a morning litter picking in Mare Harbour, Falklands © Roy Smith

It's been a pretty standard year down here with the penguins! Our monthly evening meetings have embraced subjects as diverse as comparisons between the North and South Poles, rotational farming, oil exploration around the Falklands, raptors - the myths (good and bad press), conserving and control of Falklands fish stock, MOD ranges and of course penguins. All talks have had an environmental and conservation slant and all, of course, have been very interesting.

Our group activities have included several beach cleans - the latest involved the collection of drift wood and a bonfire on the beach with marsh mellows - who says you can't mix

business with pleasure? We have joined with Falklands Conservation to help dig and replant blue and tussac grass into areas damaged by environmental conditions or fire. We also spent a whole Sunday on our knees removing as much calafate from Port Sussex farm as we could. Calafate, commonly named Magellan barberry *Berberis microphylla* or *Berberis buxifolia*, is a South American invasive evergreen shrub species with shiny box-like leaves. sixteen of the group managed to clear 70m x 70m of a 7km² area. More work required, I think!

We have identified an elephant seal with Seal Pox and notified the authorities, helped Madrid University undertake a study into the relationships

between wild and domestic fowl - I will not go into where you have to stick a cotton bud for that!! We have been active in helping control invasive plants on MOD property too, with ragwort, thistle and greater plantain *Plantago major* coming under the spotlight.

Our membership is a mix between continuity post, family members, contractors and personnel on short term (4 to 6 month) postings. Opportunity is taken in the summer months to get out and enjoy the incredible wildlife and the Falklands scenery and in the winter, to undertake as many conservation tasks as we can. The group has around 100 members.

Roy Smith
Theatre Health, Safety & Environmental Protection Officer



Sgt Graham Laurensen and Roy Smith, helping Falklands Conservation remediate eroded land by planting tussac at Cape Pembroke, near Stanley © Crown

Defence Infrastructure Organisation

DIO manages the MOD's property infrastructure and ensures strategic management of the Defence estate as a whole, optimising investment and providing the best support possible to the military.

Secretariat maintains the long-term strategy for the estate and develops policy on estate management issues. It is the policy lead for sustainable estate.

Operational Development and Coherence

The ODC Infrastructure Professional Services (IPS) team provides professional support to the MOD. IPS acts as a focal point for all environmental needs and enquiries across the estate providing a dedicated team of professional experts in a variety of environmental disciplines.

DIO Infrastructure Professional Services

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IPS Scottish Environmental Liaison Team

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ODC Utilities Team

The ODC Utilities team is responsible for Energy Management, Energy Delivery and Payment, along with Water and Waste Policy Implementation across the MOD estate both UK and overseas.

Energy Management Team

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Energy Delivery and Payment Team

Tel: 0121 311 2457

Water and Waste Policy Implementation

Tel: 0121 311 2144

Strategic Asset Management and Programming Team

SAPT acts as the strategic infrastructure planners and policy makers for Defence, taking a Defence-wide perspective on the estate's assets.

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Environmental Compliance Policy

including waste management, land contamination, energy, and environmental protection.

Tel: 0121 311 3693



**Defence
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Fern frond with spores © Iain Perkins

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Submissions

If you would like to contribute to Sanctuary Magazine or enter future Sanctuary Awards please contact Iain Perkins, Editor at: DIO-Sanctuary@mod.uk



View across to the strip lynchets on Scratchbury hill from Battlesbury hillfort © Mike Jelf



Ministry
of Defence