Wales Biodiversity Partnership Conference

'Natural Resource Management and Nature Recovery in Wales' Aberystwyth 9-10 September 2015

Day 1

Session Chair: Chris Lea Welsh Government

Context

This is an exciting time of change in Wales with the Well Being of Future Generation Act and the forthcoming Environment Bill showing that Wales is leading the way in legislation. Challenge: how do we build resilient ecosystems and deliver Natural Resource Management? The conference is an opportunity to reflect on this, with the Minister and a good range of speakers drawn from across the sector and complemented by workshop sessions. This is a time to remember and reflect what biodiversity can do and how it impacts on Wales and the wider world. Biodiversity has a key role the play in society including the fight against climate change; employment and growth; clean water and healthy soils; tourism and education. Children will follow through environmental good practice if engaged in early learning. This is a time to be innovative, building on what being achieved so far through use of creative funding and delivery models such as Payments for Ecosystem Services. Developments including pine marten reintroduction and the future declining use and availability of pesticides through the uptake of bio-pesticides- these will have implication for our biodiversity and ecosystems and we need to engage and focus on this. The EU INNS Regulation presents challenges around which species to welcome and which do to eradicate. We need to focus on nature recovery and recognise success for example the Osprey Project and draw in the public. There will be financial challenges in delivery and drawing in the public, private and voluntary sectors will be key, in particular the private sector where greater engagement is required to achieve our ambition.

Wales' Natural Resources: Resilience of Ecosystems and Biodiversity – Professor Jack Cosby, Centre for Ecology & Hydrology

Ecosystems are complex systems. Biodiversity underpins our ecosystems. The more biodiversity we have, the more resilient our ecosystems will become. Resilience is one of the many expressions of stability concepts in ecology. One study indicated that Resilience is a measure of the overall stability of the system (6 measures in total). In the context of natural resources, ecosystems need to be able to recover their function so society receive the benefits when ecosystems are exposed to long term pressures e.g. global warming and short term pressures e.g. pests and diseases. Ecosystem Services can be delivered at high rates but with the underlying Natural Capital being eroded i.e. we are not using them sustainably. People and natural resources are highly connected. The Glastir Monitoring

and evaluation programme (GMEP) is attempting to capture this complexity and interdependence. GMEP monitoring can help deliver metrics in 4 key areas: condition, extent, diversity and connectivity. Future challenges: measures of resilience are a contested area and connectivity can be undesirable in the event of a disease outbreak and the setting of ecosystem targets will be challenging. Actions to improve the health of our ecosystems, monitoring an adoption of new technologies are areas that will bring benefits to ecosystems.

Presentation link

The "Conserving the Park" scheme – working with farmers and landowners to optimise biodiversity on their land- Geraint Jones Pembrokeshire Coast National Park Authority

The presentation highlighted grazing initiatives in the Pembrokeshire Coast National Park. UK's only predominantly lowland, coastal National Park different than other National Parks and forges a strong relationship between the NPA and the farming community. About one third of the NPA is covered by semi-natural habitats (often fragmented) and the management can be influenced by the Park Authority. Over the past 16 years PCNPA has developed a series of schemes to assist farmers and landowners to make the most of the biodiversity on their land. The two key elements of the approach are simplicity and flexibility and longevity. The Local Biodiversity Action Plan provides the context for the work. Increasing connectivity has been a priority e.g. targeting the connectivity of Marsh fritillary butterfly sites. Other projects include the southern damselfly work with commoners in the Preseli Hills and the SAC site work with NRW. Practical help is given to farmers' vegetation management including bramble clearance, bracken bruising and gorse burning and creation of fire breaks. For example, the Pembrokeshire Wildfire Group – provided practical assistance to farmers and landowners to burn vegetation safely and in accordance with the Heather and Grass Burning Regulations (Wales) 2008. A 33% decrease in wildfire incidents in Pembrokeshire has occurred since the inception of the group.

Presentation link

NRWs approach to embedding NRM – from legislation to practical delivery – Dr Sarah Williams, Natural Resources Wales

Natural resource Management- delivered by adaptive management and the principles of the ecosystem approach. Purpose of NRW as laid out in the Environment Bill but Welsh Government and environmental NGO's will be important in its delivery. Long-term thinking; Consider the benefits of ecosystems and consideration of resilience of ecosystems. Area Statement will be published 2017/2018 and will reflect local needs and priorities. National Natural Resource Policy will translate national targets into local action. State of National Natural Resources report (SoNNaR) translate national data into national strategy and need to be 'owned; by partnerships working in close

collaboration will be out in autumn 2016. SoNNaR will evolve over time to cover social and economic elements; there will be 'gaps' in the beginning.

Area trials were chosen to represent different aspects and challenges- the Dyfi is farming; Rhonnda is community based; and the Tawe is a mixed environment with elements of farming and industry. Iterative process, evidence gathering and engagement will be important. Pilots can be scaled up across Wales. Experimental powers (power to suspend statutory requirements and for NRW to conduct experiment schemes) - NRW will be looking to have these in the Environment Bill but used only under the guiding principles of sustainable management and the areas under NRW's control. They would require Ministerial and scrutiny panel approval before use.

Presentation link

Nature Recovery at the local level and the ecosystem service approach– Dr Geoff Hobbs, Bridgend County Borough Council

The Bridgend LBAP based on ecosystem mapping and landscape character assessment. Partner involvement and funding to take the LBAP forward will be key. Linking in with planning and the future Public Service Boards aligned with the core LA activities will be required. Action for lapwing and great created newt are examples of projects that could be delivered using the new approach. The evidence presented in the updated LBAP and accompanying technical report has been used by partner organisations in developing funding bids.

Presentation link

Soapbox session: Time for some plain talking- Rachel Sharp, Chief Executive, Wildlife Trusts Wales

We need to get behind the Environment Bill. Lines of accountability and targets have the potential to enhance the Bill. We need to shout about the environment in the run up to the Assembly elections. The restoration of peatlands in Wales and contact with nature through preventive health care are examples of achievable actions. We need to challenge each other, be bolder and bring in external pressure to act by engaging with the general public and wider government.

Talk only - no presentation

Panel discussion and open floor discussion

Chris Lea (CL) Deputy Director of Land, Nature and Forestry Division, Welsh Government (Chair)

Panel

Professor Jack Cosby (JC) Centre for Ecology and Hydrology

Geraint Jones (GJ) Pembrokeshire Coast National Park Authority

Dr Sarah Williams (SW) Natural Resources Wales

Dr Geoff Hobbs (JH) Bridgend County Borough Council

Rachel Sharp (RS) Chief Executive, Wildlife Trusts Wales

Becky Davies (BD) Natural Resources Wales project lead, Rhondda

Question 1 (Roy Tapping, Cofnod). Targets can be used to drive change. Why are there no targets in the Environment Bill?

RS: Agreed, but we can be fixated on targets, which are a means, not an end. We need to be outcome focussed. There was a suggestion of 5 year milestones, but these are not popular with politicians.

SW: There are lots of targets in EU legislation and these will not change, e.g. for Habitats Directive, SSSIs etc. There can be a tendency to focus on targets, not on wider ecosystems. Indicators are important, but we need all-inclusive indicators.

CL: A balance is needed with EU targets

Question 2 (Patrick Green, NRW): Why are we so poor at accessing money for nature?

RS: We need to ask! But we don't talk the right language, and need new expertise to help with this. We save money, but we don't generate income. Traditional funding is drying up, and we need to become more creative. Also, the market needs to be incentivised to work for nature. New expertise is needed to help with this.

BD: In the Rhondda, doctors are now referring elderly people to get time in the natural world as an alternative to conventional treatment. The Sports Council and local health authority also recognise therapeutic value of nature. Rhondda has a great open access resource.

GJ: This is a legacy from the past, when an interest in nature was seen as eccentric. We need to learn to engage with people other than ourselves.

Question 3 (Steve Bolchover, Volunteer Swansea and Neath Port Talbot Biodiversity Partnership): We need to engage with people at an appropriate level. Why has NRW decided to organise itself on river basins, which are arbitrary and do not coincide with boundaries that people use?

SW: Our evidence is based on river quality, so a river catchment approach is appropriate. NRW will have to engage with others at an appropriate scale. Evidence with have to be used in a flexible way, and will not necessarily be presented at a catchment level.

Ruth Jenkins (NRW from audience): No decision has been made on this. The area statement process is flexible. This is a new approach and NRW is not pretending to know all the answers. We need a human scale, and will work with local knowledge.

CL: There are still shortcomings in expertise, particularly in the study of soils. Need to engage with academia.

GJ: Local government cutbacks are unprecedented. Need to work in a new political framework

GH: River basins make sense on an ecosystem level.

Question 4 (Mike Webb, RSPB Cymru): Environment Bill has elegant structure, but no evidence on how it will affect other bills e.g. planning and other consenting systems e.g. planning, forestry and agriculture. There needs to be a clear statement of 'materiality'. What will the weight of the bill be? The only measure of success will be how Wales views unsustainable activities such as open cast, fracking and the M4 relief road.

SW: It is very important that the Environment Bill shapes the planning process. Need to ensure 'Sonar' is consulted in the planning process. We need development, but in the right place.

BD: Our core stakeholders the local authorities. Area statements should influence local plans.

RS: Nature conservation always loses in the need for balance. We need a nature recovery plan as a principle.

Adam Rowe (SEWBREC): We need to make the best use of existing evidence. There is lots of information, but it is not used properly. We need to be able to manage data. 'Sonar' must use the best information. Resources must be put into information management.

CL: There will be a new evidence board for natural resource management. We need to use data and join up with others, using new approaches e.g. citizen science, drones etc.

RS: Money is needed for this. We need to get LRCs into the process.

Deb Hill (ecologist, City and County of Swansea): Whilst welcoming the Environment Bill, how do Area Statements fit in? Who is accountable? Who decides governance?

Russell De'ath (from audience): The Environment Bill is not prescriptive. It depends on the issue concerned. Flexibility is needed at a national level, but different issues require different approaches and scales. Are statements should be local operational plans.

CL: Also important to involve private sector.

Panel discussion Day 1

Soapbox session- Mid Wales Red Squirrel Project, Becky Hulme, Mid Wales Red Squirrel Officer, Wildlife Trust of South and West Wales

3.5M grey squirrels in UK now… out compete red squirrels for food resource and vector of disease (pox virus) which kills red squirrels. Red squirrel populations on Anglesey, North East Wales and mid Wales.

Mid Wales Red Squirrel Project uses a Reserve + Buffer zone approach.

So far, the project has engaged 80 volunteers to help with various activities:

- trapping of grey squirrels,
- reporting sightings (internet facility)
- monitoring camera traps

Presentation link

Soapbox session- Grassland management should use leafhoppers and planthoppers as a measure of change, Mike Wilson, National Museum of Wales

The reason for using leafhoppers and plant hoppers as a measure of change is due to their host-specific nature making them good taxonomists. There are 400 identified species in the UK and around 250 species are associated with grasslands/bogs/fens. They are often the most abundant insects in grasslands making qualitative sampling with a vacuum sampler an easy task. Another benefit is that they are fairly taxonomically stable and there is extensive literature on the effects of management regimes.

Guide books: e.g. The Leafhoppers and Planthoppers of Germany; The Planthoppers and leafhoppers of Britain and Ireland (Bring together taxonomy and valuable information on the taxon).

Presentation link

LIFE Natura 2000 Programme –securing a future for Natura 2000 sites in Wales - Kathryn Hewitt, Natural Resources Wales

The Natura 2000 network of sites in Wales consists of 92 Special Areas of Conservation (SACs) and 20 Special Protected Areas (SPAs) harbouring 54 Annex I Habitats and 28 Annex II species as well as 41 SPA birds. The LIFE N2K Programme is a strategic programme of action for the management and restoration of all SACs and SPAs in Wales, and their habitats and species for the period 2015-20. The big issues identified by the programme are:

- Grazing and livestock farming
- Invasive species, disease & pathogens
- Air pollution
- Access and recreation management
- Man-made changes to hydraulic conditions
- Habitat fragmentation
- Diffuse water pollution
- Woodland management
- Marine fisheries
- Climate change
- Flood and coastal erosion management
- Marine litter

Elements of the programme:

- Prioritised Improvement Plans - site action plans
- NRW Actions Database
- Thematic Action Plans addressing major issues/risks (see above)
- Cross-cutting Action Plans
- Prioritised Action Framework

A total cost of around £144 million (~£1.3 million per site) was estimated to deliver/carry out the identified actions across all N2K sites.

The prioritisation of N2K actions was done via a tool-based approach which are usable at different scales and for different users. Tool 1 is a prioritisation matrix for sites to prioritise issues/risks against features. The second tool was multi-criteria decision analysis for conservation needs and

drivers which identified which features and ecosystems have the greatest conservation needs. This process identified the following ecosystems as the ones of greatest need:

- Peatlands – lowland and upland
- Sand dunes
- Rivers
- Woodlands
- Lagoons and associated vegetated shingle
- Estuaries and saltmarsh

There are some major messages coming out or the programme:

A high number of investigation actions indicate that there is still a lot unknown about N2K feature condition and the effect of activities on the sites with a particular lack of data for marine habitats and species features.

Presentation link

LIFE Natura 2000 presentation

Berwyn, Migneint, Radnor and Black Mountains Upland Recovery Project - landscape-scale species recovery & wider ecosystem service delivery- Will Duff Gordon BMRBM Upland Recovery Project

Nature Fund project. Brought together by CLA, working with GWCT (Game and Wildlife Conservation Trust) and FWAG (Farming and Wildlife advisory Group)

Not a particular organisation, but 60,000 acres represented by landowners and farmers

ISSUE: Chronic declines in bird species e.g. red grouse, Welsh uplands deteriorating faster than England & Scotland

AIM: Landcsape-scale species recovery: peat protection, water erosion works, heather management, predator control

PROJECT WORK: Spread £241,000 over 9 projects: max catalyst effect, different sets of challenges and conversations to shape future policy, skills sharing between projects, linking areas

Wildlife Wardens responsible for actively managing upland habitats:

- Heather, bracken and gorse management
- Education and training for upland owners and users
- Revival of upland sporting activity

Final investment over 7 months = c.500k Glastir Advanced (capital works + targeted grazing) and Nature Fund + Private Investment

Manpower employed = 14 new jobs (2 trainees)

Total attendance at community events= 300

Pest control a key issue in the Welsh Uplands 2230 crows removed, 256 foxes removed during the course of the project

Presentation link

Day 2 10th September

Session Chair: Madeleine Havard, Natural Resources Wales Board Member

Citizen Science keynote address- The role and potential of citizen science, Dr John Tweddle, Natural History Museum London

Citizen science is a great tool for connecting people with nature. It is able to tackle 'big questions' by making it local. Examples include tracking the spread of invasives; measuring & mapping pollution (air, noise, water). Examples from NHM include the orchid project 'Orchid Observers'. Citizen science represents another tool in the armoury and is not a replacement of existing tools and it need to be recognised that it is not always the most appropriate technique to employ. It is not free (requires resourcing) and you get out what you put in. It opens up science to a broader audience and is a precursor to behavioural change. Citizen science confers indirect benefits and is one stop removed from actions benefiting species and habitats. For example the Riverfly Partnership network has linked anglers with the Environment Agency, improved communications and capacity between volunteers (citizen scientists) whilst contributing valuable information which can be used to benefit nature.

Concluding thoughts on citizen science in the UK:

• Increasingly being recognised as an opportunity to have meaningful dialogue, engagement and collaboration between Science, Society and Policy.

• Flexible concept that can be applied to many topics and situations

• Proving to form a useful piece of the biodiversity and conservation puzzle

• But it isn't a replacement for existing activities

• Nor is it guaranteed to succeed – it requires funding and deliberate design

• Just like other aspects of science, it has limitations and biases

• Combination of hands-on involvement and interaction with 'experts' can positively impact attitude towards science and nature…critical for future of biodiversity.

Challenges/next steps for Citizen Science

1. Evaluating and understanding the social and educational impacts and outcomes

2. Coordinated approaches to the big challenges – where can CS best contribute?

3. Supporting the inclusion of diverse demographics

Presentation link

John Tweddle Citizen science keynote

COBWEB Project update- Dr Jamie Williams, Environment Systems

COBWEB is a collaborative European project that seeks to empower citizens to collect and contribute data for use in policy formation and governance. Led by the University of Edinburgh, the COBWEB consortium consists of thirteen partners from five European countries: UK, Germany, Greece, Netherlands and Ireland. The project started on the 1st November 2012 and runs for 4 years and is funded under the European Commission's Framework Programme. In Wales, a consortium of organisations is involved including Environment Systems, Aberystwyth University; Welsh Government and EcoDyfi (full partner list contained in the presentation).

Three subject areas:

1. Validating Earth observation;

2. Biological monitoring;

3. Flooding.

There are a number of Biosphere Reserves in Europe and the Dyfi Biosphere is one of them. COBWEB is engaging seven 'co-design' projects which are taking place in the Dyfi Biosphere Reserve. The projects bring together a wealth of local expertise in environmental projects, a vibrant community of volunteers and communities, and the expertise of the COBWEB researchers and developers. Working together, this co-design activity is running discreet projects that are contributing to the development, pilot data collection and the uptake of COBWEB project outputs.

Presentation link

Interactive session: - Framing nature: - tools for communicating about nature - Ralph Underhill, Public Interest Research Centre

In this interactive session Ralph Underhill from the Public Interest Research Centre introduced the concept of framing and demonstrated its importance in influencing the decisions we make for wildlife. A 'frame' sets the context for what a situation or discourse is about effectively it names the subject matter, and at the same time provides an angle for viewing it." Darnton & Kirk, 2010

Leading on from this:

"The more often the frame is activated, the stronger it gets. When it gets strong enough, the frame will define your 'common sense'". George Lakoff 2011.

In general: If you change the frame you change the response; when we define problems we imply solutions.

Reframing nature- talk about how awe-inspiring nature is and use pictures to demonstrate this. General concepts: facts aren't enough; collective action is important; explain the issue; give people opportunities to engage and to use their creativity; people are part of nature; don't put a price on nature; highlight the problem but don't overuse the threat message; show how small actions fit into the bigger picture

3 things to remember:

Framing changes the way you see problems & solutions

Framing influences our motivation

Not just about the media – it is relevant to all your work

Presentation link

Citizen science panel discussion

Key note address - Carl Sargeant AM Minister for Natural Resources

The challenge is joining up the various pieces of legislation to deliver for the environment. The Biodiversity & Ecosystem Duty in the Environment Bill is building on the Well-being of Future Generations Act (WBFGA) which include the 'Resilient Wales' Goal. The Nature Recovery Plan will be published by the end of the year which will be a big step in delivering for nature in Wales. As a living document it will be refreshed as national policy evolves. The environment is a shared challenge for us in Wales, how do we deliver? We need to recognise that change is often difficult. Measures included in the Rural Development Plan (RDP) will be key; aiming for win-win holistic solutions that deliver for the environment & the economy. Build on the EU Life Programme and Payments for Ecosystems and look for opportunities to dovetail these programmes. Celebrate success for example the progress made with the Action for Pollinators plan. Area based statements as set out in the Environment Bill will be developed and will inform our approach and the lessons learnt from the NRW area trials will also feed in to the approach. We face challenging times with shrinking budgets but the WBFGA and Environment Bill will create a platform for delivery. The environment is 'ours' and we have a collective responsibility to enhance the environment. Legislation will require us to do things differently and change the way we deliver services and there may not be the 'space' for 22 local authorities to operate in Wales. As the Minister responsible for this portfolio, I am willing to listen to new proposals on how we deliver for the environment.

Carl Sargeant AM addresses conference

Q&A Session with the Minister

Q. Colin Russell West Wales Biodiversity Information Centre. Environmental enhancement confers benefits to society that are universal and cross cutting. Is there an opportunity to divert money from other WG departments to fund environmental improvements in Wales?

A. WBFG legislation underpins what WG and other bodies will have to deliver a sits enshrined in law. Sustainable Development Commissionaire will police this and the Director Generals of all WG Departments to enhance integration. In the past collaboration across departments was optional now it will be enshrined in law. Will need to adopt a 'common sense' approach and for example use RDP funds to deliver for ecosystem and provide other multiple benefits.

Q. Leanne Bird (Ceredigion CC) & Laura Palmer (Neath Port Talbot CBC). LBAPS provide the link between policy and action on the ground. LBAPS are in danger of folding due to severe financial pressures and changes in grant structure so will be unable to deliver WG policy without LA officers in place. LBAPs have a network that is currently delivering for biodiversity and for sustainable development and this is in danger of being swept away. The cost of maintaining the network is minimal and many LBAP partners give up their time for free and contribute to WG objectives on the ground. We would welcome the Minister's presence at a LBAP meeting to see at first hand the range and scope of their work.

A. WG values the work you do and recognises the financial pressure and difficult decisions will need to be made across all portfolios not just those delivering on the environment. Very happy to listen to proposals on how we deliver locally and more than happy to attend an LBAP meeting.

Q. Sorrel Jones Gwent Wildlife Trust. Many in the conservation sector are excited about the new legislation but with the new legislation there will need to be accountability. Recognised that there is downward pressure on funding but it appears that the economy 'trumps' the environment for example in the proposals to commit significant funds to the M4 relief road around Newport and the Circuit of Wales should these proposals come to fruition. This comes at a time when there is a shortfall of funding to manage Wales' Natura 2000 sites.

A. I can't be specific about individual planning matters but in general principles we are moving away from a situation where the economy trumps everything else. The new WFG legislation will require us to do things differently. The challenge is to convert the new legislation into delivery. I will be robust with colleagues to see this happens. We can also build our Green Economy and levy money for environmental improvements and change the trajectory and vision for the environment within WG.

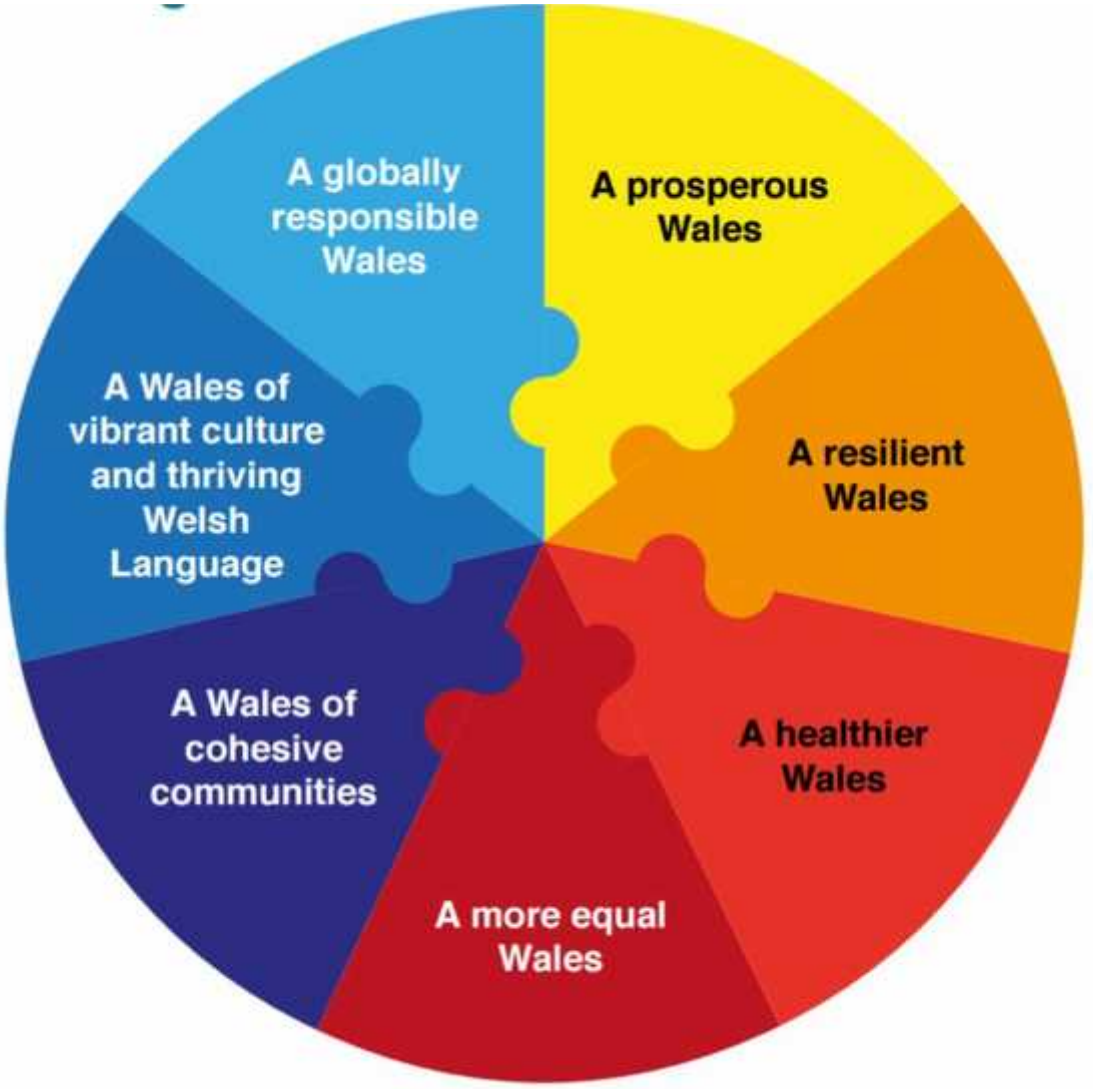
Q. Louise Owen, Welsh Government. There appears to be a reluctance to take biodiversity forward within Welsh Government departments. It would be good to demonstrate that we are doing our bit through education and incorporating biodiversity into our internal operations.

A. I will be meeting with the Permanent Secretary to challenge this position and as mentioned I will convene a meeting with all DGs across WG. WFG legislation is a 'game changer' and we need to be open and transparent in our approach and spell out the consequences of not adopting the principles of the new legislation. The new legislation is ground-breaking and attracted praise from the EU Council and if we get this right, Wales will be empowered.

Building resilience in Wales through the Well-being of Future Generations (Wales) Act and the Environment Bill– Emily Finney, Welsh Government

The presentation covered the coming into force of the Well-being of Future Generations Act and how it links to the Environment Bill to set the legal framework to both tackle key long term challenges like the decline in biodiversity and support Wales to identify the opportunities associated with green growth.

The Well-being of Future Generations is about improving the social, economic, environmental and cultural well-being of Wales. The Act puts in place seven well-being goals:



The Act will task Public Service Boards to improve the economic, social, environmental and cultural well-being of its area by:

• Assessing the state of well-being

• Setting objectives to maximise contribution within the area to the well-being goals

• Publish a Well-being Plan - taking reasonable steps to meet those objectives

The Environment (Wales) Bill was then outlined. The Bill sets out how we deliver the Sustainable Management of Natural Resources (SMNR). The Bill contains seven elements:

• Part 1: Sustainable Management of Natural Resources

• Part 2: Climate Change

• Part 3: Charges for Carrier Bags

• Part 4: Collection and Disposal of Waste

• Part 5: Fisheries for Shellfish

• Part 6: Marine Licensing

• Part 7: Miscellaneous

The Bill, amongst other proposals introduces a Biodiversity and Resilience of Ecosystems Duty which is designed to refocus section 40 of NERC Act 2006 for public authorities who carry out functions in Wales, so the requirements are in line with principles of SMNR. It will require public authorities to publish a compliance report before the end of 2019 and every third year thereafter.

Presentation link

Llŷn Ecosystem Project –Catrin Glyn, Llŷn Ecosystem Based Approach Project (Gwynedd Council)

This presentation focuses on a new pilot project located on the Llŷn Peninsula which has evolved from the work of the Special Area of Conservation of Pen Llŷn a'r Sarnau (SAC). The project has resulted from 'Striking the Balance', which is a document drawn up by the Welsh Fisherman's Association offering a management approach that would improve our understanding of the marine environment, promote recovery and resilience of ecosystems, without adversely affecting fishermen and local communities. This method aims to protect the cultural and economic life and protects traditional fisheries and recreational activities. Therefore the Pen Llŷn a'r Sarnau SAC and the Welsh Fisherman's Association are co-leading the project which reflects the fact that conservation and the fishing industry can go hand in hand, and places great emphasis and co-management and consulting.

The project is based around the Llŷn Peninsula and is a Nature Funded project with financial support from Seafish for some elements. The project looks at ecosystem based management of fisheries, and linking in with the work of the existing Pen Llyn a'r Sarnau SAC Partnership. There are a number of pieces of work within the overall project:

1. Ecosystem based approach
2. Co-management
3. Fishing for litter
4. Cetacean Pingers
5. Code of Conduct

The project is being facilitated by Alison Hargrave (Pen Llyn a'r Sarnau SAC Officer) who represents the existing SAC Partnership. The above are actions stated in both the Pen Llŷn a'r Sarnau's management scheme and in NRWs Actions Database.

Presentation link

River Dee Invasive and Non-Native Species INNS project-outputs, learning and next steps – Adrian Lloyd Jones, North Wales Wildlife Trust

The Dee Invasive Non-Native Species Project (DINNS) is a catchment-wide partnership initiative which aims to coordinate the control and monitoring of Invasive Non-Native Species within the Dee catchment to ensure a joined up approach to INNS management is delivered.

The Dee catchment comprises 21 lakes and 753 KM of river and encompasses SAC, RAMSAR and SSSI sites and shares a border with England. The catchment supplies 3million people with drinking water. INNS There are a suite of invasive non-native species (INNS) in the catchment including Himalayan balsam, Japanese knotweed, giant hogweed and Chinese mitten crab. Himalayan balsam is a major issue in the catchment and the project has almost entirely eliminated balsam from the River Alyn working from the source downstream.

The project is managed by a steering group of 9 organisations and has developed a strategic action plan. The plan set up a baseline; identified key objectives and actions; and identified priorities. The project has mapped the extent of INNS, carried out control measures, raised awareness of biosecurity (Clean, Check & Dry campaign) and produced INNS ID leaflets and run awareness day events. The project utilises volunteer river guardians mainly drawn from the angling community who report back on issues, liaise with landowners and carry out INNS control.

The DINNS project is instrumental in improving SAC status of the Dee Estuary and in achieving 'good status' under the Water framework Directive utilising a partnership approach.

Q. Martyn Evans Monmouthshire CC. There is an increasing problem of Himalayan balsam on the River Usk. How do you deal with the balsam - is it flailed of sprayed?

A. The majority is hand pulled, scrunched up and left to decompose away from the river bank. In some circumstances areas are sprayed if too large to tackle by hand pulling or are cut (below the first node).

Dave Thorpe NRW. The catchment covers three major abstractions so physical control is the most appropriate method to minimise pesticide (glycosphate) entering the river.

Presentation link

Closing summary – Madeleine Havard, Natural Resources Wales Board Member

The key thing from the two days is that is has brought the biodiversity community together and this is important for us all to support each other's endeavours. The first day focused on the concept of

resilience and the second day followed this up with examples of projects from regional and local levels. Often it appears the strategic policy objectives and the local delivery is out of step but with the new legislation this is pulling together and producing ‘joined up’ working. The conference has covered the importance of awareness of the natural environment and todays interactive session highlighted ways we can communicate more effectively. In term of governance, the Minister has attended every WBP conference and in this year’s address, the Minster was honest about the reality of the current financial conditions but showed he is committed and supportive of positive outcomes for the natural environment. The minister is actively engaging with cabinet colleagues to leverage action to support the new legislation but he challenged the biodiversity community to ‘do things differently’.

This is critical- we need to work with others, collaborate and innovate. The time is now opportune to genuinely ‘do things differently’ rather than just use rhetoric. Importantly we must remain positive and be clear on the outcomes we want to achieve around a resilient Wales, healthy ecosystems and addressing biodiversity loss. We have an active constituency in Wales to deliver from local to national. These are exciting and challenging times and ultimately it is down to us to deliver.

Madeleine thanked all the conference contributors and the audience and wished them a safe journey home.

Workshop summaries

Natural Resource Management Workshop – Feedback

Diana Reynolds, Welsh Government

Good stuff…	Opportunities for improvement…
Diana is a good facilitator - thought provoking	Give some examples of how the Welsh Government has changed in response to the requirements of the ecosystem approach – • Design of the Wellbeing of Future Generations Act and other legislation • Some improvements in behaviour e.g. more often saying 'How can we help?' rather than 'No, we can't'. • A commitment to collaboration and various attempts at doing this in practice e.g. Communities First, Pollinators Action Plan, Nature Fund, Environment Grants • N.B. we still have a lot to learn!
Very useful and thought provoking	Include economics (especially principle 4a) How do we value benefits (not necessarily in ££s) especially those benefits we require and yet are oddly given the least or little £ value? (we take for granted our air, water and cheap food). • Possibly see: http://hajoonchang.net/ or http://sacred-economics.com/ for further insights…
Found this a very useful workshop in making a concept practical.	May be some case studies would be useful? • I think we used to have some on the Natural Environment Framework website and I think the new approach to communications will add examples to the Wales Biodiversity website
Setting out the seven principles was a useful spur to thinking about how to add value to our work, from the point of natural resource management.	Allow more time! Using case studies to illustrate concepts can be very useful as it helps spark discussion.

	• May be we could analyse/score a case study (in the same way as we did our own work) before tackling what we do ourselves?
Very useful to discuss and share ideas and experiences with people of other organisations.	It is an intense workshop – might be easier on attendees to have one or two more (shorter!) discussion periods. Everyone digressed too much as they got tired. • Ironically, apparent digressions can often hold key information about the topic in hand. When this happens we can ask ourselves: how is this *really* related to the topic we are supposed to be discussing? Why do we prefer this alternative topic? Can we reframe to include both these ideas? (See Ralph's conference talk/exercise.)
The workshop was interesting and stimulating – made me think about my work differently – better than I thought it would be.	Smaller groups • One of the tables had 11 and one had 5. I should have spotted this earlier and adjusted the sizes
Pair and share works very well i.e. allows more detailed exchange of ideas.	Could be targeted at audiences of similar work areas. This would encourage us to drill down into the details (problems?) that exist.
Diana was a good lead for an outsider perspective as everybody is too engrained at their own jobs.	I forgot to move on form scoring my piece of work to see how I could improve – maybe I needed a prompt to do so.
Let's set a vision for Wales and stick to it.	Lets get a vision for wales and stick to it. • See various conference talks and/or page 6 of the Wellbeing and Future Generations Act Essentials at: http://gov.wales/topics/people-and-communities/people/future-generations-bill/?lang=en.
Do develop, think long term. Very thought provoking.	Please could we have regular mixed NRW and NGO workshops of this kind.

Pollinator Town workshop

Bleddyn Lake, Wales Action Plan for Pollinators

Group 1

- Do we want to focus on towns? Do we also focus on schools/youth groups/churches etc?
- How do businesses demonstrate they are acting for pollinators
- Could we encourage areas to have a 'pollinator ambassador'? And have different levels of achievement?
- Idea for name – Buzz Towns
- Have a pollinator logo sticker for individuals or at a community level
- Can we use Streetlife.com?
- Could we have a pollinator flag similar to the Eco Schools flag?
- Would it be easier to combine with other schemes?
- Involve NGS and NT gardens?
- For the certification – we could have a list of possible actions, some easy and free and some more complicated
- Towns/areas could tick say 5 for basic certification and send photos in of each one and then more actions completed for higher levels of certification?
- Include private gardens in towns and villages as people willing to spend money on their own gardens e.g bee hotels
- Need demo areas? Do we need this first to build on?
- Having criteria is a must for local authorities and community councils
- Self-certification – before and after photos, list of actions to do and have a date fag/sign system that denotes how long the town has the status for (eg 2 years)
- How do we sell the benefits of the scheme?
- Email a PowerPoint to every school
- Scheme for an exemplar area in each local authority area
- Flagship business awards
- Target supermarkets car park planting
- Decide on a logo
- Do we have a budget?
- Can we have a Bee-Advisor like Trip Advisor
- Could we start in Ystradgynlais where the Tesco store has £2000 available to spend on biodiversity enhancement (with Powys Council)
- Strapline – 'creating a better place to bee'
- Have a bee/pollinator blog
- Could have a similar thing to Where's Wally called Where's Polly (pollinator) – i.e spot the bee
- Get people to post bee-selfies on social media from pollinator schemes around the country

Group 2

- Criteria for scheme?
- Checklist?
- All or nothing?
- Not too easy
- Should we push towns to do more?
- Pull together supportive guidance from existing schemes (eg habitat needs or road verge schemes in Monmouthshire)

- Do we ask for a longer term commitment i.e not just 1 year
- Also add a recording element to it (OPAL, LRCs, COBWEB)
- Make sure we feed back to people
- There is an issue of native and non-native species so we need added info and guidance
- We also need to provide downloadable signs and logos, a certificate of some sort, criteria, how does it apply to others eg schools and businesses?
- Is it annual? Does it need to be re-applied for annually? What is the Fair Trade Town model? Would Welsh Gov evaluate after 3-4 years? Do we compare impact with non-pollinator towns?
- Self-certification – is this an admin burden? Do we have different levels? (eg 'working towards'. Pitch it as engagement and education rather than more scientific conservation. Need 'ownership' by the community
- Sectors – do we have numerous? Pollinator schools, pollinator businesses.
- Who else to engage with this? Scouts/guides, Wales in Bloom, beekeepers, WI, Merched Y Wawr, agricultural shows (pollinator class).
- Do we target LA's and/or town or community councils
- Town parks? Housing developers? RSL's?
- Different levels of the scheme? Keep it simple at first and develop further if demand develops. Could a 'phase 2' be more involved e.g 'adopt a species' which would become more specialist and come with more support and guidance and downloadable signs?
- The big launch – approval of existing best practice towns/areas? Do we have 5 across Wales for e.g? Launch in Spring 2016?
- Other issues? Funding, especially for 3rd sector. Do we need to have better co-ordination of existing funding sources?

Group 3

- Name – consider translation into Welsh. Maybe have 'bee' in the title and 'pollinators' as a strapline? Use the word 'buzz'? Make it short enough for use on road signs. Could we even do it as an image or logo only? Could we even run this as a competition via Facebook for example?
- Criteria – allow towns/areas to choose from a selection of criteria. How many? 5 like Fairtrade Town model
- Or have different sections of multiple criteria and allow a choice from those
- If 'engagement with the Council' is a criteria then is that too intimidating for small groups to start with?
- Some engagement with retailers and businesses on food issues which could have a positive social benefit too
- If we work with schools is there a health and safety worry for them?
- Can we integrate this with the new schools education packs?
- Could we have an annual 'pollinator day' or 'pollinator week'?
- Self-certification scheme – are there any examples of this? Would need downloadable resources and logo. Is there a 'training' element to it or e-learning? Use WBP website to host this scheme
- Levels of certification – No, keep it simple, just one level
- Would need good links to other organisations with resources such as Pollinator Resource List
- Is this an annual scheme?
- Target different sectors? Yes. We need to be as open and engaging as possible
- Launch Spring 2016. Maybe one community launch in north Wales, one in south Wales. Lots of publicity, use of celebs?

A copy of the pollinator workshop presentation is available on request

Pollinator Towns workshop

Questions for workshop facilitators and their sub groups

1. Suggest a name for the project, something that is short and snappy and works in both languages
2. What should we include in the criteria for a community wishing to do this?
3. How could a self-certification scheme work in practice? Any good examples of this?
4. Should we have different levels of certification, e.g gold, silver, bronze?
5. What would we need to produce to accompany this project? Website, information links etc?
6. Would this scheme be an annual one whereby a community would have to renew the things it does each year or is it sufficient to do this once and let communities carry it on themselves?
7. Should we target a range of different sectors e.g should we have a separate scheme for businesses, schools etc or should we start with communities first and see how that goes before expanding it?
8. How can we best share these positive examples with others to highlight good ideas e.g Facebook page?
9. When and how would be best to launch this?
10. Would anyone like to be involved with the Taskforce sub group taking this forward?

Long Forest development Workshop

Steven Bromley, Long Forest Development Manager

A brief introduction was give so not to influence answers. Participants were divided into two groups. Each group where given A2 sheets of paper with three questions:

What makes a good hedgerow?

Group 1)

Berries/Fruit
Good range of species
Good connectivity

Appropriate management
Stock proof
Good ground flora
Good management of adjacent land
Well used by species
Age/historical connections
Traditional methods
Standard trees and replacement trees (structurally diverse)
Visual appeal in the landscape
Variety – old and new hedges
Heritage value
Absence of invasive
Continued traditional trades
Accessible
Shelter

Group 2)

Species diversity; plants and animals
Good condition; structure
Height
Width
Un-fragmented
Understory
Age diversity
Well managed including hedge laying, rotational
No invasive/garden plants
Adequately protected; physically, legislation
Stock proof
Appropriately located

Why are hedgerows important?

Group 1)

Cultural and heritage
Wildlife Corridors
Food
Shelter
Sloe gin
Habitat
Species; Dormice, Dunnock, thrushes
Ancient woodland plants
Mammals
Invertebrates
Landscapes
Skills
Stock management
Fuel
Flood risk management

Group 2)

Landscape Feature
Shelter
Livestock
Cultural/historic importance
Soil erosion +fertilizer run off prevention
Food for people and wildlife
Wildlife corridors
Flood alleviation
Boundary markers
Pollination
Research
Habitats

Threats to hedgerows

Group 1)
Deliberate destruction
Bad/lack of management
Deer
Grazing
Badgers
Lack of management on adjoining land
Disease
Wrong species
Lack of use of local species
Lack of knowledge
Cheap and easy alternatives
Ignorance to value
Lack of regulations and enforcement
In appropriate/accidental spraying
Loss of traditional skills don't look tidy
Development and poor mitigation
Over treatment
Group 2)
Removal
Lack of management; traditional skills, funding
Too much or inappropriate management
Edge effects from land management - nitrification
Livestock and deer
Chemical drift
Lack of appreciation/apathy
Lack of funding
Fragmentation; 'gappy' hedges, no longer functioning
New plant diseases
Urbanisation litter collection, no native garden invasive
INNS eg Himalayan balsam

Overall, the workshop forged links with potential partners to enhance the project and strengthen delivery.

Summary of workshop session (Dyfi Biosphere field excursion) Biodiversity monitoring techniques in the Dyfi Biosphere Reserve

Peter Dennis (IBERS, Aberystwyth University)

Consistent with the conference theme, this outdoor workshop, hosted at RSPB Ynys-hir within the Dyfi Biosphere Reserve, explored a variety of methods available to monitor and detect progress towards nature recovery in Wales.

The sampling methods, measurements and analytical techniques available to monitor biodiversity were demonstrated and discussed during the field excursion. Using a number of information stations set up at Ynys-hir nature reserve the following methods were presented to participants: remote sensing applied to habitat monitoring (developed on Cors Fochno by Becky Charnock and presented by Lucy Hill, Aberystwyth University); engagement of the public in biodiversity recording (e.g. COBWEB) presented by Beverly Dimmock and Monica Lloyd-Williams, RSPB and Jamie Williams, Environmental Systems, Swansea, who represented the EU COBWEB project; use of meta-DNA barcoding methods to detect the unseen biodiversity of soils by Andrew Detheridge, Aberystwyth University; and direct indicators of biodiversity recommended for European farmland by the recent EU BioBio project, namely X-plots used to survey vegetation in the EU BioBio programme (and UK Countryside Survey) presented by Will Stiles and methods to sample earthworms, wild bees and spiders, demonstrated by Peter Dennis.

The organiser, Peter Dennis, provided a general introduction to the workshop and distributed maps of the information points during the coach journey to Ynys-hir and on arrival, Beverly Dimmock provided a general welcome. Jamie Williams gave a short overview of the EU COBWEB project and Beverly Dimmock and Monica Lloyd-Williams introduced the associated Smartphone App developed by RSPB to monitor vegetation change in an area of salt marsh restoration within the reserve. The 18 participants were also directed to a questionnaire prepared by Peter Dennis to record comments and feedback related to each of the demonstrated methods. Three prior questions were asked to provide a context for biodiversity monitoring:

1. At intervals of what duration do you consider it is desirable to measure biodiversity? Why?
2. What do you consider are meaningful changes that we need to detect through monitoring?
3. How is information on change in biodiversity best communicated to those responsible for its recovery?

Synthesis

This paragraph summarises answers to the three contextual questions (Appendix 1). The participants were interested in monitoring to detect change at weekly to five yearly intervals, dependent on the

precise species or habitat in question and the objectives of management. The consensus appeared to be an annual frequency of survey for monitoring purposes. Monitoring was required to detect change in a wide range of parameters: abundance, presence or absence and distribution range of particular species; species richness and species composition of selected taxa and also the extent and condition (also described as health or quality) of habitats. There was no clear position on an individual parameter as a focus for surveys in a monitoring programme. Finally, the preferred form of communication of monitoring results was to produce a mapped representation of observed changes in distribution (atlases) or quantities such as abundance. Alternatively, simple summary reports were considered useful, such as used to present data in the State of Nature report. Supplementary data accessible online, was also desirable to substantiate the accessible summaries. Workshops for relevant staff of stakeholder groups would be valued to communicate the latest biodiversity trends or changes of status but also to discuss implications for policy and management.

There was great interest in the RSPB plant survey App for smart phone or tablet, developed with COBWEB (Appendix 2a). Many participants commented on the ease of use, ability to collect substantial data in a short time and the important associated function to promote public engagement and education in nature conservation. The limited amount of detailed information and limited opportunity to verify identifications for quality control were considered to limit the level of precision and range of applications of this method. A formal link with Local Record Centres was considered essential to assure data storage and access so that trends could be regularly assessed for surveyed habitats. The crowd-sourced data from this exercise are presented as part of the separate report on the COBWEB workshop of conference day two, contributed by Jamie Williams.

The selection process for the direct indicators of biodiversity recommended by the EU BioBio project included evaluation of numerous pre-existing biodiversity indicators (Appendix 2b). Each was selected if scientifically sound, applicable across farmland of all European countries and relevant and useful to stakeholders. Hundreds of candidates were assessed in expert workshops and were eventually reduced to five indicators that represented local to landscape conditions and different trophic levels of ecosystems (equated to ecosystem services). Farmland birds were automatically selected based on the Pan-European Common Bird Monitoring Scheme and substantial stakeholder interest in this group, so BioBio focused on formal evaluation of additional indicators, namely plants (for both diversity and primary productivity – sampled once with X-plot as devised for the UK Countryside Survey), earthworms (detritivore and role in soil fertility – sampled once with three 30 x 30 cm soil cores to 20 cm depth), wild bees (herbivore-pollinator guild with role in pollination of food plants – sampled on three occasions with timed walk along 100 m transect, using similar 2 x 2 m window and weather thresholds as for a butterfly walk) and spiders (predator and natural enemy of crop pests – sampled on three occasions with five suction samples). Interestingly, plant bugs, which are effectively sampled with suction samples, were advocated as indicators by Mike Wilson during this conference, but were not short listed during the scientific evaluation in BioBio due to concerns about identification and a lack of expertise and also did not resonate with stakeholders as an indicator likely to appeal to the public or customers (for instance as consumers of food products associated with organic production or a Protected Geographical Indication). The practical methods of survey were demonstrated as they would be applied to each category of parcel and line feature mapped across each target farm, in a prior farm habitat survey of cultivated and grazed vegetation as well as semi-natural habitat parcels (e.g., wetland, woodland and ponds) and linear features (e.g., hedgerows, waysides and stream banks). This was followed by a short discussion and general consensus was evident in the feedback. The accuracy, reliability and scientific quality of the data

were appreciated by all participants but equally, the time, effort (significant cost) and need for expertise were recognised as impediments.

Participants were impressed with the potential of the DNA meta-barcoding to accurately reveal the hidden biodiversity of soils and in particular the potential to detect species of fungi throughout the year, for fruiting species, and also to detect non-fruiting species (Appendix 2c). There was also interest in what the detected assemblage can reveal about the management history of the site, in particular the history of cultivation or applications of nitrogen fertiliser. The cost and availability of the technical apparatus and trained expertise were seen as difficulties for use of this method.

The analysis of vegetation from remote sensed information of sites, such as the lowland raised bog at Cors Fochno, were appealing to participants (Appendix 2d). The broad coverage, application of the approach to remote, sensitive or large sites were recognised as strengths. Participants also appreciated that the ability to recognize the characteristic vegetation species at different times of year would allow repeat assessments for habitat condition monitoring. The high cost of this complicated, technological approach, of additional vegetation survey at target sites to verify suggested trends and the broad brush results were concerns raised by participants. There were aso questions asked about the specific costs for the purchase of appropriate remote sensed images and the reliability of the image analysis when certain species such as *Sphagnum* can change according to external stimuli other than season. Several people wanted to know whether nitrogen concentration was also taken into account during the development of the method. General agreement that this could be a useful model for determining plant species present, especially at large or inaccessible sites, and the potential of this method in the development of habitat suitability models for particular species.

In conclusion, the relative merits of the demonstrated methods were appreciated in the context of detecting changes in biodiversity. The culture of financial constraint in the sector tended to strongly influence views on the future uptake and use of the methods, with reservations expressed for those based on specialist, technological procedures or dependent on trained specialists. The use of technology in the form of smart phone Apps to crowd source information was popular but there remained the limit to what could realistically be recorded and the uncertainty of data quality for use in the assessment of trends. The dilemma is that survey methods with the necessary precision to deliver the monitoring information outlined required by the participants in the opening questions, is only realistically delivered by the more expensive, scientifically credible monitoring options.

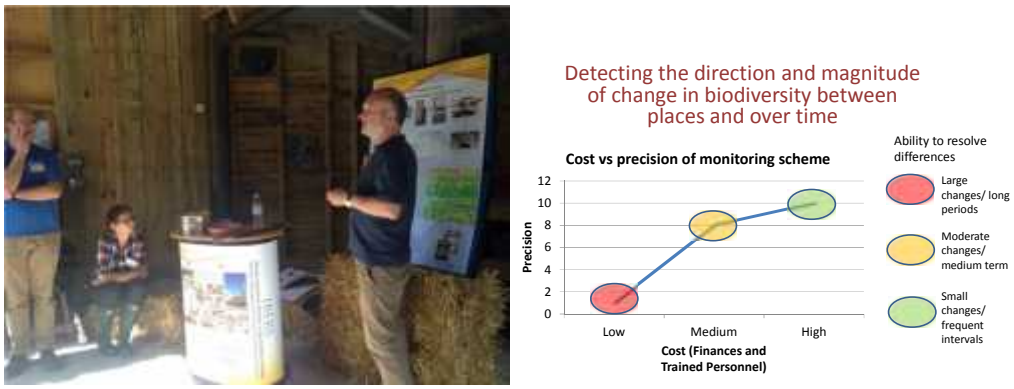


Figure 1. Biodiversity monitoring techniques workshop. Top left: Information station where the sampling methods for EU BioBio indicators of spider, wild bee and earthworm monitoring was demonstrated; top right: Will Stiles describing the X plot for botanical survey within EU BioBio; lower left: Andrew Detheridge describing the DNA meta-barcoding method to detect soil fungi; and a representation of the classic monitoring trade-off as a context for all of these methods.

Appendix 1. Responses to the three contextual questions about biodiversity monitoring.

Question no.	Summary of responses
1	1. Depends on the habitat for recording change, different habitats and species change at different rates. Two-five years to record change OR if conditions/ environment are changing before and after such a change. 2. Depends on the target species/ habitat and how often their environment and range is likely to change. Depends on purpose of the monitoring, e.g., where environment may change more regularly, need to determine impacts, e.g., urban areas and development. 3. Weekly surveys for yearly monitoring – as often as possible to obtain an accurate idea of trends and to factors which may have caused change. 4. Annually, because significant, catastrophic change often happens quickly when it does happen. 5. Yes, to monitor progress towards nature recovery and maintaining condition of sites. 6. Annually and to look at long term change. 7. Every five years and more often at sensitive sites. To detect change early without being overly onerous. 8. As much as possible dependent on what is being targeted. Every year is probably desirable but costly, minimum every five years. 9. Depends upon objectives but resource to support long-term, repeatable monitoring is the key.
2	1. Extent and health of habitat, distribution and number of species. 2. Changes in the population size, range and extent for most species but may just need presence or absence on a wider scale for some species groups. Depends upon the use of the data. 3. Changes in the population size and community (species?) composition. 4. Major changes in habitat change. Significant abundance changes in keystone species or overall species richness. 5. Changes in habitat condition or losses. Declines in species. 6. Vegetation succession, significant change in species composition or soil moisture (depending on environment). 7. Species number, range and abundance. 8. Species numbers and indicator species. 9. NA.
3	1. People do not read big reports but reports required to verify changes. Face to face meetings and through visits if Welsh Government provide funding for ground staff to meet and participate in site visits. Wider public need: interesting stories that apply to them. 2. Maps with GIS data behind the presentation. 3. Needs to provide positive solutions for recovery and be accessible and understandable to a wide audience as many sectors of society are responsible. 4. Annual “State of Nature” type reports coupled with ‘live’ online data summaries. 5. Depends on your audience. 6. Number of species present. Significant changes in number of keystone and protected species. 7. Mapping tools showing change over time. 8. Mapping. 9. Through an overarching Wales biodiversity hub, ideally, where information is stored, collected and shared within a useful time frame. Role for LRW.

Appendix 2. Feedback on the relative merit of the various biodiversity monitoring methods demonstrated during the workshop.

Demonstration	Strengths	Weaknesses
a. COBWEB Crowd source App	1. Lots of data available at relatively low cost. Engages wide range of people. Good App could be very useful tool for projects over a wide area. 2. Great educational app for condition surveys. Records the data straight away. Allows for more data to be captured. 3. Very simple and easy to use. 4. Easy to use, potential to capture large amounts of real time data. 5. Easy to use. Useful educational tool. 6. Easy to use and understand. Very little cost per survey and can gather lots of data cheaply. Engages public in survey. 7. Ease of collection and public engagement. 8. Easy to use. Appealing for children. Can enable data to be stored in single place. 9. Easy to use and good public engagement tool.	1. Not very detailed information with a need to collate the data. 2. Will require expertise if to be used in policy unless very specific, easy to recognise data are collected. Time consuming. 3. Possibly not applicable to many situations, especially with the lack of vegetation and species. 4. Non-specific data. 5. Cannot see application to full ecological survey. Robustness of data and usefulness of data 6. Simplistic data categories. Not freestanding on device, needs paper handouts. Data quality control is an issue. 7. Uncertain quality of data. 8. Requires computer literacy and maybe too general. 9. Quality of data – lack of skilled verification. Danger of lack of integration with LRCs and creation of another data hub.
b. BioBio Direct measurements of biodiversity indicators	1. Good comparison across countries. Detailed results on the number and density of species. Good habitat extent records. Good idea of farming and biodiversity in a snapshot and engages farmers. 2. Great for per area comparison and is scientifically sound. 3. Replicable across a wide range of habitats. 4. Accuracy, robust datasets. Applicable at Europe-wide level. 5. Robust dataset and replicable. 6. Very detailed identification to species level for most taxa. 7. Excellent quality of data. 8. Good. 9. Precision data for multiple taxa.	1. Expensive, time consuming and weather dependent. Variation between surveyors. Narrow range of indicators. 2. Costs and time of some of the surveys vs how much accuracy you need. 3. Limited and less applicable at the extreme ends of the habitat spectrum, e.g., very arid farms or hill farms. 4. Large time/ experience input. Lack of enough expertise. 5. Expensive and requires a good deal of expertise. 6. Needs experience and expertise and very time consuming so expensive if using experts to identify specimens in samples. How widespread/ often can you do this? 7. Cost and time. 8. Lack of accuracy and time consuming. 9. Relies on good numbers of trained taxonomists. Potentially costly.
c. Detecting the diversity of fungi in soils (DNA meta-barcoding)	1. Accuracy and ability to detect fungi when not fruiting, so monitoring can be done at any time of year. 2. Can be done all year around and therefore can feed into policy. Seems very accurate. 3. Provides data on a previously hidden world (non-fruiting fungi) and access to fungal data throughout the year. Also, evidence of historic field use to some extent. 4. Accuracy, picking up a large amount of data for relatively small input. 5. Robust data. Pick up below ground	1. Expensive. Can this inform management? Rather specialist. 2. Does not provide an indication of the vegetation, just the length of time undisturbed but still useful. 3. Not yet to species level but apparently that will soon be resolved. 4. Very specific to a particular assemblage. 5. Need access to relevant equipment and expertise. 6. Depends on high-tech equipment. Can it be extended to other taxa where ecological importance is better

	ecology not obvious and potentially missed by other surveys. 6. Simple sampling protocol and large number of taxa identified at once. 7. Quick, cost effective and comprehensive. 8. Accurate and reliable. 9. Can be done at any time of year. Lots of potential applications (condition monitoring, EIA vegetation surveys).	understood? 7. NA 8. NA 9. Cost of analysis.
d. Remote sensing to assess vegetation change and habitat quality	1. Survey time on the ground – able to detect areas to visit for ground survey. Depends on accuracy of information input, e.g., seasonal changes in *Sphagnum*. Covers large areas. 2. Great for not disturbing habitat which is sensitive. Once the data are collected, can be great for monitoring. 3. Potential for use in sensitive, difficult to access or large areas. 4. Can give very good, large-scale data to indicate long-term changes. 5. Useful for wide-scale survey and inaccessible sites. 6. Covers large areas at once. 7. Quick for landscape scale. 8. Large areas can be seen. Limited compaction on site. 9. Good potential for long term repeatable monitoring once baseline established and satellite signature for key species obtained. Good potential for large sites and INNS monitoring.	1. Broad brush and high cost of survey. 2. Very costly and time consuming to ensure that it is accurate. 3. Expensive. 4. NA 5. Expensive and needs ground-truthing and complicate programming. 6. Ground-truthing needed and is expensive. 7. Inaccurate and broad brush. 8. Costly and requires lots of hours of effort. 9. Time intensive. Expensive to obtain the required, detailed imagery. Still requires ground-truthing.

HLF Workshop

Lead: Julie Hughes HLF Cymru
Facilitator: Anne MacDonald (NRW)

The workshop on HLF funding was an interesting mix of information and activities which the participants found to be useful and engaging.
Julie emphasized that 'Natural Heritage' covers biodiversity-type work in its own right, so you don't have to feel you need to find some historic 'hook' on which to hang your project for it to be eligible as 'heritage'.

When asked what their 'natural heritage' was, the participants came up with: Southern Damsel Fly, Seabirds, Meadows, Bugs, The Sea, All natural habitats, Microworld, Wetlands, a Botanic Garden in North Wales, & Veteran Trees.

Barriers to application identified were:

1. There needs to be a development stage for 'Our Heritage' projects (up to £100K) to allow for extensive community consultation.

2. Need someone to apply – it's a bit daunting for small community groups.

Solutions to these barriers:

1. Consider a development stage for projects under £100K'

Wales Biodiversity Partnership Conference –LIFE workshop

LIFE Natura 2000 Programme/ Natural Resources Wales

Barriers

- Providing up to date funding opportunities and windows
- Need for support by a specialist
- Need to advertise opportunities e.g. on WG website
- Size of bid – capacity and resources needed to be able to compete for the bid
- Lack of match funding from NRW and WG – this needs to be confirmed
- Short term nature of current NGO conservation staffing (longer term funding would pay for staff)

Comments on LIFE bid projects in development

- Sand dune bid – what is the conservation action?
- Marine pathways project – over stretched - too many pathways, too many variables (e.g. ballast in tankers). Have the proposers spoken to WG Marine policy leads?
- Meirionnydd Oakwoods is ongoing (e.g. rhododendron bid)

Role of LIFE forum

- Needs to be tight, focussed and well managed – can become part of the solution to some of the barriers
- Focus on forthcoming bids and forging partnerships – organisations don't know which project are being developed
- Learning from past/failed/successful bids – need to collate this information
- Could be a wider European forum, not just restricted to LIFE bids
- Could share info on bids under other EU programmes e.g. INTERREG
- Training needs to be focussed on people who are actually preparing the bid
- RDP model – need 100% intervention to develop bids. Will JNCC do this? Should NRW support this? Individual organisations can't develop bids – they take 9 months.
- JNCC role – should be complementary and avoid duplication
- Need to engage other sectors right at the beginning
- Need a central point of contact in Wales
- RSPB Wales has WG funding :
    - Bid development
    - Workshops, pulling partners together
    - 40-60 days per year, for 2-3 part time people
    - Hoping for 2-3 major bids
    - BETA Europe training
    - Developing internal expertise

Workshop Summary: A demonstration of Citizen OBservatory WEB (COBWEB) Project, and how it could work for you in the future

Dr Jamie Williams, Senior Environmental GIS Consultant, Environment Systems

The COBWEB Project is a collaborative European project that seeks to empower citizens to collect and contribute environmental data using mobile devices (smartphones and tablets). These data will be suitable for use in research, decision making and policy formation.

During the 2015 Wales Biodiversity Conference, delegates from a variety of ecological backgrounds and fields of employment convened to learn about and discuss the COBWEB project.

COBWEB relies on what is known as crowdsourcing; information (data) collected by an undefined 'crowd' of people. There has been an unprecedented growth in the popularity of mobile devices, many of which are equipped with Global Positioning System (GPS) sensors and available with internet connectivity. Consequently, there is significant potential for citizens to act as sensors within the environment that they live, collecting data with their mobile devices. COBWEB seeks to design a suitable 'software infrastructure' to facilitate and make this possible, ensuring that the data collected by citizens is reliable and trustworthy enough for governments and researchers to use.

During the workshop, delegates were introduced to the COBWEB project and shown how anyone can use the COBWEB portal (website) to set up their own 'citizen science' survey to collect data. Next, delegates searched for butterflies around the Aberystwyth University Campus and recorded their observations on a mobile phone. Following this, the data collected were viewed online on an interactive map.

Participants were then given the opportunity to discuss how and why crowdsourcing and citizen science are useful in the field of biodiversity and how data collected by citizens can be made reliable and interoperable. It was discussed that crowdsourcing/citizen science is:

- an extra tool in an ecologists kit as a means to collect data and engage the public with science,
- not meant as a replacement for field ecologists and other, more stringent surveying techniques but rather a complementary activity
- generating more information (data) about our environment and that these data need to be interoperable

If you would like to know more about the COBWEB Project, please visit the website: cobwebproject.eu

This project has received funding from the European Union's Seventh Programme for research, technological development and demonstration under grant agreement No 308513

Glastir Small Environmental Grants Workshop

Carol Driver & Catrin Cullen, Welsh Government

Introduction

Carol Driver (WG) provided the group with some background to the scheme:

- The scheme is open to all land owners and will allow those who have traditionally more productive land a chance to access capital investment funding under the capital works for Glastir.

- The scheme is completely new and development hasn't begun yet and therefore the group is being asked what the scheme should focus, would they would like to see funded and who should WG involve.

Discussion

Some members of the group questioned as to why funding needed to be capital works only and it was explained that scheme will be funded under sub-measure 4.4 of the Rural Development Regulation, which means items can only be used for non-productive investments. So anything funded, cannot directly increase the profitability of the farm.

Some members suggested that the scheme should not target areas of Wales where Glastir Advanced is already targeting; it needs to be pan Wales in order to show that we are not giving an unfair advantage. The problem, however with this is that the budget won't stretch far enough to fund everything. So for example, if you decide to include hedgerows, there won't be enough money to fund every hedgerow. Some restrictions need to be put in place. The small grant scheme needs to be complementary to sustainable farming. The old CCW hedgerow scheme is a good example.

Cross departmental benefits were mentioned as something to look at. River flooding, for example would gain multiple benefits.

A grazing package funding items such as pens/fencing/troughs would be desirable.

It was pointed out that some of the options on the opportunity maps were not being taken up. We may want to concentrate on these, for example replacement trees.

It was suggested that we target those that are not coming into Glastir because it doesn't make sense to them. They feel isolated from the involvement in biodiversity, not that they particularly want to be. Although the Welsh Government cannot target certain farmers, industry bodies will be able to target their members.

Concerns were raised about how the scheme will be delivered, especially in terms of advice/project officers on an advisory body.

The group felt that without an advisory body, the scheme would fail on environmental outcomes in terms of making the scheme meaningful, not all hedgerows will deliver the same benefits and therefore it was imperative that the advice was there to be given to farmers. A suggestion was made to top slice payment rates in order to pay the advisory groups for their service.

It was suggested that based on what was being said the easiest things to fund are the linear features as these will administratively be the easiest and they have multiple benefits, for example ponds have huge benefits if placed in correct areas which is why advice is so important.

The Group felt that Welsh Government needed to add value and look at what's currently being paid for under Glastir Advanced. People dropping out of Glastir Advanced would be detrimental.

This needs to be a two pronged approach, perhaps we could give more points to those working collaboratively, someone suggested.

The group then went on to discuss the online system. They feel and had feedback to support that farmers find the online process very difficult. A lot of people out there are not computer literate. Intermediary bodies are already helping. It would be useful for WG not to say the online system is easy as it creates frustration within the industry.

If WG are going to cap the grant at a minimum, they should really consider what this figures should be, for example there is no point capping at £500 if it achieves nothing.

Lastly the group were asked if they could give am idea of their top three capital items for funding for this grant what would they be. The group came up with the following:

- Hedgerows
- Ponds/wetlands
- Tree planting
- Grazing package
- Stone faced walling
- Orchard trees

WG informed the group that there would be further workshops in the autumn.

Freshwater ecosystems – s42 priority biodiversity workshop

Wales Biodiversity Partnership Species Expert Group

The workshop was presented by members of the Wales Biodiversity Partnership's Species Expert Group: Dr Liz Howe (NRW), Dr Tristan Hatton-Ellis (NRW) and Hannah Shaw (Freshwater Habitats Trust).

The purpose of the workshop was to discuss the existing Section 42 list of Species of Principle Importance for the Conservation of Biological Diversity in Wales and what are the key things to consider and do better if a new 'Priority' list is to be prepared for Section 7, to increase the chances of it achieving its aim/purpose.

Section 7, Biodiversity lists and duty to take steps to maintain and enhance biodiversity, of the Environment Bill (expected Spring 2016), requires that:

(1) The Welsh Ministers must prepare and publish a list of the living organisms and types of habitat which in their opinion are of principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales.

(2) Before publishing a list under this section the Welsh Ministers must consult the Natural Resources Body for Wales ("NRW") as to the living organisms or types of habitat to be included in the list."

Section 42 Freshwater habitats and species were the theme – why? Continuing to degrade but of high importance to biodiversity.

Dr Liz Howe gave a very useful and informative introduction to the workshop, particularly the background to the Section 42 list and Section 7 of the Environment Bill.

The questions posed to the group were:

1. What has s42 ever done for habitats and species in Wales and especially freshwater ones? And what hasn't it done.

What has your experience of s42 activity/awareness across Local Authorities and WG and other public bodies been like. Is there any way to improve awareness? Were the action plans a useful tool for guiding habitat action, research, monitoring?

2. Should we continue to base our Welsh priorities on the UKBAP list- does this still have a role to play- e.g. CBD reporting- will there be another UK report based on BAP lists?

Is there an alternative approach to producing lists of species, for example by looking at direct and immediate threat to existence using red list criteria and ignore other criteria such as other types of designation (EU, Sch5 etc), representation in Wales - would this work better?

Or, should the criteria we choose for selecting species be the same for all taxonomic groups, or for all habitats that they live in or not? Should we only choose species that are easily identified, or iconic/ keystone species?

3. We are being asked to deliver a resilient and biodiverse environment in Wales: what do you understand by that and what activities would you expect to see in place for freshwater habitats and species in order to achieve that goal. Would it be different for other habitats and their species?

4. If the result is that we basically transposed the current s42 list to s7 would you want to see any amendments to the freshwater habitats and species- are there any gaps in the habitat types represented, do they allow the inclusion of the species that require biodiversity action.

Are the freshwater habitats recognised at the same level of detail as others?

Should we pay more attention to connectivity, habitat condition, site action?

What are the priority habitats and species in the freshwater world?

Points made at the workshop were:

Group1:

Q1.What has s42 ever done for habitats and species in Wales and especially freshwater ones? And what hasn't it done.

If a s42 species is not known from a site, there is no power to request surveys for s42 species, whilst of course s42 habitats are more often recognised and taken into account. However, with rapidly declining species such as curlew, surveys in relation to wind turbine developments have been requested where the habitat is potentially suitable. Do people recognise habitats as being of greater biodiversity value? Or is it that surveying for some of the more common s42 species (for example hedgehogs) would be unreasonable and often a population of a s42 species on site would not be considered capable of a material consideration. Though requesting surveys for s42 species in areas where they are particularly rare may be considered reasonable. Could the list be interpreted by each local authority as required to fit it to the local conditions?

(Have freshwater habitats and species improved since s42 or are they continuing to decline?)

What has your experience of s42 activity/awareness across Local Authorities and WG and other public bodies been like?

The s42 list only seems to be relevant to and within the consciousness of people within planning departments. Public awareness of s42 (and BAP) is poor.

In certain circumstances, where the policies exist, s42 has broadened the species and habitats that have a reasonable consideration in development cases. S42 has not necessarily led to protection and enhancement nor to monitoring post development (but neither has legislation, particularly for small rural developments).

S42 list has raised the consciousness of recorders about the importance of these species. There is concern that there has been a loss of important habitats/mosaics/species because they are not on the list. Can we get examples of these?

Is there any way to improve awareness?

All departments should be made aware of their Biodiversity Duty and S42 lists, including architects, engineers, ground maintenance teams, sustainability, education, etc. This should have been the role of the Biodiversity Champions but they need to be 'special' people who really get why we are trying to conserve and restore biodiversity and be able to inspire the local authorities.

Q2. Should we continue to base our Welsh priorities on the UKBAP list- does this still have a role to play- e.g. CBD reporting- will there be another UK report based on BAP lists?

Is there an alternative approach to producing lists of species, for example by looking at direct and immediate threat to existence using red list criteria and ignore other criteria such as other types of designation (EU, Sch5 etc), representation in Wales - would this work better?

We could have ecosystem/mosaic habitats along with keystone species/habitats with descriptive factors. These could feed directly into LBAPs, planning and operations, etc. Species that are already protected by law should be removed. There should be more consistency between taxa (does this mean total numbers, relative numbers?). There should be a recognition that habitats are protected for the species they hold (or could support). Could include more species assemblages – would this indicate the habitat status as a s42 habitat? The list is too long!

Group 2:

Q1.What has s42 ever done for habitats and species in Wales and especially freshwater ones? And what hasn't it done. What has your experience of s42 activity/awareness across Local Authorities and WG and other public bodies been like?

Champions in Local Authorities have not been very effective on the whole.

The guidance has been really useful for species and habitats but Biodiversity Champions have not really 'championed' biodiversity in their counties.

The Guidance that WG produced was really useful to explain the importance of species and habitats and the NERC Duty, however, it wasn't followed up and there was no checking or enforcement- needed a bigger stick. Hopefully the WFG Act will solve this.

Were the action plans a useful tool for guiding habitat action, research and monitoring?

Yes! if you are a grant led organisation as it gives something to bid against.

Biodiversity Action Plans have been really useful tools in helping to get funding for projects to research and undertake habitat creation and management for S42 species – so we know a lot more about the status of s42 species. BAPS are also useful for informing planning conditions, where appropriate.

Q2. Should we continue to base our Welsh priorities on the UKBAP list- does this still have a role to play- e.g. CBD reporting- will there be another UK report based on BAP lists?

Is there an alternative approach to producing lists of species, for example by looking at direct and immediate threat to existence using red list criteria and ignore other criteria such as other types of designation (EU, Sch5 etc), representation in Wales - would this work better?

A categorised banded approach may help - look at rare but not threatened species. It would be useful to have prioritised actions actually on the list. UKBAP is no longer relevant not used for UK indicators for instance. Should start with s42 next time. Other sorts of drivers should also be looked at, not just rarity- e.g. does it need research? Do we know what management a species likes? Do we know it's ecology? Could there be a priority research list? Perhaps there could be different criteria for different taxonomic groups which might relate more to ecological needs/life cycles. Consider needs and actions that need to be taken into account. Could also help with the differing levels of knowledge about species.

Suggest s42 is directly transposed to s7 for immediate use- allowing continued protection, and then reviewed afterwards.

Group 3:

Q4. If the result is that we basically transposed the current s42 list to s7 would you want to see any amendments to the freshwater habitats and species- are there any gaps in the habitat types represented, do they allow the inclusion of the species that require biodiversity action.

We should look at additional species to add to the list with reasoning and also look to remove species with reasoning too, i.e. why are species on the list? – needs to be properly justified. Does the list need to be as long?

We should review current status and threats to s42 list and see if anything can come off or if there are any declining species that can be added. Buglife's Invertebrate Strategy could help to inform the list.

Habitat is more important than a single species but beware a broad approach to management as some many rare species have specific requirements. Should justify why each species is listed, its current threats and apply local criteria for Wales.

Should apply broad selection criteria and a multi- level approach. For example, plants could have two lists: one for rare species and one for common species which are declining, e.g. the harebell is common and widespread but it is declining in abundance. There is a general lack of data on abundance and distribution for some species groups, including species which are widespread and common.

Should we pay more attention to connectivity, habitat condition, and site action?

Connectivity is needed in some cases to increase resilience, but not all. The existing habitat conditions and species they support need to be considered fully before increasing connectivity because whilst in the majority of cases it will be beneficial, there are examples where connectivity could lead to biodiversity loss, e.g. White-clawed crayfish and signal crayfish and also red squirrels and greys. Lots of freshwater insects can fly and colonise nearby sites. Some species are spread by birds so range of dispersal is determined by length of digestion (the length of Wales for larger waterfowl).