Connectivity Approaches in Practice Workshop Session

1. Within your group discuss the various approaches to modelling and measuring connectivity you are familiar with.

2. Discuss the pros and cons of the various approaches for:

    a. planning where to focus habitat management effort
    b. monitoring connectivity and how it changes over time
    c. monitoring and evaluating project delivery

3. Identify your **3 top points** and **3 potential actions** needed now to drive this forward in the future

Group A

1. **Approaches to modelling and measuring connectivity**

- Not familiar with approaches
- B&BC NIA – used flora data to ID axiophyte hotspots and ID where gaps and blockages – gap analysis
- Urban areas –is a different approach required? At a different scale to rural areas. 'Cycling' of land more appropriate early phase/stage successional habitats
    - Opportunities for restoration and creation are more limited?
    - Often smaller scale opportunities
    - Need to link opportunities to development schemes
- Urban areas – connectivity of people to their landscape need to be recognised in modelling. Can look at change in ecosystem services delivery
- Can't change land use in urban areas in same way as rural areas; but can use planning system to influence beneficial land use change.

2. **Pros and cons**

- Urban areas require a different approach
- Using actual data to monitor change as a result of interventions PRO for approach adopted in B&BC NIA using axiophyta data for example
- BUT this approach is labour intensive eg before and after site surveys CON to map changes in axiophytes

3. **Top point**

- Existing models don't model urban areas as effectively/ robustly as rural areas. Different approach/ modified approach for urban areas.

Potential actions

- Develop an adapted model for urban areas
- Make use of planning system/GI strategies to influence beneficial land use changes, improve quality of existing open spaces

Group B

1. **Approaches to modelling and measuring connectivity**

Models – computational?

- Conceptual framework?

COMPUTATIONAL ---------- CONCEPTUAL

In between

- ZONATION Axiophytes

- Expertise required

BBCNIA
ID Eco Network

Partners and approaches in fens
Least-cost path
Condatis and others
Nearest neighbour?
UEA and Ditch network
Eco network and enhancement

Aggregation of activity
Demonstrate change
M&Ms

Rob off – Biodiversity Audit Approach –

2. **Pros and cons**

	Focus habitat man/creation	Connectivity and change	Project delivery
Zonation Least cost path	+ve decision makers +ve visual output -ve autecology	+ve numbers -ve how real	+ve decision makers +ve visual output
MONAD axiophytes/grid	++ planning and targeting		++ planning
Bio audit	++ quality and amount of species	Not as linked - Species monitoring Taxa	- Data requirement ++covers LOADS of species

3. **Top points**
   - Underlying data is important
   - Tension between computational methods and mapping led approaches. A combination of approaches may be important
   - Having a visual product is useful for communication and planning

   Potential actions
   - Data quality and understanding interpretation constraints
   - Complete Phase 1 digitisation nationally and national data
   - Academic partnerships are important – linking to expertise

Group C

1. **Approaches to modelling and measuring connectivity**

   - Planning where to focus habitat management effort
   - Species and climate change
   - Easy wins
     - land owners on board
     - Data records – data gaps
     - Where species persist already
     - Habitat records – undesignated areas vs designated areas

   - Approach
     - small scale habitat management
     - large scale management changes
     - trade offs
       - priorities
       - objectives

Monitoring connectivity and changes over time

- Linked to approach – small scale/long term changes
- Dissemination eg unis
- Standardise data collection
- Up to date records
- Partners – cross border species migration
- Citizen science
    - Raising public awareness
    - Local recorders
    - Apps – mammal tracker/ plant tracker

Monitoring and evaluating project delivery

- Scale of analysis
    - Small scale more achievable
    - Practicality of large scale
- Measure +ve change in quality?
- Long tem
- Project objectives
    - Achievable, deliverable outputs
- Government policy
    - Doing less better
- Priority mapping
    - Planning
    - Engaging partners

Habitat and species data

- engaging recorders/
- Citizen science
- partnership working – submitting data

Focus objectives and approach

- standardised approach
    - small scale
    - landscape scale changes
    - NIA national pilot – use evidence
        - Communicating between
- How to measure change in quality
    - Indicators
    - Standardise approach
- Longevity – government policy and commitment
    - Funding ☹ commercial sponsorship
    - Continuity
    - Shared values

Group D

- GIS mapping
  Identifying gaps (extent, quality, including restoration targets)
  Drawing on priority habitat datasets
    - National but ground truthing with partners/ local knowledge – 200 metre buffer zone to prioritise land adjacent to transport corridors
        - Looking at multiple benefits
        - Phase 1 exercise but how realistic to replicate it

1. Detailed baseline needs to be repeatable but may vary including standardised GIS
   Proximity of high quality habitats - due to time constraints and …
   …lack of resources

2. Difficulty of monitoring migratory birds plus costs
   Predictions and climate change
   Long term implications and what we need to prepare

3. Expense of having a good baseline and finding funding/resourcing it long term
   - Basic is better than nothing
   - Some indicator species eg butterflies can be used to show condition for other wildlife
   - We don't measure the functioning of other habitats created/restored etc

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1. Use models to help understanding but first step
2. More money – better investment
3. Understanding better how habitats function – does it work and are they ecologically connected

Summary

- Drawing on priority habitat data sets, but ground-truthing with local knowledge and expertise.
- Having a good baseline such as phase 1
- Ensuring approaches are realistic and achievable
- Difficulties in monitoring, e.g. some species may have a national (or wider) range and very hard to monitor locally
- Long-term modelling / monitoring difficult, e.g. due to climate change impacts
- Funding and resources are an issue
- Possible use of indicator species to understand underlying habitats
- Using models is a good first step, but needs to be taken further
- More investment from government would be good!
- Need a better understanding of how habitats actually function

Group E

1. **Approaches to modelling and measuring connectivity**
   - Network circuit theory (eg condatis), circuitscape
   - Least-cost modelling approach (potentially refinable by Condatis)
   - Expert opinion-led decision tree approach (leading to GIS outputs) eg Nene Valley
   - Species vs habitat connectivity
   - Blends of approaches – models validated by local communities and experts?

2. **Pros and cons**
   - Availibility (cost!) and quality of data is crucial to tech. modelling approaches
   - Resolution of data – patch size can be less than yr mill. Pixel size
   - Getting buy-in from local communities – use local knowledge to feed in or at least validate outputs of computer models
   - Still need to ground truth data going into a model – time and money

- Timescales for monitoring change (decades)
- Community buy in is important at some stage – computer models alone may not lend themselves to this
- How you present your data is as important as how you construct it eg 3D photo montage rather than 2D map
- Data quality imposes it's own contstraints in terms of £, time, choice of approach

Potential actions

- Can we have a single evaluation of all these different models so practitioners can 'shop' for the best approach according to their local circumstances?
- How do we get better at capturing real world data produced by processes like countryside stewardship and T&CP decisions. This data is all being lost at the moment.

Summary

- Data quality a major issue
- What is the end product? Community buy-in is important, and modelling alone will not help get buy-in e.g. from farming community
- How data is presented is as important as how good it is – need to draw on different disciplines
- Actions:
  - Need a single approach to monitoring;
  - How to get better at capturing all the data coming from other processes (e.g. countryside stewardship etc);
  - All the case studies that seem to exist – it would be really good to have a 1-stop-shop for all these approaches and data etc. for people to draw on and learn from

Group F

3 top points

- Good quality accurate survey material
- A good modelling system may give accurate ideas for locations to look for opportunities or places to concentrate resources
- Familiarity with the modelling system so it's consistent, sustainable and has longevity

3 top actions

- Continuing to collect data to inform the model
- Piloting the model in different landscapes
- Training and communicating how to use the model

Group G

MAP----------scale----------MODEL

Knowledge of local area — technical, costly
In start of bid — save for later
Which species/ what to model how to decide on priorities
Restricted to land under NIA influence
Could have critical but human prob pinch point
Target people to get access to land

- Modelling relies on data, and the model will only be as good as the data that goes in
- What tools to go to for reliable advise and not vested interest
  dory model direction test and prove
- Models
  Data bases
  Barrier – not all free, some restrictions
  Could direct bid plan invest in modelling access to data – less arguing who's species is most important
  Barrier – technical skills required and using databases

Outcome

- How do you know species will actually move
- Still need to take action precautionary principle or it will be too late
- Monitor – experts, volunteers and what they want to do
- TIME LAGS
- What is minimal action to enable more national movement – may not need model just a little time
- NEED BIG LONG TERM EXPS

1) More complex models are more reliant on detailed data
2) LCM poor scale for small bits of habitat/patches
3) BAP habitat not 'ecol' micro hab aware – how to model this level or guess map it

a) Level of detail you need to pitch your model!
   Who owns the land is the biggest decider of where you can act
   Dealing with land managers is critical with some it can take decades to get permission to get on their land
   At detail the land cover map is too course
b) It is often very specific factors within a habitat that will enhance or limit connectivity whereas a model will show great connectivity
   Need large scale and long terms exps – 3 years (NIAs) is no good
c) Only have 3 years funding - could spend a lot of that on modelling or data collection to feed the model
   Need the data before you can plan or bid for new funds
   Skills for databases and modelling is often limited within delivery projects

Summary

- Lot of people using mapping – drawing lines around things, filling in gaps
- Other people using complex modelling of species and habitats
- Question of how to decide on priorities
- Modelling relies on data, and the model will only be as good as the data that goes in
- Language and skill barriers – e.g. between experts creating models, and landmanagers / owners

- Landcover mapping – level of scaling is important for some types of species (e.g. butterflys)
- How do you know species are responding in way expected? How to monitor…
    - Monitoring may be a bit hit and miss depending on levels of interest (survey effort)
    - Need longer term monitoring of different approaches and species