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Regional Accession Network **ECRAN**

Management Planning for Natura 2000 sites

- **Background to Natura 2000 in Scotland**
- **General Requirements for Management Planning for Natura 2000**
 - **Some case studies**

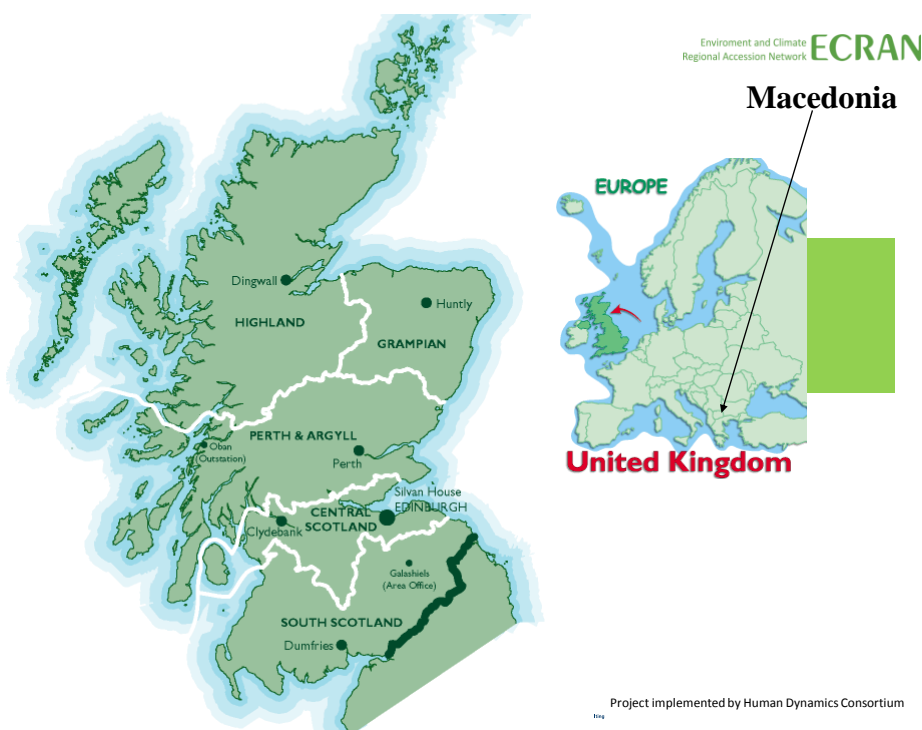
Syd House
Forestry Commission Scotland
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Current issues in Scotland


- Politics – Less money for public services?
Independence? In/out EU?
- Developing land use strategy to optimise multiple benefits (including lost species re-introduction)
- Land reform to encourage greater spread of ownership & community involvement in land use decisions
- Changing rural economy & rural incentives
- Key Government commitment to have Natura 2000 sites in Favourable Conservation Status



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Scotland & Natura 2000

- Sites & species identified are protected under EU Law by the Habitats (Special Areas of Conservation) & Birds (Special Protection Areas) Directives
- Natura 2000 is the EU network nature conservation sites protecting key important habitats & species across Europe
- EU Law transposed into Scots Law to give legal status
- Key habitats across Scotland are marine and associated species, peat bogs and open moorland, raptors, & migratory birds + some woodland
- Many threats to habitats
- Most sites in private ownership
- Management Plans are key to this

Influences on conservation management

- Scotland's (and European?) landscapes, associated habitats and associated species (including Natura 2000 sites) are thus predominantly a **function of human intervention and management interacting with the natural environment** (eg Scotland is a largely **deforested** country)
- Management of Natura 2000 sites recognises that **many people earn a living from these sites**
- In these situations **designated conservation objectives** will often require **intervention and pro-active management** to retain that interest
- Managing for conservation (including Natura 2000) is not necessarily about managing conservation sites
- Balancing economic, social and economic objectives is common to all Natura 2000 sites and conservation-designated sites everywhere



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The need for management planning

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- A management plan is:
- ‘An easily understood set of principles in an accessible form, by which a defined area (small or large) may be managed’ *to achieve stated objectives*
- ‘Management Planning for Protected Areas: a guide for practitioners and their bosses’ Idle & Baines 2005

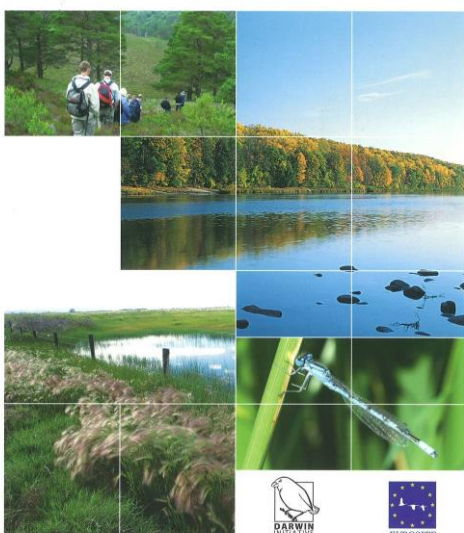


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Management Planning for Protected Areas a guide for practitioners and their bosses



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‘State forestry developed Management Plans as a way of bringing order to the business of long-term forest management, from planting through to harvest

These forest plans became the basis of the early Management Plans adapted for use in Protected “nature” Areas.

Management Plans – the essentials

- What are the assets and why are they important?
- What are the objectives of management & desired outcomes?
- Who are the key stakeholders with an interest in the Plan and have they been involved in drafting the Plan?
- Who is responsible for drafting the Plan & then delivering it?
- Who will monitor progress and amend as necessary?
- Who will judge success and/or failure and how will they recognise it?



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Summary Box 1

Q. Why have Management Plans?

A management plan will be useful because:

A. It clarifies thinking & priorities!

- 1. Legislation** It meets the needs of legislation. (In some countries Management Plans for Protected Areas are a specific legal requirement e.g. Nature Reserves, National Parks or Habitats Directive (Natura 2000) sites.)
- 2. Objectives** It makes clear the role and objectives of the Protected Area e.g. in meeting a range of targets such as national biodiversity & sustainable use targets.
- 3. Condition** It identifies what needs to be done to maintain "Necessary Conservation Measures". (European Habitats Directive; Natura 2000).
- 4. Practical tool** It is a practical tool for Protected Area managers & staff:
 - planning work
 - priority/target setting
 - resource allocation (staff, time & money)
- 5. Consistency** It provides for consistency and continuity for the managing organisation.
- 6. Rationale** It informs future managers of what was done and why.
- 7. Understanding** The people involved in management can understand the reasons for the work they are doing.
- 8. Credibility** It gives credibility, (particularly political credibility), to the objectives and management activities at all levels within the Protected Area.
- 9. Communication** The preparation process is a means of communication with "Stakeholders" and securing their support and involvement in the Protected Area.
- 10. Progress** It identifies what data and information is needed for evaluating progress, towards the objectives through monitoring and recording.

Summary Box 2

When should you prepare a management plan?:

1. **New site** When a new Protected Area has been acquired or designated.
2. **Extension** When a significant extension has been added to an existing Protected Area.
3. **Renewal** Following a 5-year to 10-year review of an existing Management Plan.
4. **Re-orientation** Following clear assessment of the need for a change in objectives or management of a Protected Area or its ecosystems.

Summary Box 3

The management plan will be used by:

1. The Protected Area managers and their "parent" organisations.
2. Resource planners who allocate finances and staff.
3. Scientists who are responsible for monitoring and recording.
4. "Stakeholders" who live in and/or use the Protected Area e.g. farmers, foresters, recreation, visitors.
5. Politicians with responsibility for or interest in national and local biodiversity goals, including designated sites.



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Summary Box 4

Ten key competencies required for preparing plans:

1. Knowledge of the Protected Area & its resources.
2. Scientific understanding of ecosystem function related to the area to be managed.
3. An ability to prepare costed plans.
4. Ability to communicate effectively (both in writing and orally); effective information managers
5. Negotiating/advocacy & managing relationships skills.
6. Political sensitivity & an ability to build rapport; good listening skills.
7. Flexibility/tolerance; willingness to recognise changing circumstances & deal appropriately with them.
8. Realistic & able to achieve the possible.
9. Understanding & use of project management skills.
10. Local background and credibility.



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An example of a Management Plan from woodland sites in Scotland

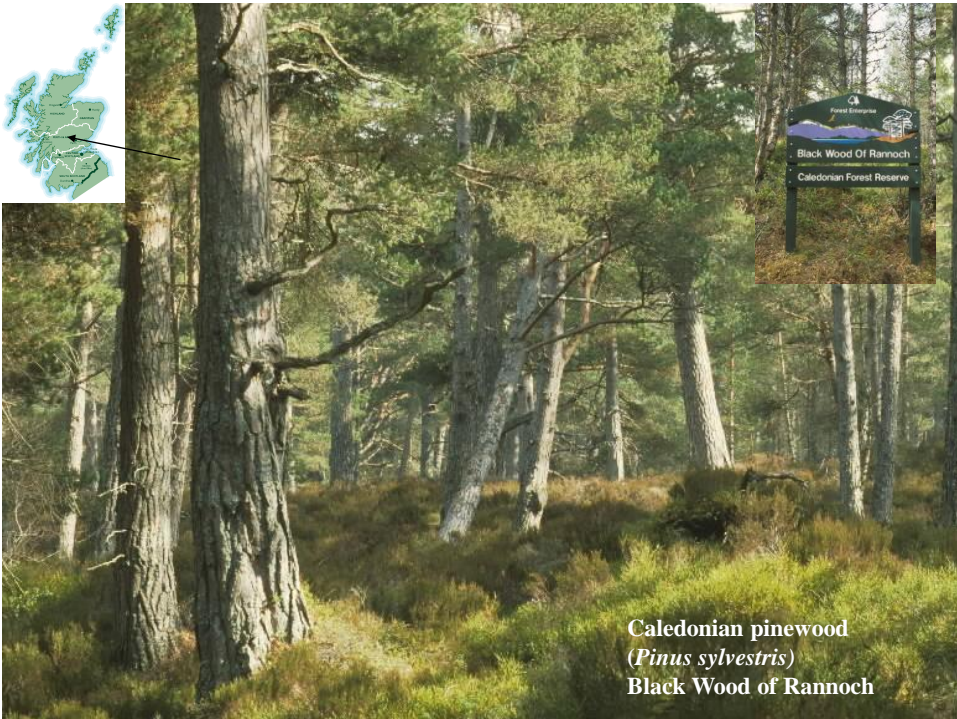
The Black Wood of Rannoch is now a designated SAC under the EC Habitats Directive (SAC EU code UK0012758). The Black Wood has been selected as a SAC because it comprises Caledonian Forest, a habitat endangered on a European basis. This habitat "supports a ground layer of heath species, mosses and liverworts and often contains a range of distinctive lichens, flowering plants, invertebrates and bird communities".



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**Caledonian pinewood
(*Pinus sylvestris*)
Black Wood of Rannoch**



Management Objectives

The primary objective will be to maintain and enhance the historic, landscape and Scientific interest of the Black Wood as a semi-natural Caledonian pinewood with its associated fauna and flora, while perpetuating the genetic purity of the local Rannoch pine.

There are also a number of **supporting objectives**:

- Timber production but only where this is compatible with conservation objectives
- The Black Wood will also be used for study and research
- Public access & enjoyment: As part of an open access policy, the public will be welcome to use the tracks within the Reserve on an informal basis, providing this is compatible with the other objectives.



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Key contents of the Management Plan

- Description (Physical/biological/cultural) **3 pages**
 - Status (Designations) **3**
 - Management (Aims/objectives/monitoring) **4**
 - Bibliography **6**
 - Appendices **12**
- *NB Management Plans are best kept short otherwise no-one reads them! Put only key information & management aims in the Plan with all other background description, analysis etc in Appendices*



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Long term Management Aim

The long-term objective over the next 100 years will be to have a semi-natural pinewood ecosystem flourishing across the whole of the Caledonian Forest Reserve.

Within the Reserve there are likely to be two broad zones.

• **Conservation zone (649ha) - relatively undisturbed development of the native pinewood ecosystem. Minimal other management intervention is foreseen.**

• **Restoration zone (269ha) - restoration of all elements of the native pinewood ecosystem including promotion of natural regeneration, if required. Active intervention to remove non-native trees & regeneration**

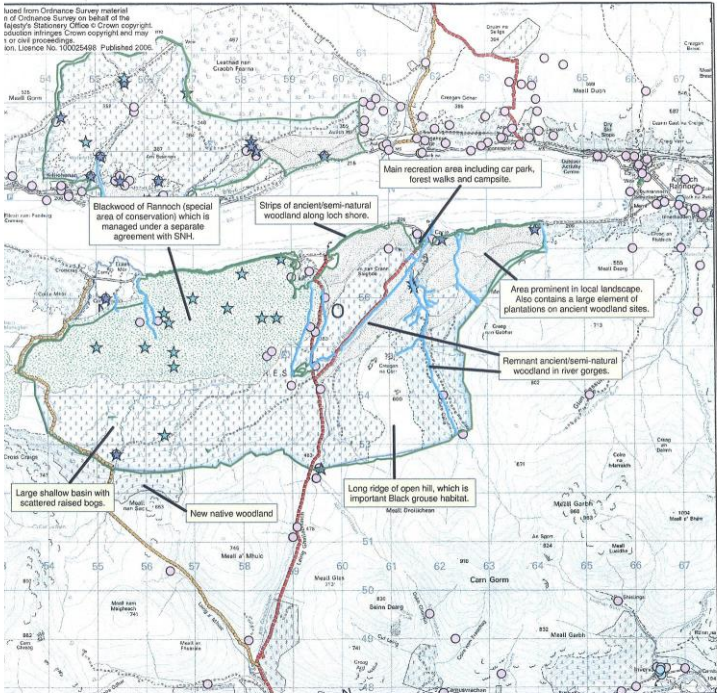
Zoning is a very useful tool for reconciling multiple objectives



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Appendix 2

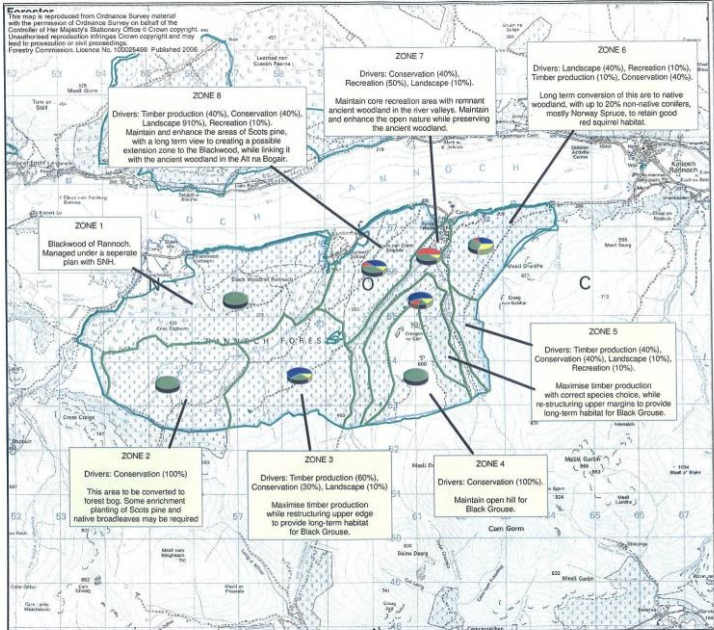
Tay Forest District
South Rannoch Forest

Key Features

- Legend
- watersupply
 - Management Area
 - Conservation
 - Research
 - Unscheduled AM
 - archaeology
 - Ancient Monument (S)
 - Ancient Monument (U)
 - Unknown
 - row
 - FEATDESC
 - Assessed
 - Claimed
 - Caledonian Pinewood
 - ancient woodland in district
 - Ancient (of semi-natural origin)
 - Long Established (of plantation origin)
 - Other (on Roy map)

Date: 2/3/07
Drawn by: HM
Scale: 1:50000

Forestry Commission
Scotland
Tay Forest District 01550 727284
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Forestry Commission, GD 272388, 2001.



Appendix 4

Tay Forest District
South Rannoch Forest

Strategic Management
Objectives

- Legend
- management objectives split
 - TIMBER
 - RECREATION
 - CONSERVATION
 - LANDSCAPE
 - Management Area

Date: 2/3/07
Drawn by: HM
Scale: 1:50000

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Stakeholder Involvement

This information was circulated to the following people on 7th September 2005 as well being addressed at 2 community meetings 7th September 2005 on 7th April 2006:

Consultee	Interest
Mr Andrew Barbour, Bonskeid Estate	Forest Panel/Neighbour
Mr John Burrow, SNH	Forest Panel
Mr Gerrard Wilson RSPB	Forest Panel
Mr Bob Fryer, SWT	Forest Panel
Mr Bruce Gloak, SEPA	Forest Panel
Mr Victor Clements Scottish Native Woodlands.	Forest Panel
Mr Willie Millar Community Council	Community Council
Mr Mike Whitehead, ramblers Association	Forest Panel
Mrs Hazel MacLean and Mr Mike Strachan Forestry Commission	Forest Panel
Mr Archie Boyd	Chair LRCA
Mr Richard Legate	Neighbour
Mr Colin Johnstone	Neighbour
Mr David Friskney	Neighbour
Mr Adrian Hawker	Neighbour
Mr Richard Paul	Neighbour
Helen Au	Neighbour
Mr and Mrs A Cunningham	Neighbour
Mrs Morag Shelton	Neighbour
Mr and Mrs Monkton	Neighbours



Case studies



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Loch Leven Catchment: A case study in collaboration to manage a Special Protection Area

Natura 2000 Habitat Directives

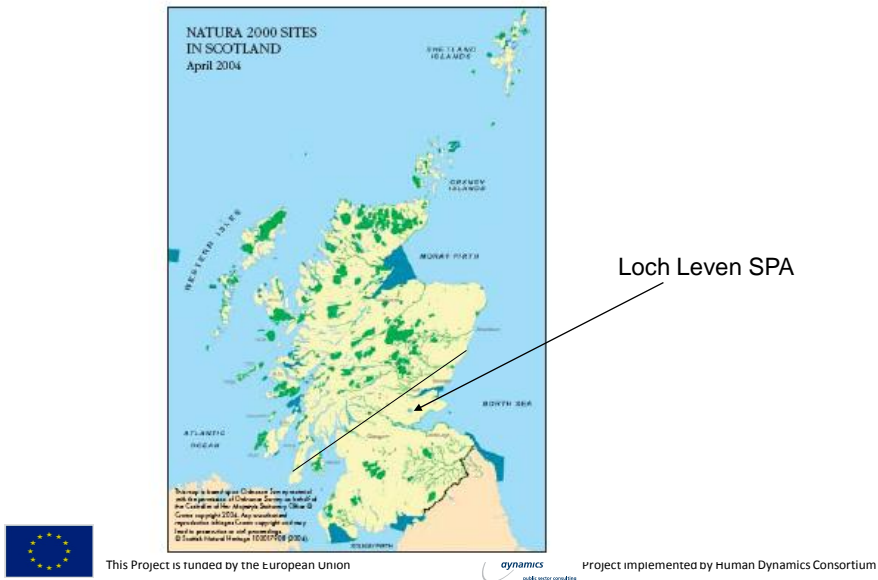


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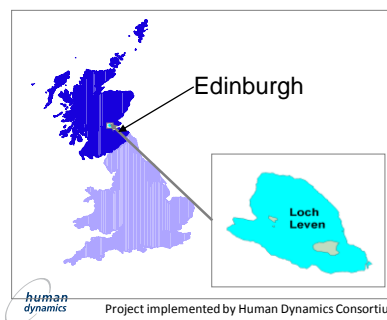
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How SACs and SPAs have been selected



Overview of Loch Leven

- A shallow lake ~1400ha
- Surrounded by farmland
- Polluted by runoff and effluent discharges
- Home of a famous trout fishery
- High conservation value ie SPA for geese
- Supplies water to industry



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Table 1 Designations and qualifying features for Loch Leven NNR

Feature description	Common name	Scientific name	Natura 2000 (SPA)	Ramsar	SSSI
Birds					
Supports over 20,000 wintering waterfowl			✓	✓	✓
Internationally important numbers of:					
	pink-footed goose	<i>Anser brachyrhynchus</i>	✓	✓	✓
Supports nationally important wintering populations of several other species of wildfowl:					
	shoveler	<i>Anas clypeata</i>	✓	✓	✓
	whooper swan	<i>Cygnus cygnus</i>	✓		✓
	cormorant	<i>Phalacrocorax carbo</i>	✓		✓
	gadwall	<i>Anas strepera</i>	✓		✓
	teal	<i>Anas crecca</i>	✓		✓
	pochard	<i>Aythya ferina</i>	✓		✓
	tufted duck	<i>Aythya fuligula</i>	✓		✓
	goldeneye	<i>Bucephala clangula</i>	✓		✓
	greylag goose	<i>Anser anser</i>			✓
Breeding bird assemblage					✓
Fen, marsh and swamp					
Wet unimproved pasture flanking the loch					✓
Invertebrates					
Rare beetles					✓
Rare flies					✓
Standing open water and canals					
Aquatic species representative of a eutrophic water body				✓	✓
Vascular plants					
Vascular plant assemblage, including the following species:					✓
	coral-root orchid	<i>Corallorhiza trifida</i>			
	Loch Leven spearwort	<i>Ranunculus flammula</i> x <i>repens</i>			
	lesser water plantain	<i>Baldellia ranunculoides</i>			
	holly grass	<i>Hierochloa odorata</i>			
	threadrush	<i>Juncus filiformis</i>			
	mudwort	<i>Limosella aquatica</i>			

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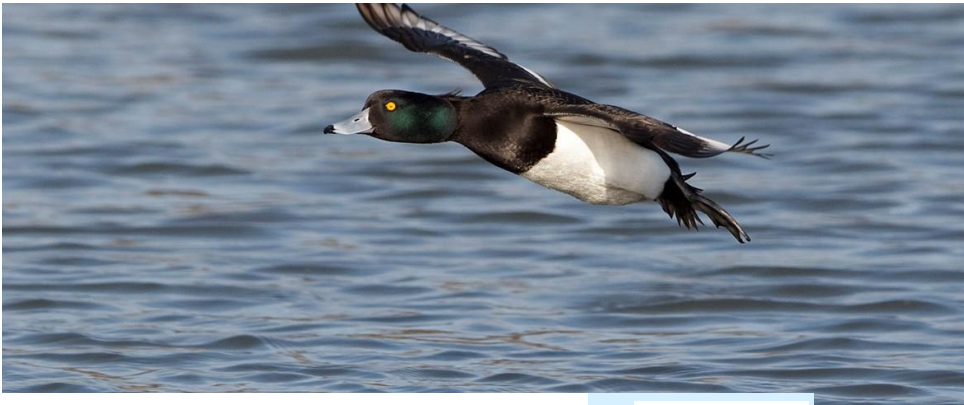


Whooper swan
Cygnus cygnus

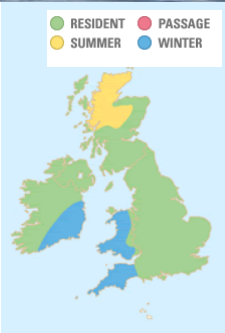
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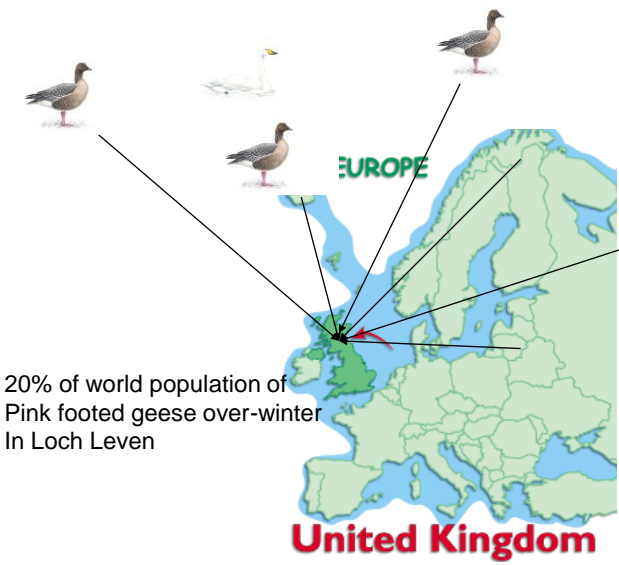
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Tufted duck
Aythya fuligula



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Natura conservation objectives for Loch Leven

Special Protection Area

To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and

To ensure for the qualifying species that the following are maintained in the long term:

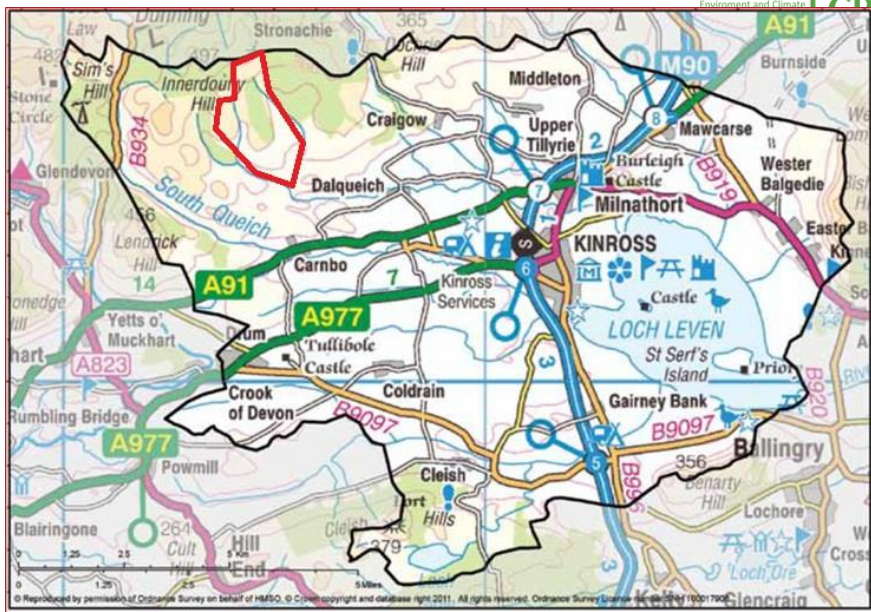
- population of the species as a viable component of the site;
- distribution of the species within site;
- distribution and extent of habitats supporting the species;
- structure, function and supporting processes of habitats supporting the species;
- no significant disturbance of the species.



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Important fishery

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Long history of study

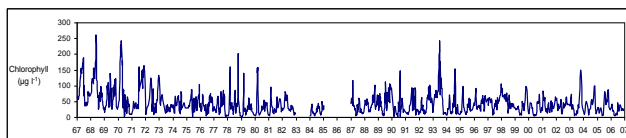
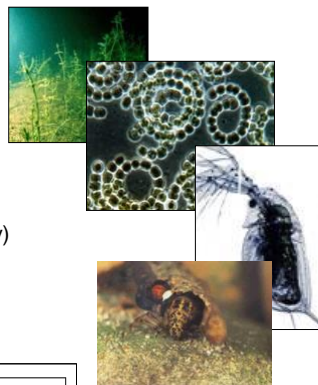
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Centre for Ecology & Hydrology

- 43 years of weekly/fortnightly data
- 500 in-lake physical, chemical and biological variables
- weekly nutrient loading data at 10-year intervals

Other sources

- loch level & outflow since 1850 (Tullis Russell)
- lake chemistry 1951 – 1979 (Freshwater Lab, Pitlochry)
- aquatic plants 1821 - 1999 (Various)
- fish catches since 1900 (Kinross Estates)
- birds since 1967 (SNH)



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Historic Problem with increasing eutrophication (nutrient enrichment)

- Point sources of Phosphorous (Outflow from local industries/woollen mill/sewage treatment works)
- Diffuse sources of P (Septic tanks from residential development; farm fields & animal sheds)
- Algal bloom in summer 1992 cost ~£1m Major impact on fishery & tourism(economic) + SPA interest (environmental) + local residents (social)



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Exceptional runoff overwhelmed buffer at 2



locations (BID 2011)

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Agricultural input also a problem



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Sediment & fertiliser run-off

One of 2 hotspots: break through of sediment



Very large area of exposed soil after lifting potato crop; field slopes down towards burn



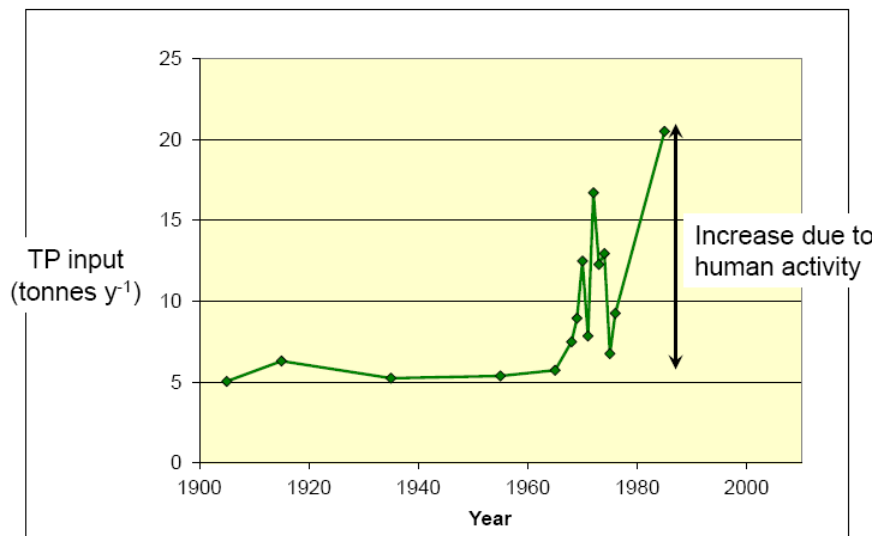
(BJD 2011)

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Historical perspective

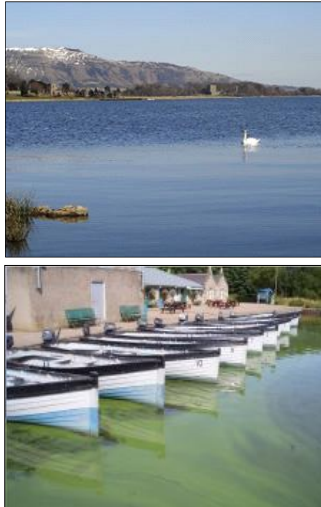


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Water quality problems Environment and Climate Regional Accession Network ECRAN



Cost of 'Scum Saturday' to local community ~ £1M in 1992



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Impact of algal blooms Environment and Climate Regional Accession Network ECRAN

Costs of algal bloom in 1992

- Trout fishery loses revenue **£110k**
- Local businesses lose income from tourism **£673k**
- Water treatment costs increase for downstream users **£160k**
- Negative effect on conservation status **£???k**

Total cost of 'scum Saturday' = £943k

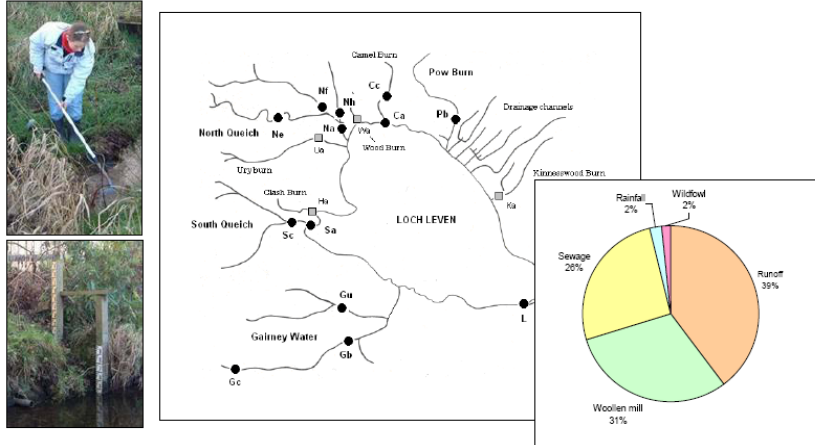


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Identifying Catchment Sources Environment and Climate Regional Accession Network ECRAN



P input measured every 8 days for 1 year



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Balancing conflicts of interest Environment and Climate Regional Accession Network ECRAN

Loch Leven has many uses.

Some need good water quality:

- Famous trout fishery
- Tourist attraction
- Nature reserve
- Water supply

Others degrade water quality:

- Sink for catchment drainage
- Effluent disposal
- Water supply

This causes conflicts of interest.



Management challenges based on past history

Attempts to improve ecosystem services at Loch Leven have included:

- [Hydrological modification](#) to improve water supply (1830)
- [Fish stocking](#) to improve fish catches (1883-2004)
- [Pollutant reduction](#) to improve water quality (1985-1995)

Focused on better delivery of one service, while ignoring the knock-on effects on others.

Overlooking the role of ecosystem function in determining ecosystem response has led to unexpected impacts and unintended consequences.

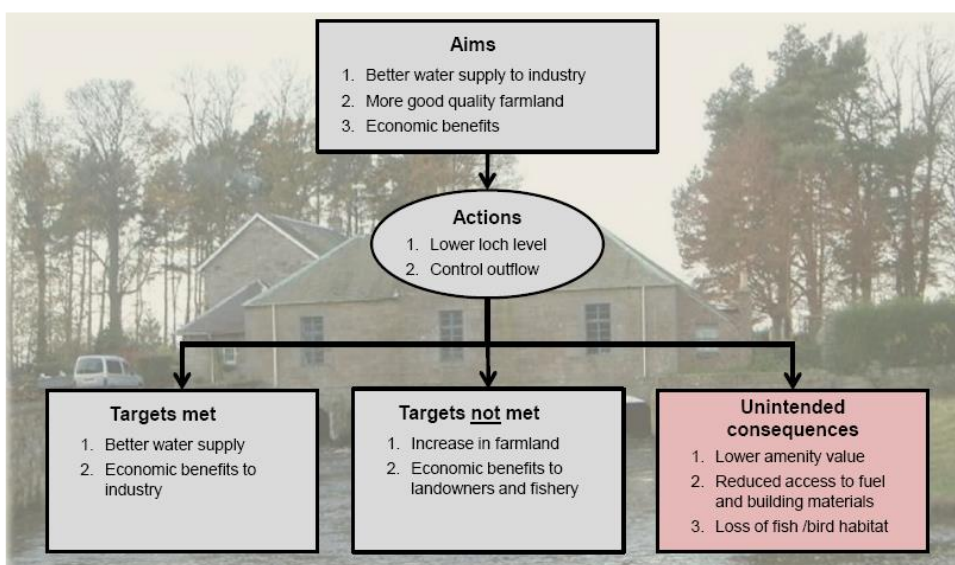


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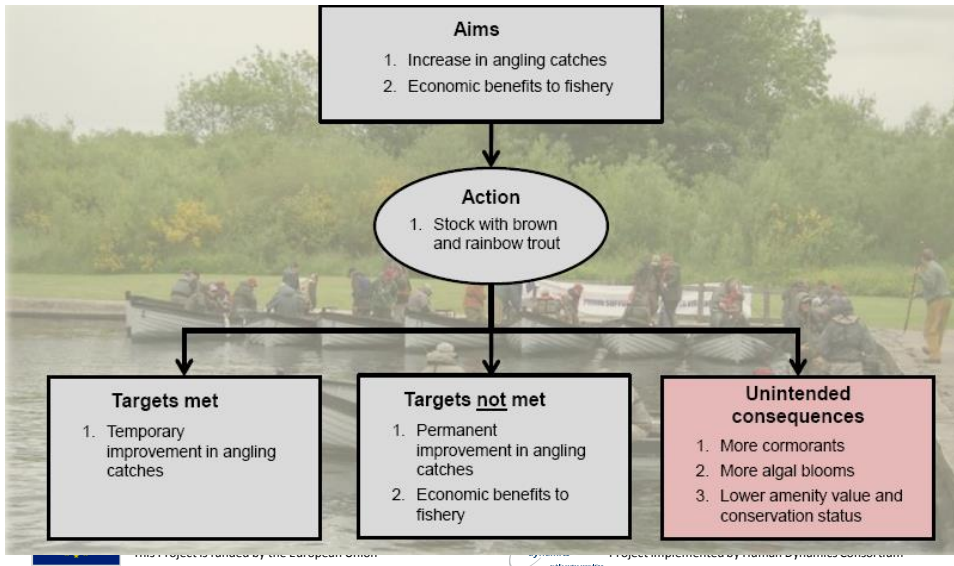
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Historic hydrological modification consequences



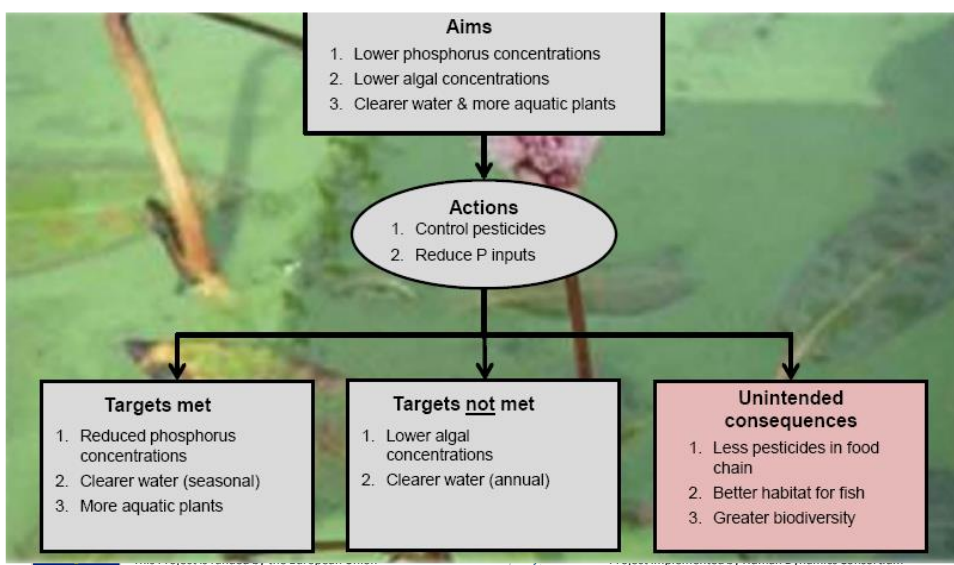
Increased fish stocking: consequences

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Impacts of pollutants reduction

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Conclusions

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- Management of aquatic ecosystems effectively is a major challenge.
- We need to set targets based on a good scientific understanding of structure and function
- Stakeholder involvement is important; we need to work together
- Without this, management intervention will continue to cause unintended consequences.
- Most of these are unwelcome.

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A Range of solutions required

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- Compliance
- Support/incentives to do the 'right thing'
- Collaboration by public bodies to work with all the other stakeholders
- All under the heading of Integrated Catchment Planning



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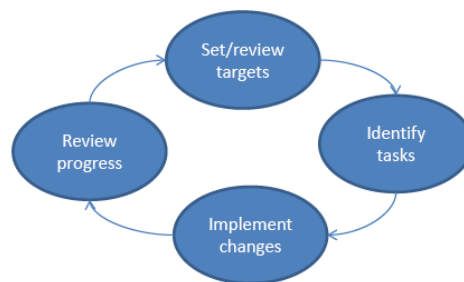
Developing a Plan Environment and Climate Regional Accession Network ECRAN

- Water quality WG
- River management WG
- Land use WG
 - Planning & development
 - Agriculture & forestry
- Timetable for implementation

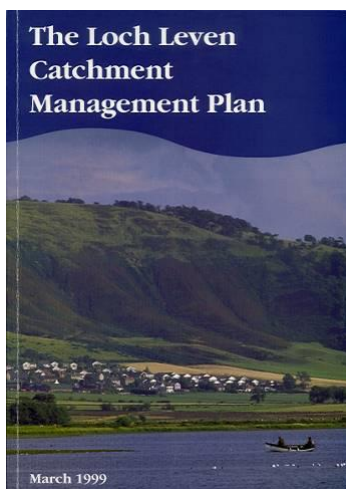


For each task identified:

- Appoint lead organisation
- Assign relative priority
- Specify targets & likely benefits
- Establish timescale for implementation
- Identify resources required



Setting restoration targets Environment and Climate Regional Accession Network ECRAN



Indicators	Target values
Annual mean P conc. (mg m ⁻³)	40
Annual mean chlorophyll conc. (mg m ⁻³)	15
Annual mean water clarity (m)	2.5
Max. macrophyte depth (m)	4.5



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Stakeholder involvement



And many others ...

Point sources

- Action to tackle problem started in 1970's
- Problems from point sources tackled first through existing regulatory means
- Sewage works improved & industry closed down (due to economic reasons)
- 70% reduction in P into to the loch

BUT

- Water quality did not recover sufficiently as diffuse sources still a significant problem



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Diffuse sources

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- 80% catchment is farming with much arable (potatoes/barley)
- Farm nutrient and sediment run-off specifically targeted
- New housing/development must meet stringent standards to ensure no negative impact on water quality
- Different approach – multi-organisation Catchment Management Planning



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North Queich: excellent livestock watering structures

Rolling topography favours this simple option:



Gravity feed from stream higher up, into open channel with entry **below** level of water channel



(BJD 2011)



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Hotspot solution 2: diverting runoff away from livestock holding area



BJD 2011

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**Sediment sump
below extensive
arable hill slopes,
protecting buffer
strip & burn**



Should this
technique
be replicated
elsewhere
in catchment?
(BJD 2011)



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Hotspot solution: recovered topsoil,
3.2.2011



(BJD 2011)



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BJD 2011



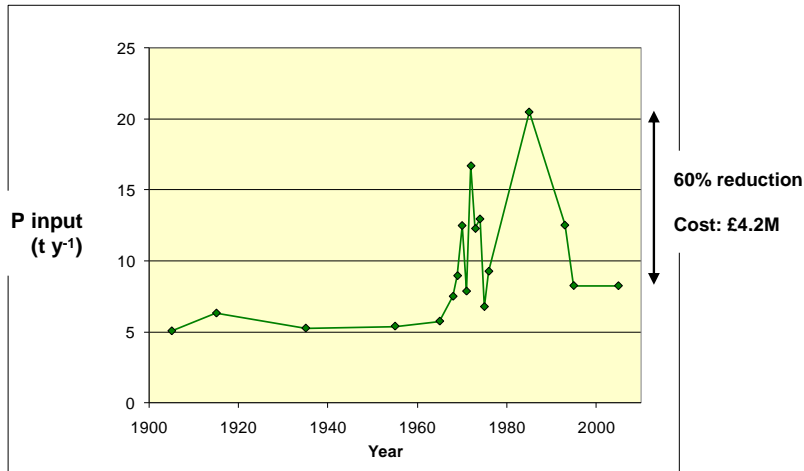
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Reduction in P inputs achieved so far

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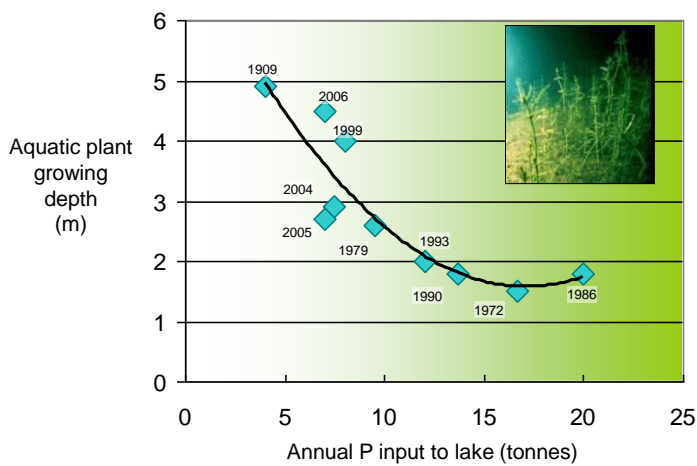


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May 4th, 2012

Aquatic plants in deeper water

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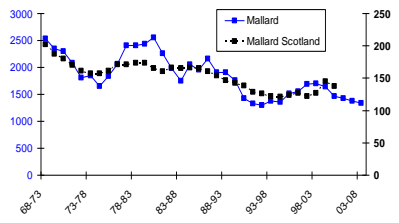
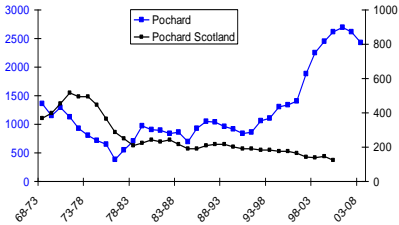
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May 4th, 2010

Improved habitat for wildlife

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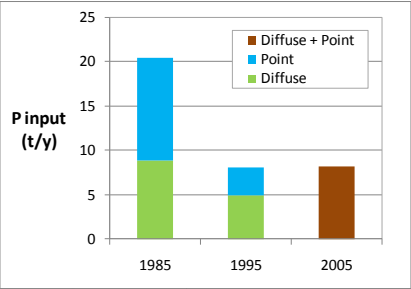
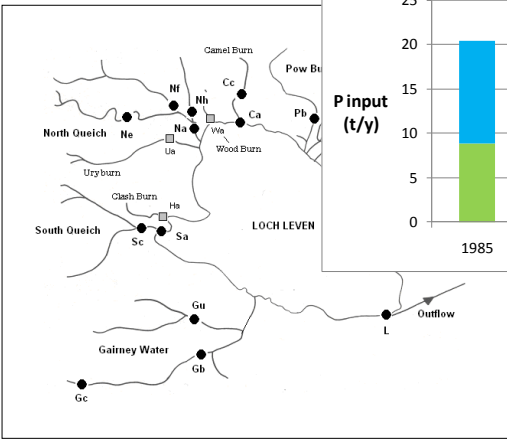
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October 2013

Next steps

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P input measured every 8 days for 1 year 1985, 1995, 2005 ... 2015?

(Silica & nitrogen inputs too)

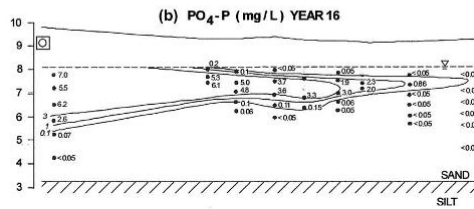
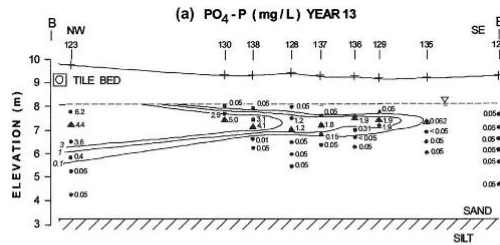
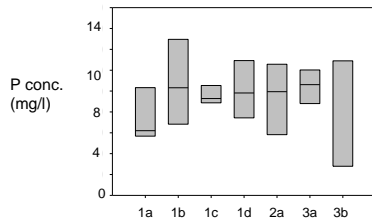
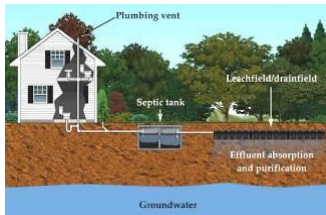


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Bailey-Watts & Kirk, 1997, 1999, Delev 2008;

Reduction of septic tank impacts



After Robertson et al (2008)

- (1) solid settling tank
- (2) solid settling plus aeration
- (3) solid settling plus aeration plus chemical treatment



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6 Tuesday, November 18, 2014

LOCAL NEWS

Beauty spot's gold star for green work

by Jamie Buchanan

A KINROSS-SHIRE beauty spot has been crowned Britain's best nature reserve. Loch Leven, which is run by bird welfare charity RSPB Scotland, has scooped the coveted Green Tourism Gold Star Award, beating competition from scores of other sites throughout the UK.

The reserve, on the edge of Kinross, was named as winner at the Green Tourism annual conference in Manchester. It was shortlisted as a finalist in the best reserve category alongside Farne in Abernethy and Wainey in Norfolk.

Karen Caldwell, visitor services manager at Loch Leven, said last night: "We were absolutely delighted to win. It's thanks to the hard work of the whole team, both staff and volunteers, helping us to be as sustainable and green as possible."

"It is at the heart of everything we do, from our core work providing homes for nature, to our energy use, to our café and our work with the local community."

The awards, which are in their fourth year, aim to honour businesses and organisations which have done the most to promote sustainability by implementing cost-saving practices that help the environment and improve customer service.

Judges were impressed with a variety of sustainability measures taken at Loch Leven, including the use of solar panels and a wind turbine to produce 20% of its own electricity.

It also scored points for not using fertilisers, stopping phosphates from waste water and sharing agricultural machinery and equipment as a member of a local network.

It is the second major award for the Loch Leven team. Earlier this year, staff were awarded a Gold Food For Life Catering Mark by the Soil Association in recognition of their ongoing drive to provide local, organic and home-made food.

Ms Caldwell added: "There's always more we can do to lessen our impact on the environment and make a difference. Tiny little changes can be as important as the big ones and we continue to look for ways to improve."

Andrea Nicholas, director of Green Tourism, said the organisations had been pioneering environmentalism, battling pollution and promoting conservation for 17 years: "In that time, we have helped more than 5,000 businesses improve their commitment to sustainability and we continue to expand both in the UK and abroad."

She added: "The Gold Star awards are a recognition of the best of the best in Britain when it comes to creating and maintaining a green, sustainable tourism industry."

The Loch Leven reserve was bought by the RSPB in 1967 with initial plans to create a hub for environmental education programmes. Staff and volunteers work with more than 250 schools each year and have introduced a new outdoor playground.

j.buchanan@rspb.co.uk



Views of the RSPB-operated Loch Leven nature reserve. Pictures: Andy Hay

Human Dynamics Consortium

An example of a proposed project which might impact on the SPA – Appropriate Assessment required

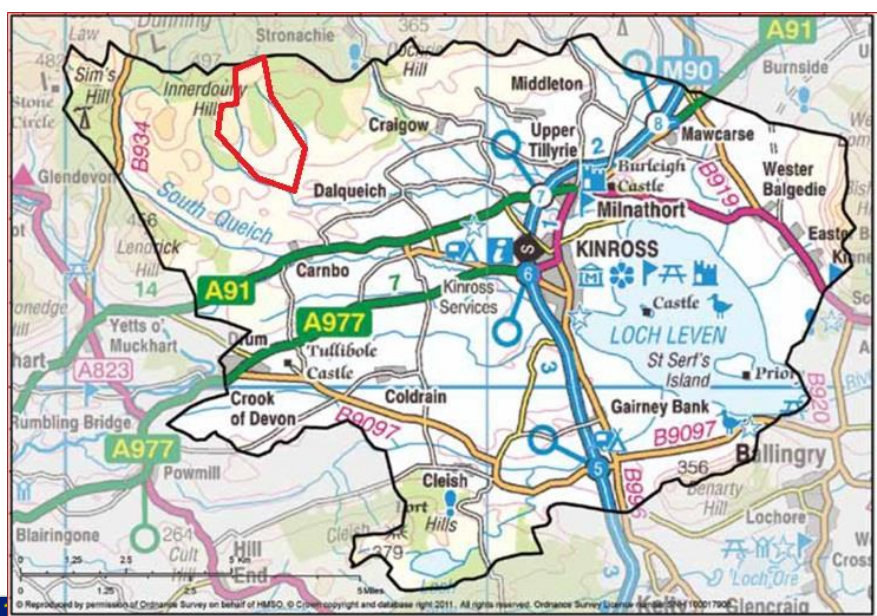
- Planting of 300ha of new woodland
- Felling & replanting of 50ha of woodland
- Forest road construction

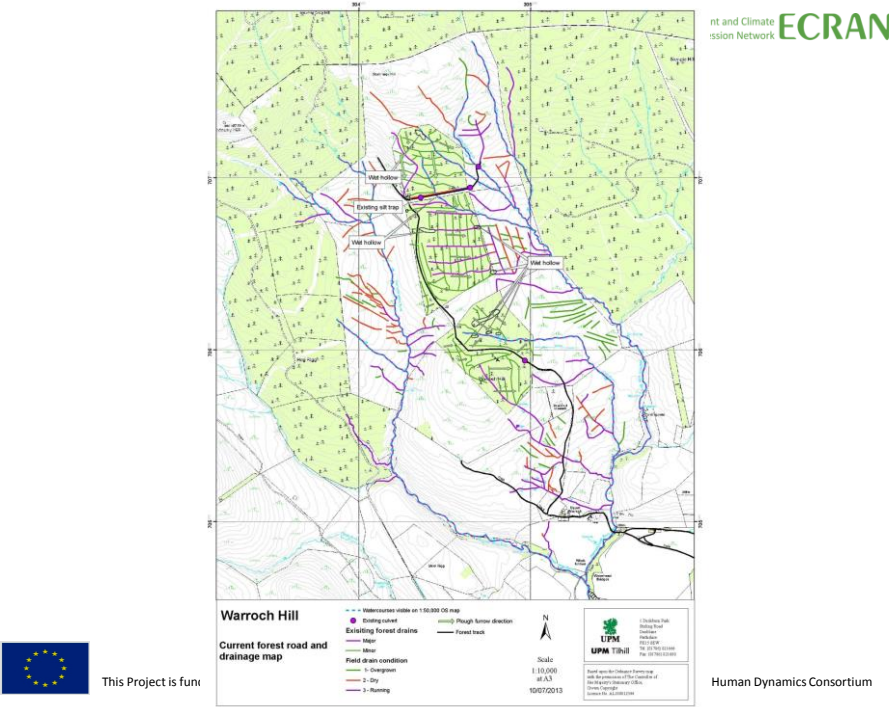


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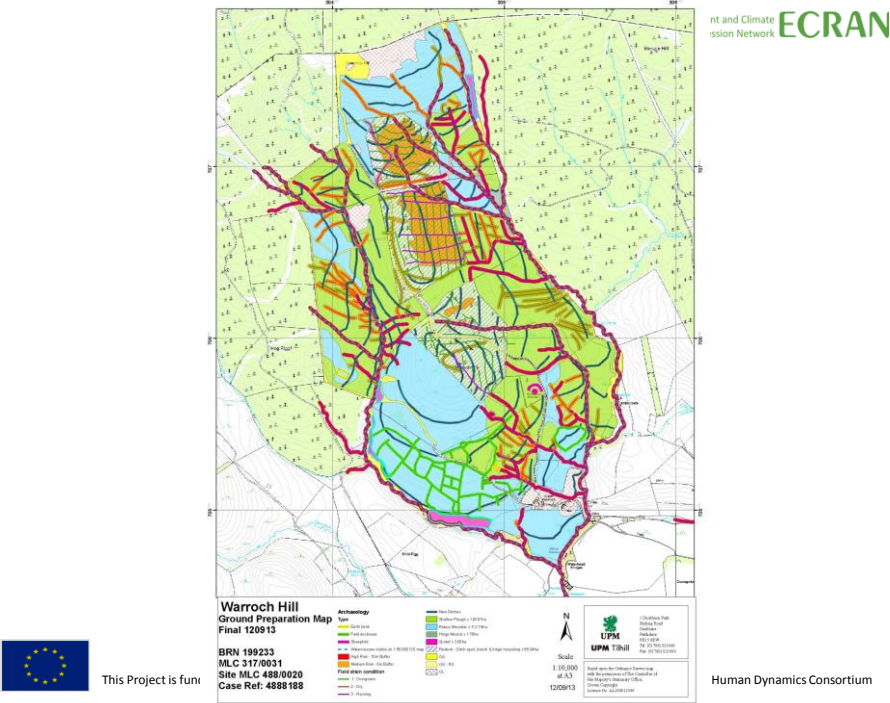
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This Project is fun

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Environment and Climate
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Colleagues at Scottish Natural Heritage
Centre for Ecology & Hydrology



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Case study



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Guidance for Woodland expansion & Golden Eagle (Aquila chrysaetos) Special Protection Areas in Scotland

Syd House
Forestry Commission Scotland



This Project is funded by the European Union



Project implemented by Human Dynamics Consortium

The Challenge

- Scotland is important for golden eagles
- Still subject to persecution;
- Eagles prefer open ground ie not forested
- Habitat change to new woodland seen as a problem by golden eagle conservationists
- But ...woodland conservation & expansion supported for many other benefits
- Can we have more woodland and no impact on eagles?



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Agreed approach

- Set up working group to commission expert research and advice
- Working Group includes statutory agencies, NGO's and independent expert advisers
- Remit: assess current guidance on eagles interacting with woodland to produce an agreed set of criteria for readily assessing woodland expansion proposals in golden eagle SPA's



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Study of one geographical region: Glen Etive & Glen Fyne Special Protection Area

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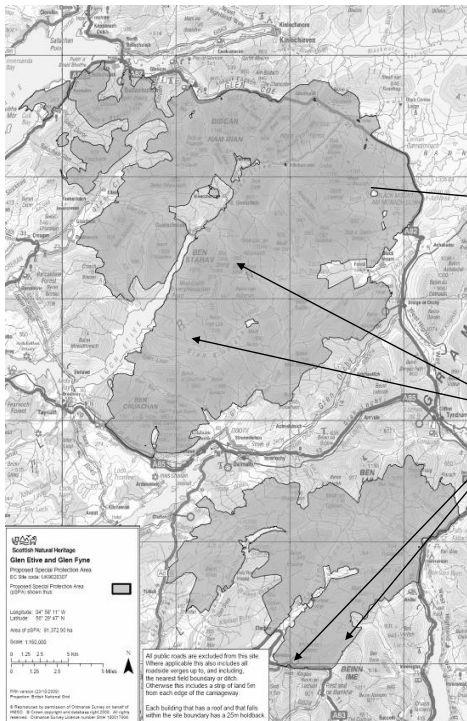
- 19 active eagle territories; 4.2% of UK population
- Minimal woodland area but desire by some land managers to extend woodland area (habitat restoration)
- Can golden eagle habitat conservation be compatible with woodland restoration?



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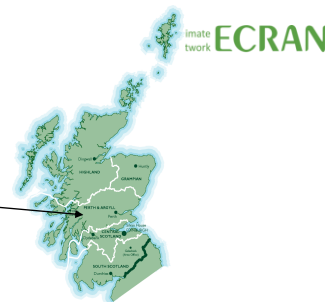
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Woodland expansion
Proposals (4 areas totalling
~ 400ha)



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Environment and Climate
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Main outcome of research review and assessment

- Many golden eagles thrive in and around areas of woodland & woodland expansion as well as open ground
- Availability of live prey is fundamental to eagles
- Golden eagles have a very wide territory. Careful study can identify critical and less critical parts of the territory
- Potential for woodland expansion in their territory without negative impact on eagle integrity (and may even improve habitat quality)



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Recommendations

- Avoid planting wet/boggy ground or area of high prey importance eg rabbit warrens
- Keep ridges free & avoid core range around nest (may be 2-3km radius but variable)
- Areas of low prey importance (eg bracken ground, short or improved grassland) can be planted with minimal or even beneficial impact
- Study of individual eagle territories will inform assessment
- Scale and design of new woodlands is critical. If sited appropriately these may enhance eagle live prey availability



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Predicting Aquila Territories (the PAT model)

- Based on assessment of range boundaries for each pair of eagles
- Mathematical modelling incorporated
- Gives proper weighting to key features such as ridges and proximity to nest
- Identifies less suitable and frequented habitat
- Produces 'predicted use' of a territory



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Figure 2. Underlying RAT Model for GF2a

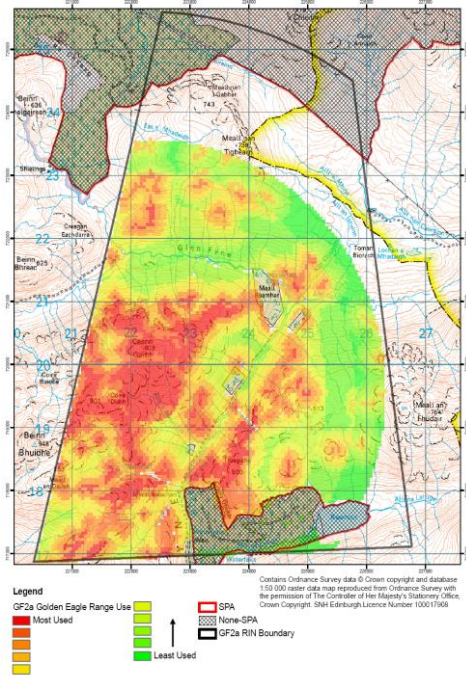
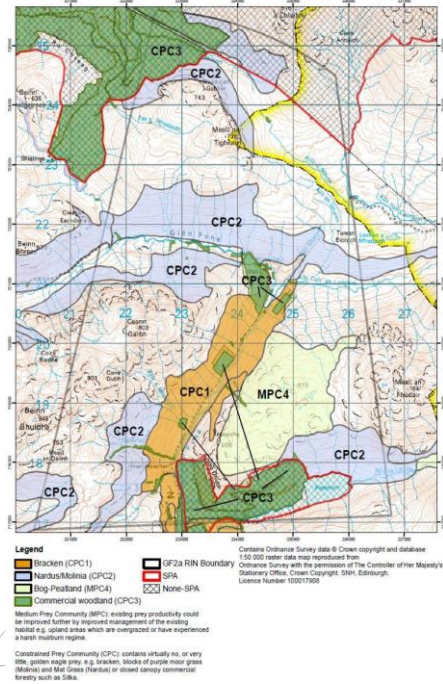


Figure 3 Predicted Medium Prey Communities (MPC) and Constrained Prey Communities (CPC) found in the range.



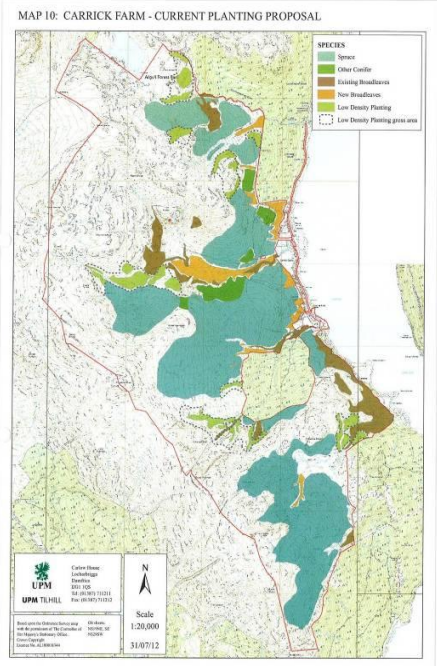
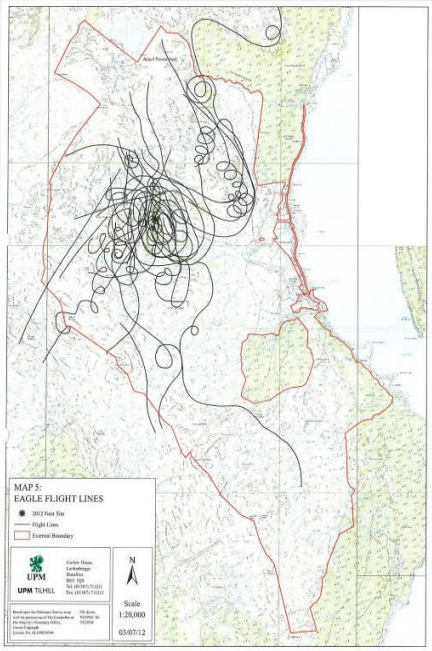
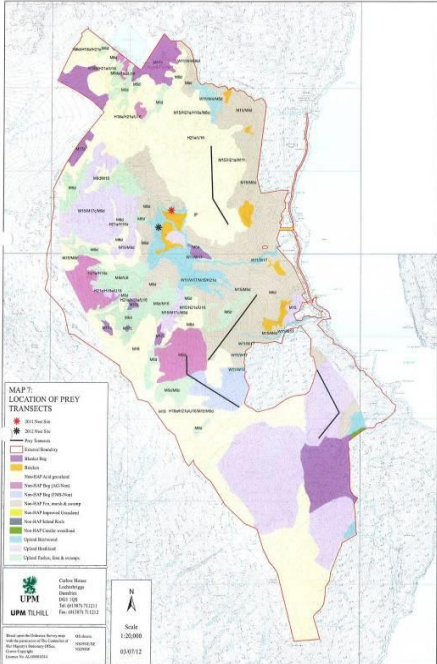
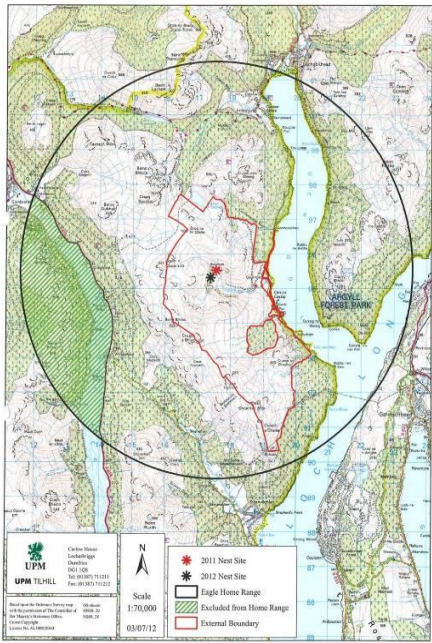
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MAP 8: APPROXIMATE EAGLE HOME RANGE



Suggested outcome

- A low-cost, robust & reliable model available to land managers who wish to undertake land management in golden eagle territories
- Supports staff required to implement EU Habitats & Species Directives
- Recognition that if the model is used correctly when considering woodland expansion, proposals may be supported and may not even require 'Appropriate Assessment' (ie if they can be shown to have a beneficial impact on the designated interest)



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Lessons learned

- It's good to talk to stakeholders prior to designation to identify concerns
- Beware unintended consequences (real threat is persecution not habitat loss) on other interests
- Beware single species conservation measures
- Good forest design, based on sound science and evidence, can address apparent concerns
- Designation should be supported by pro-active engagement to seek stakeholder support and address perceived concerns



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