Natural Heritage Reporting and Indicators

Statutory requirements
Corporate justification
User community needs

Ed Mackey
Head of Environmental Audit Unit, SNH

Environmental Audit Links
Statutory Requirements

Natural Heritage (Scotland) Act 1991

Aims and purpose foster understanding

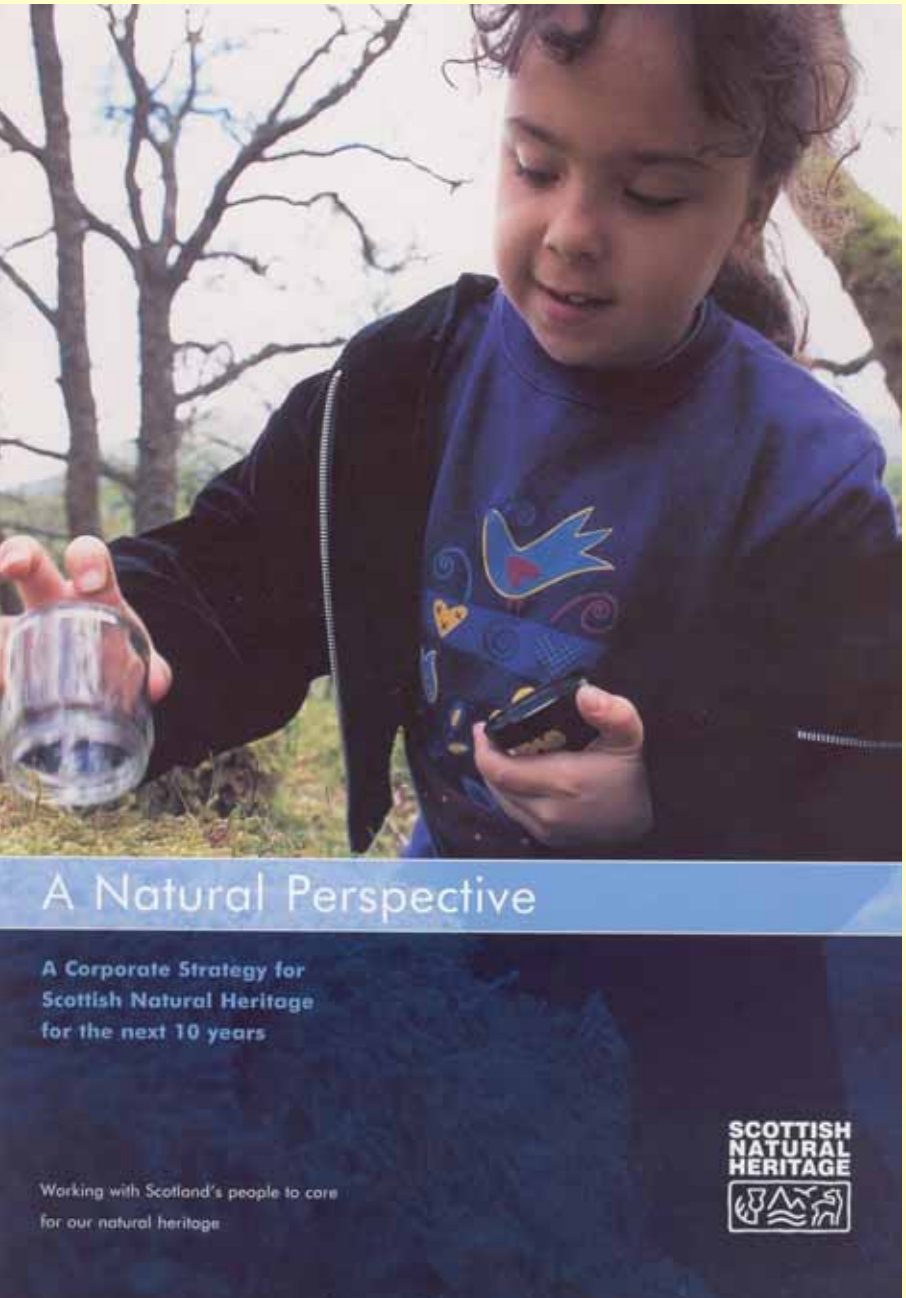
General functions research & dissemination of knowledge

Environmental Information Regulations

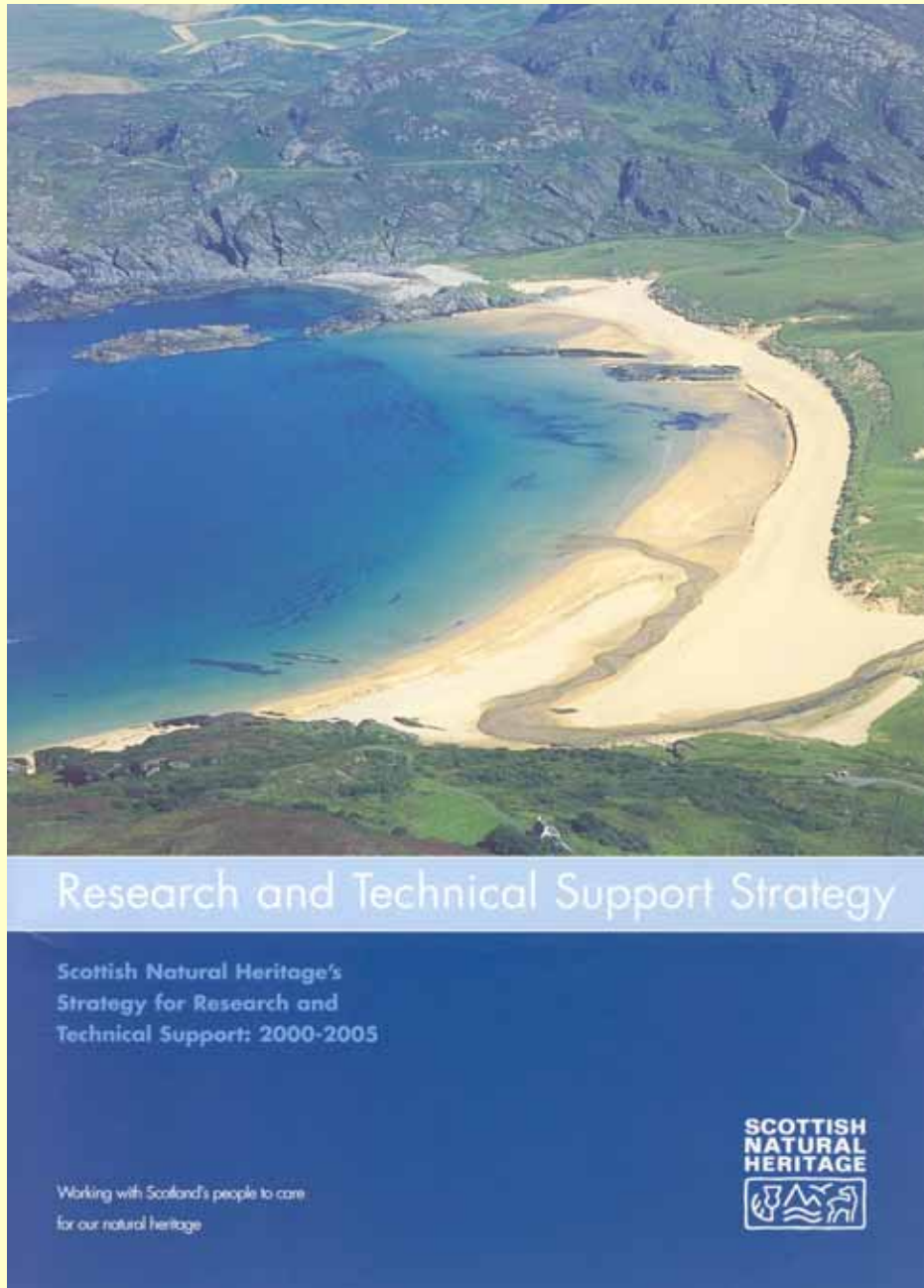
Openness public access

Delivery 21st Century Government

Corporate Strategy



Research Strategy



Corporate Strategy

Caring for the natural world

Natural diversity and processes
Landscape and natural beauty
Integrated approaches
Trends and changes

Our priority is:

to improve understanding of the way the natural heritage works

by documenting changes and trends in it, and explaining these and their causes widely

Research Strategy

Understanding the state of the natural heritage

Site condition monitoring
National Parks
Monitoring change & perceptions
5-yearly reporting
UK and EU context

Our priority is:

support for a comprehensive report on the State of the Natural Heritage to be published at 5-yearly intervals

putting in context Scotland's natural heritage at the UK and EU level

Research Strategy

support for audit reports based on themes, geographical areas and issues

development of natural heritage and sustainability indicators

Understanding the causes and nature of change

Our priority is:

- Environmental change
- Ecosystem processes
- Socio-economic influences
- Enjoyment
- Public attitudes & education

Good practice in care and management

- Restoration and enhancement

To sum-up, we shall:

Document changes and trends, explaining these and their causes:

a) report 5-yearly on the State of the Natural Heritage

b) place in context at the UK and EU level

c) audit by theme, geographical area and issue

d) define natural heritage and sustainability indicators

Environmental Audit Priorities

SCOTTISH NATURAL HERITAGE

Importance

Corporate priorities
Strategic scientific issues
Replication of audit findings

Vital to policy & advice
Important to knowledge base
Relevant for context

Urgency

Anticipated environmental consequences
Political or public concern
Unfolding events & timeliness

during ***Operational Plan***
during ***Corporate Plan***
beyond Corporate Plan

Feasibility

Data availability and NHZ updates (data rich)
Collaborative opportunities (skills & knowledge)
Deliverable (resources)

Window of ***opportunity*** exists
requires ***further preparation***
Considerable ***obstacles***

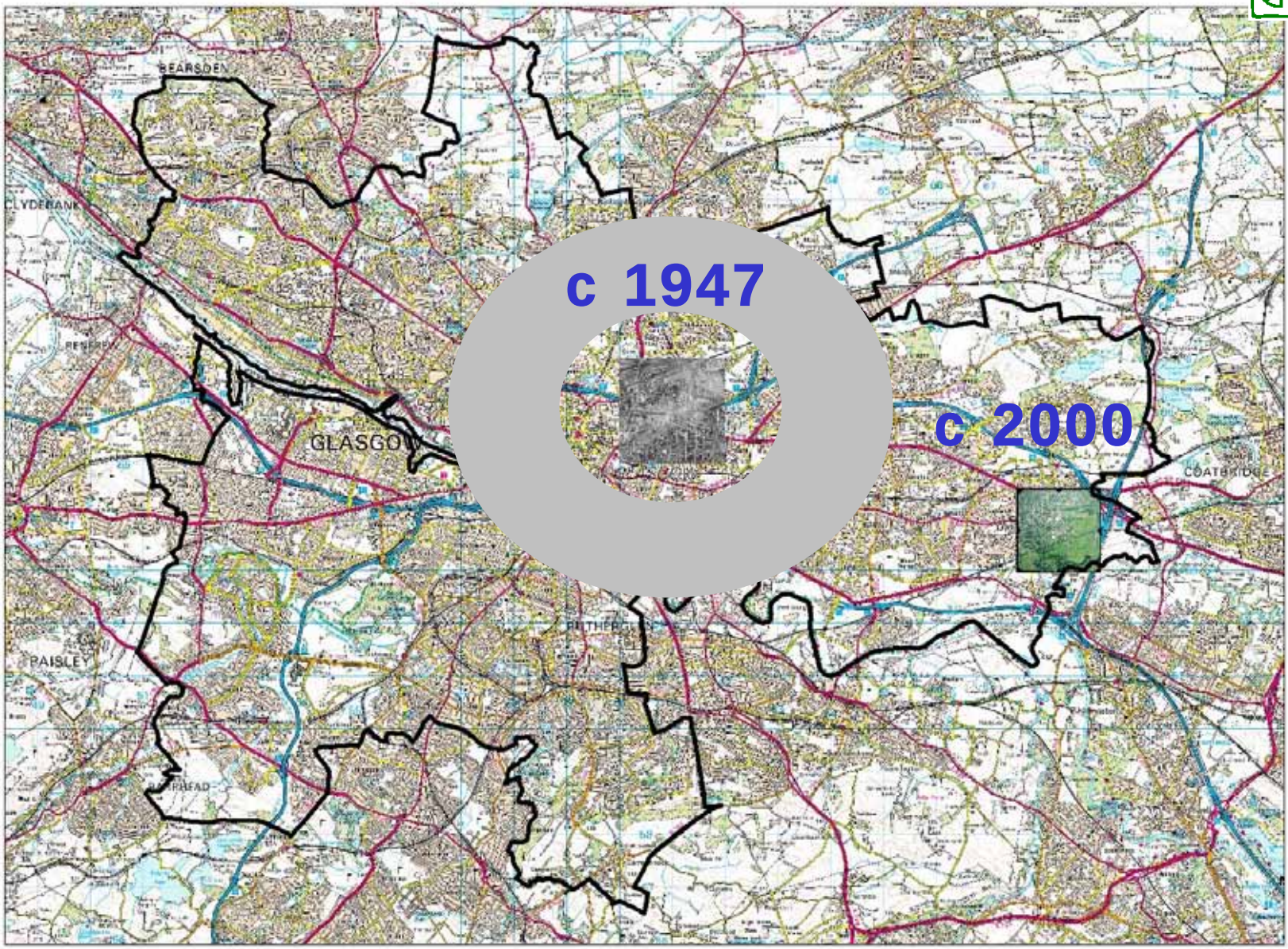
Current Activities

Global Environmental Concerns
Countryside Change
Alien Species (terrestrial & freshwater)
The Seas Around Scotland
Fresh waters
Settlements

What do the outputs look like?

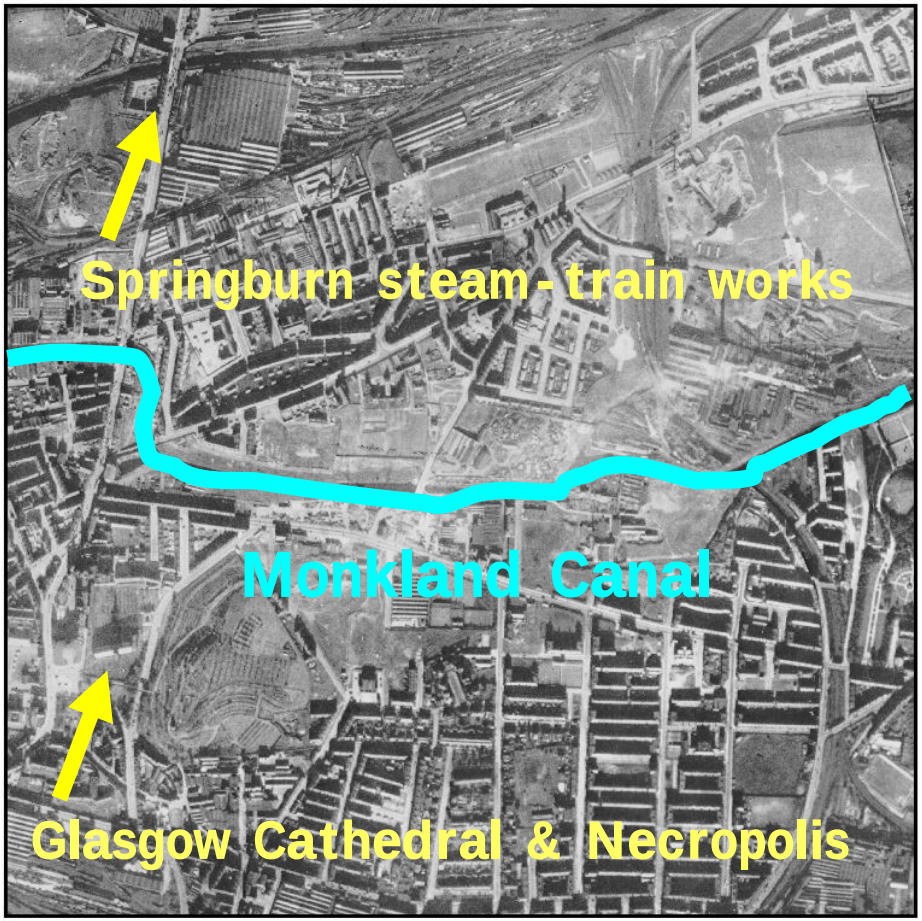
Change revealed by aerial photography

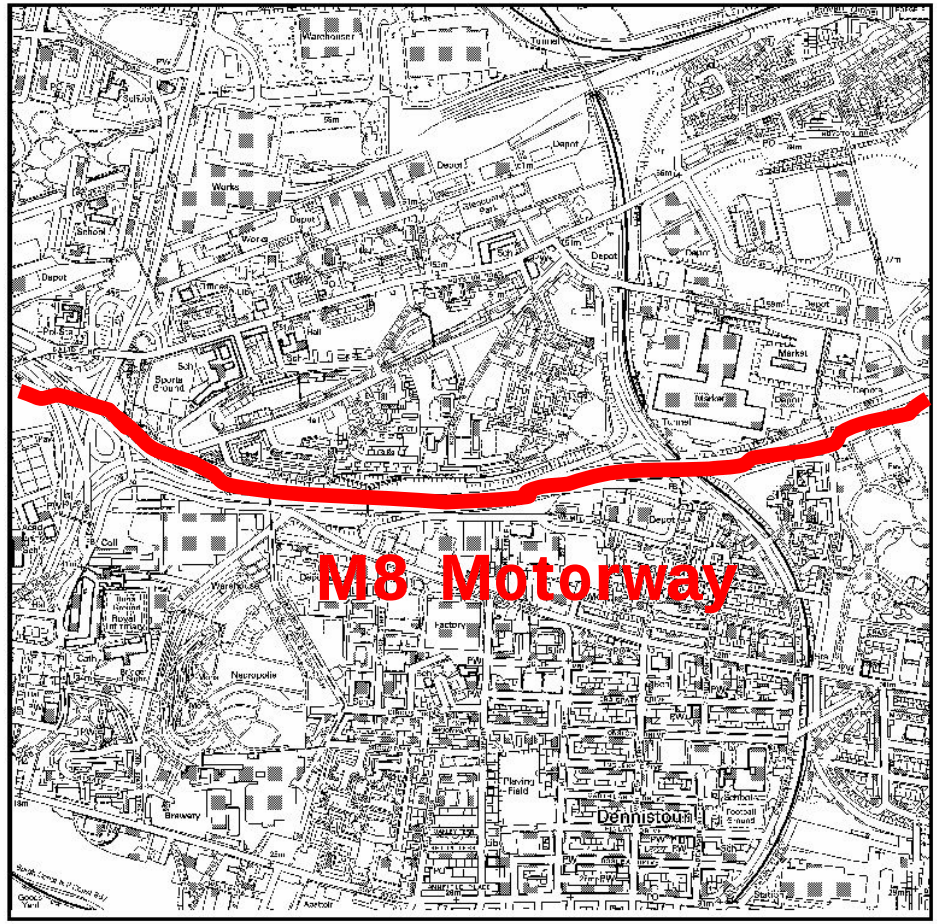
SCOTTISH NATURAL HERITAGE



Change revealed by aerial photography

SCOTTISH NATURAL HERITAGE





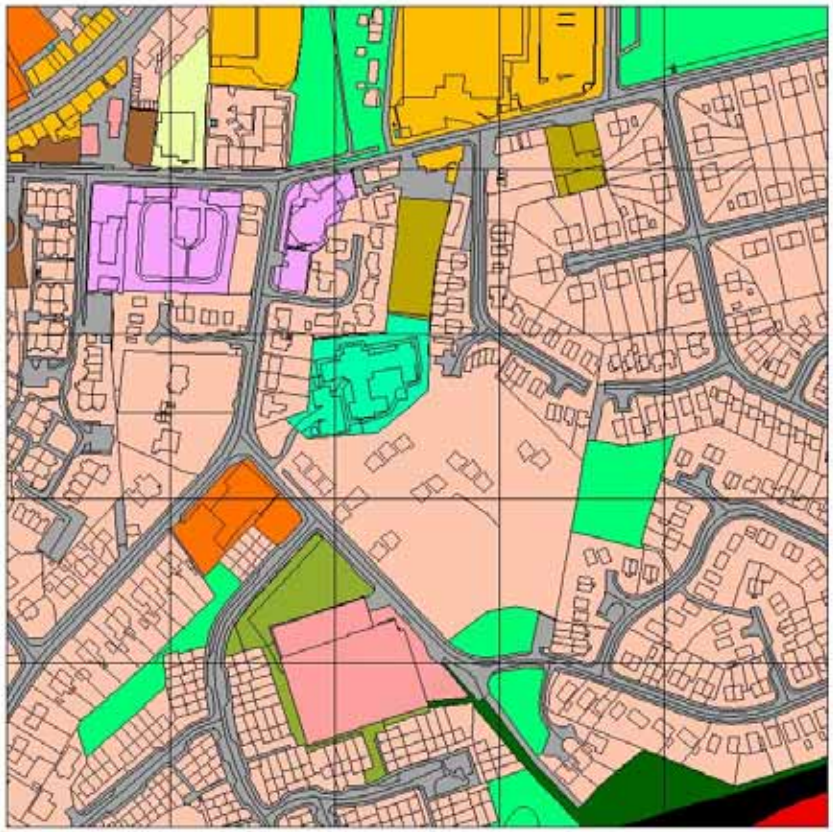
c 1947

c 2000

Mapping greenspace

Source: The Geoinformation Group

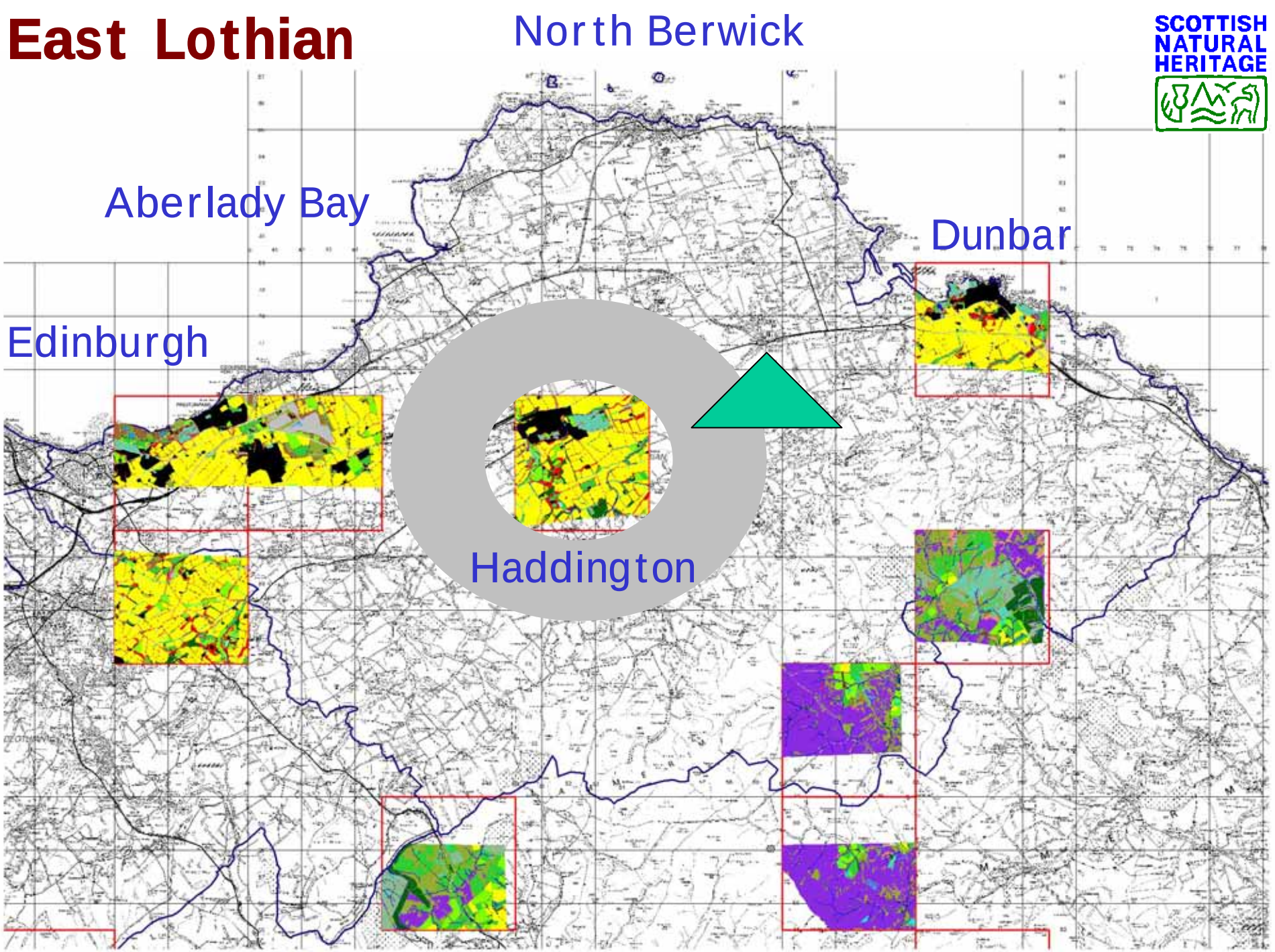
SCOTTISH NATURAL HERITAGE



Land Use

- Improved pasture
- Broadleaved woodland
- Scrub
- Outdoor recreation
- Roads
- Railways
- Residential
- Institutional and communal accommodation
- Institutional buildings
- Religious buildings
- Industry
- Offices
- Retailing
- Storage and warehousing
- Utilities
- Derelict land

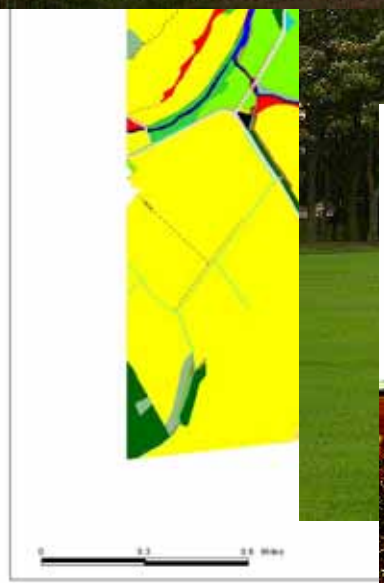
East Lothian



parkland

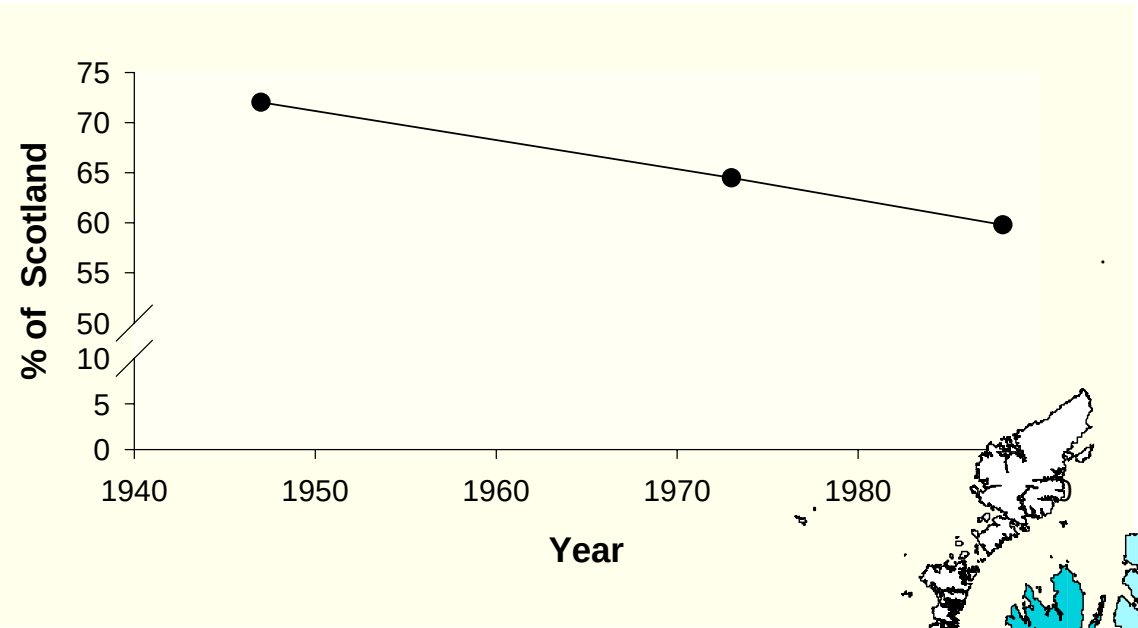
g

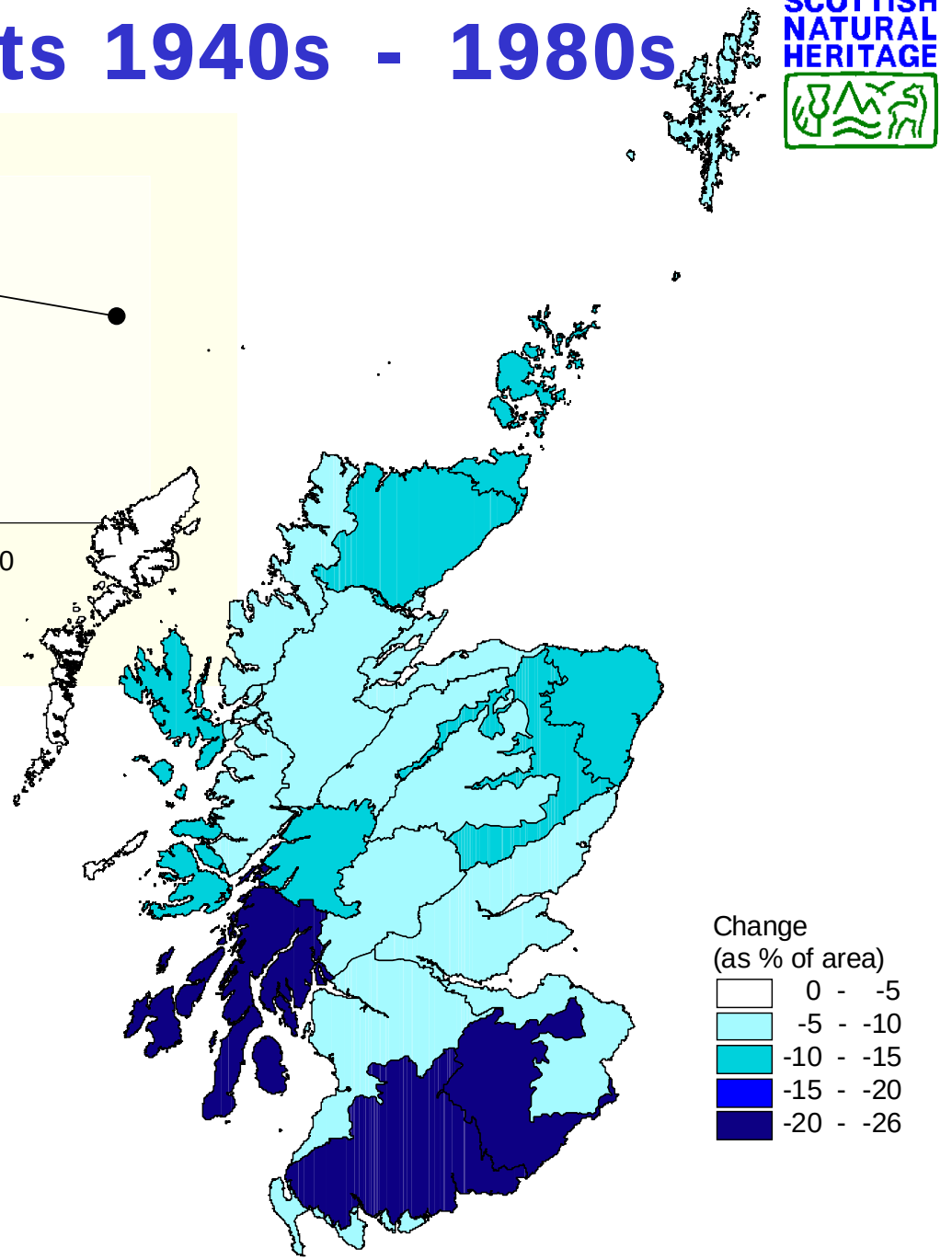
Transport Corridor (67.0)



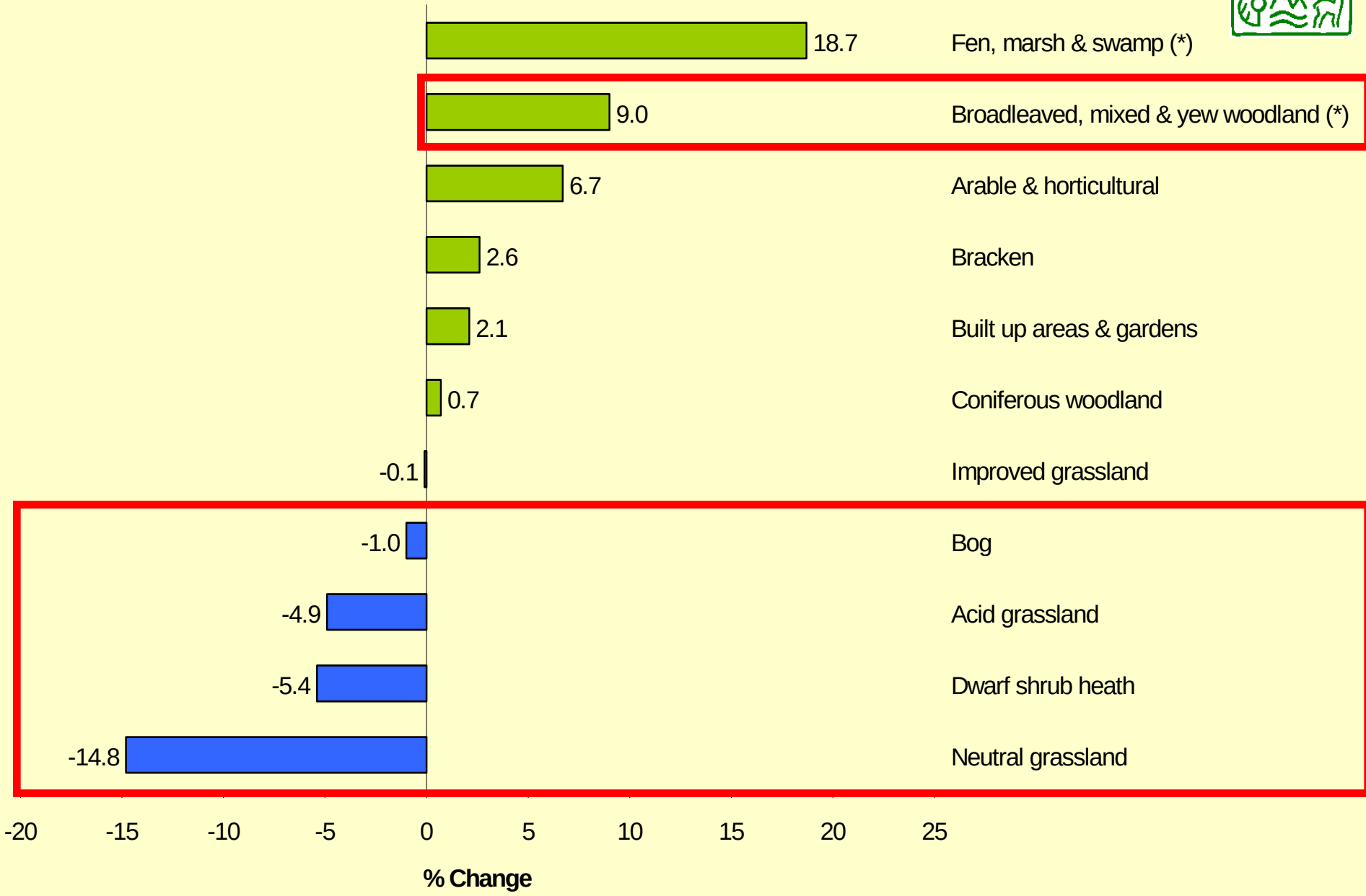
hedgerow removal

Semi-natural habitats 1940s - 1980s





Broad habitats 1990 - 1998



Since the 1950s throughout the UK

SCOTTISH NATURAL HERITAGE

Natives and archaeophytes (pre AD 1500)	decreased
Neophytes (introduced after AD 1500)	increased
Northern species	retreated
Southern species	advanced
Species of base-poor conditions	declined
Species of base-rich conditions	increased

Dunbar is the richest 10km square in Scotland, with 619 species

Arable, estuary, saltmarsh, coastal dune, upland, ravine woodland

Greatest relative declines among arable species

UK survey of flowering plants and ferns (1999)

New Atlas of the British and Irish Flora

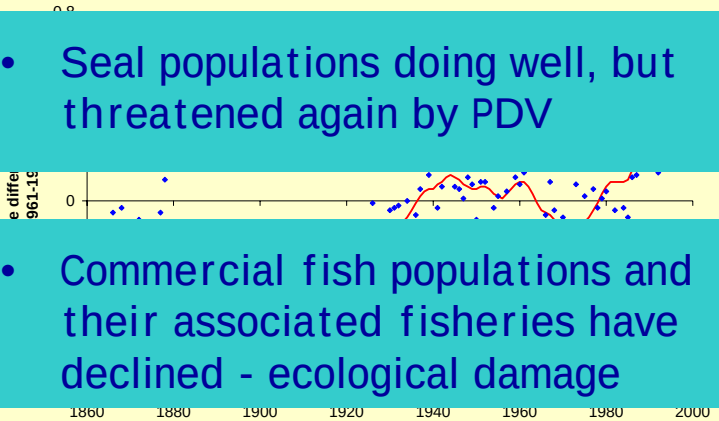
Trends in terrestrial and freshwater species

- Widespread butterfly species have tended to expand in range while scarce species have contracted.
- In recent decades land mammal, freshwater fish and rare vascular plant species have declined.
- Land bird species have shown mixed fortunes …
- … but the majority of seabird, wader and wildfowl species have increased in abundance.

Group	Period	Trend		
Rare and endemic vascular plants	1990 - 1996	40% ⇩	29% ⇔	31% ⇧
Butterflies	To 2000	19% ⇩	62% ⇔	19% ⇧
Freshwater fish	To 2000	50% ⇩	35% ⇔	15% ⇧
Breeding seabirds	1967 - 1987	22% ⇩	17% ⇔	61% ⇧
Wintering wildfowl	1966 - 1998	22% ⇩	11% ⇔	67% ⇧
Wintering waders	1969 - 1998	9% ⇩	0% ⇔	91% ⇧
Breeding land birds: *Range size*	c. 1970 to c. 1990	31% ⇩	50% ⇔	19% ⇧
Breeding land birds: *Abundance*	1994-1999	16% ⇩	63% ⇔	21% ⇧
Land mammals	To 2000	42% ⇩	31% ⇔	27% ⇧
Species given legal protection	To 1997	36% ⇩	48% ⇔	16% ⇧
Introduced plant species	1950s to 1987-88	2% ⇩	86% ⇔	13% ⇧

Trends in marine species

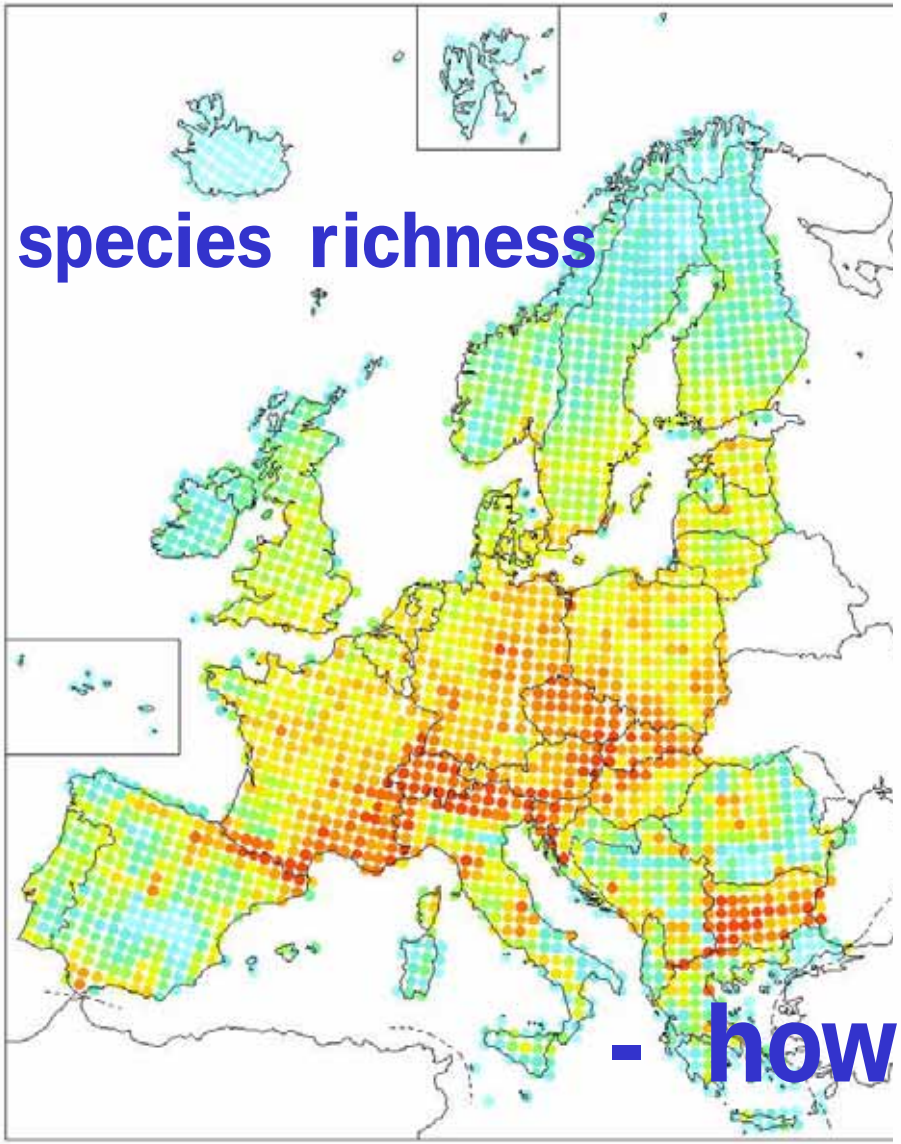
- Most breeding seabird species increased in abundance during the '70s and '80s, but some have benefited from fishery discards
- Gross pollution reduced, but diffuse pollution and enrichment remain problematic
- Trends consistent with climate change are becoming evident
- Seal populations doing well, but threatened again by PDV
- Commercial fish populations and their associated fisheries have declined - ecological damage

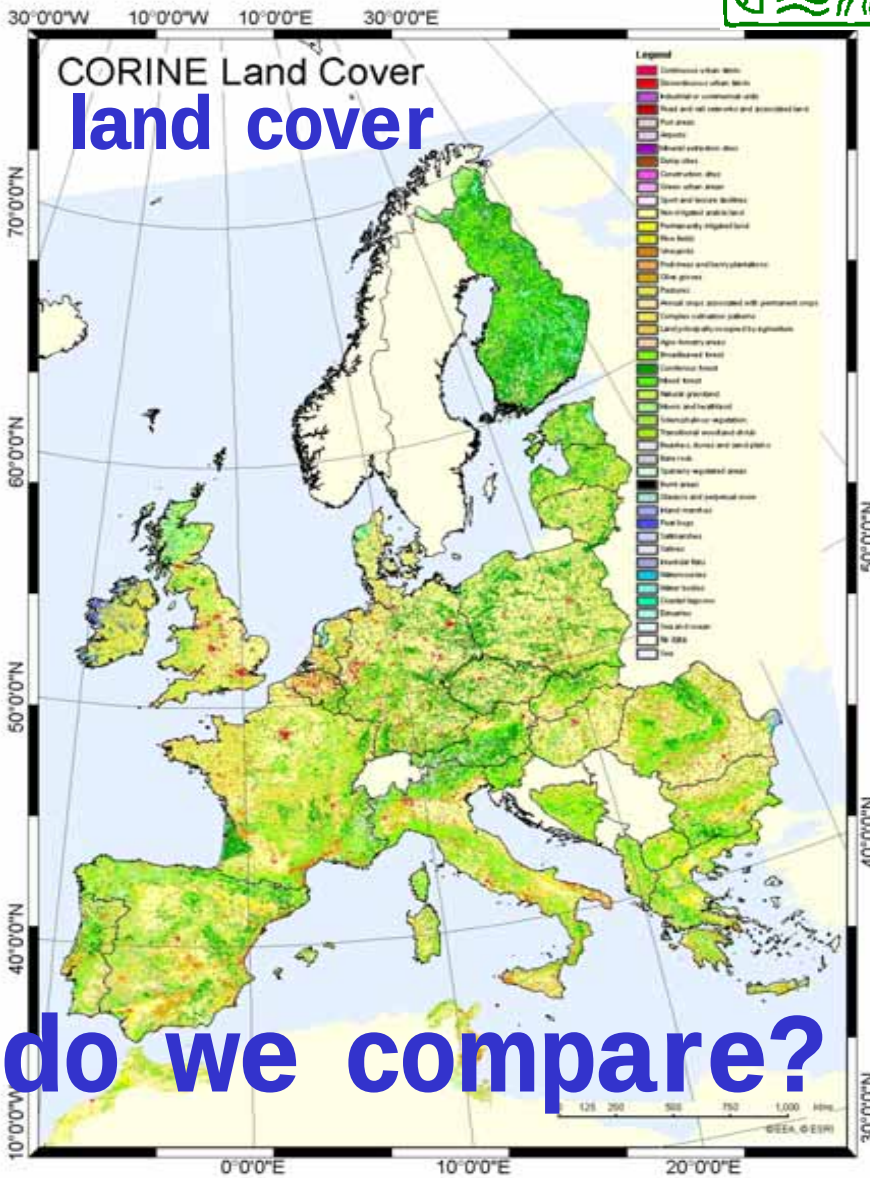


Theme	Period	Trend		
Cetacea	c.1986-2000	3 Species ⇩		2 Species ⇧
Abundance				
Strandings	1992-2000		⇔	
Breeding seabirds	1967-1987	22% ⇩	17% ⇔	61% ⇧
Environment Quality				⇧
Coastal, estuarine	*1996-1999*			
Mariculture				⇧
Farmed salmon production and sites	1979-1999			
Farmed shellfish production	1986-1999			⇧
Climate Change				0.6mm/yr ⇧
Seawater level, Aberdeen	*1862-1999*			
Storminess: wave height	1969-1999			2.5-7.0 mm/yr ⇧
Mean sea temperatures	1980-1998			0.5 – 1.0°C ⇧
Basking Shark: ***North Atlantic fishery***	1946-1996	90% ⇩		
Common Seal	1989-2000		⇔	
Grey Seal	1984-1997			6% per year ⇧
Commercial fish landings: populations	1989-99	9 ⇩	3 ⇔	2 ⇧
Fishing mortality: populations	1989-99	8 ⇩	5 ⇔	0 ⇧
Spawning stock biomass: populations	1989-99	6 ⇩	2 ⇔	5 ⇧

Our place in Europe

SCOTTISH NATURAL HERITAGE

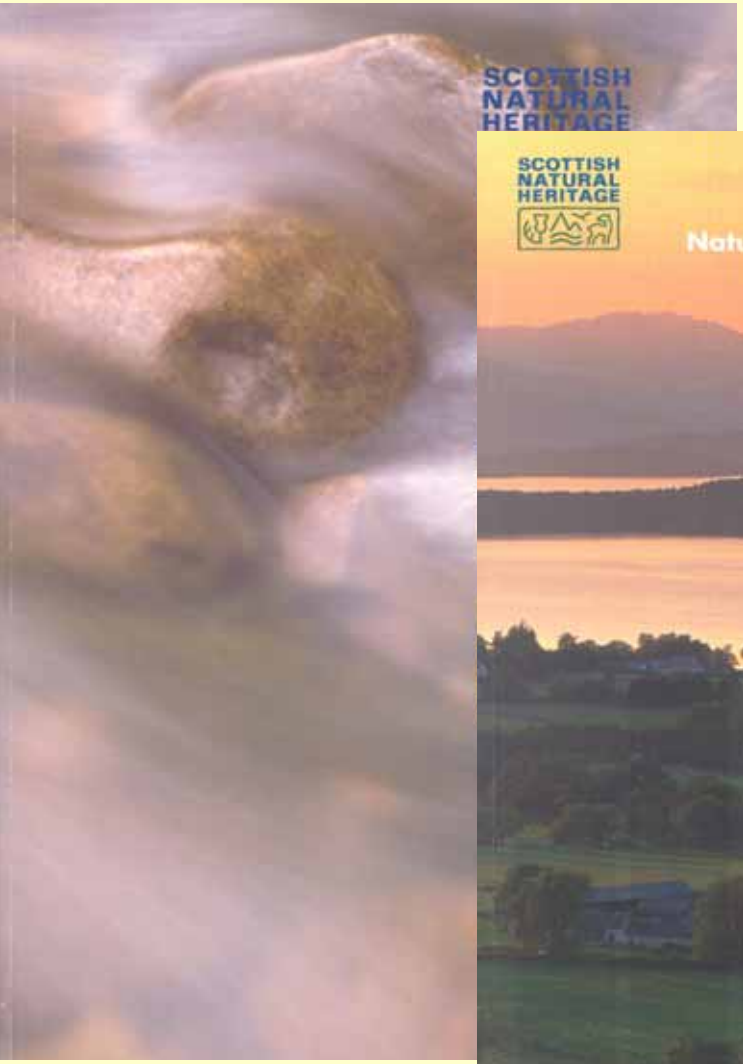


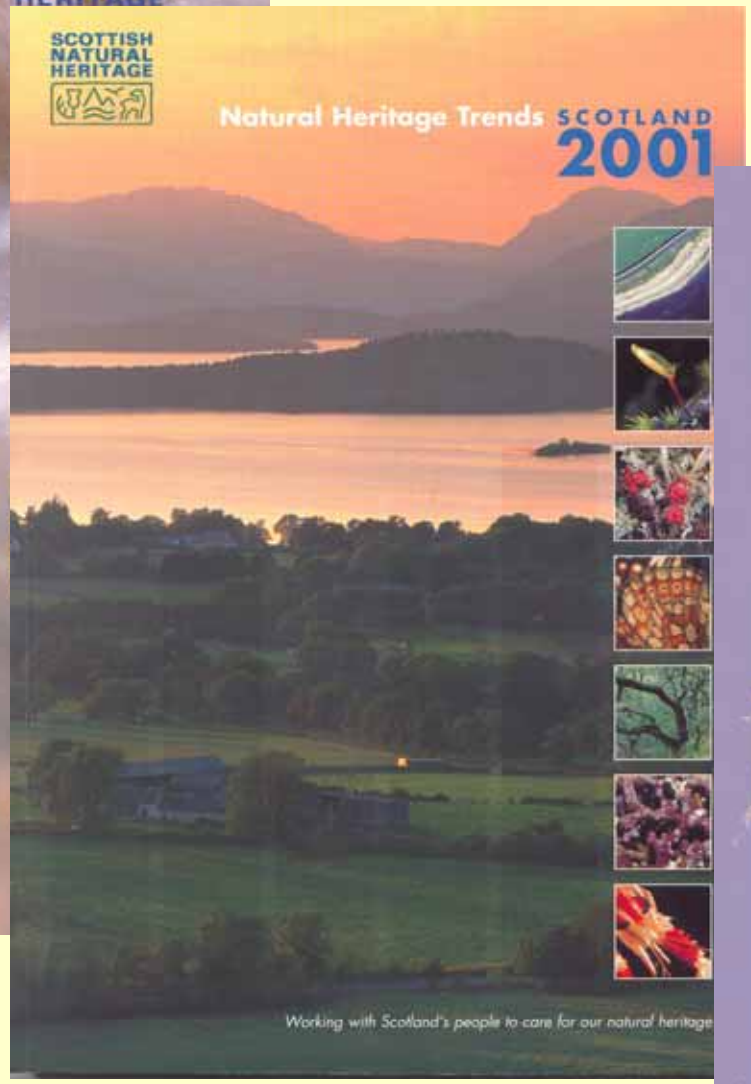


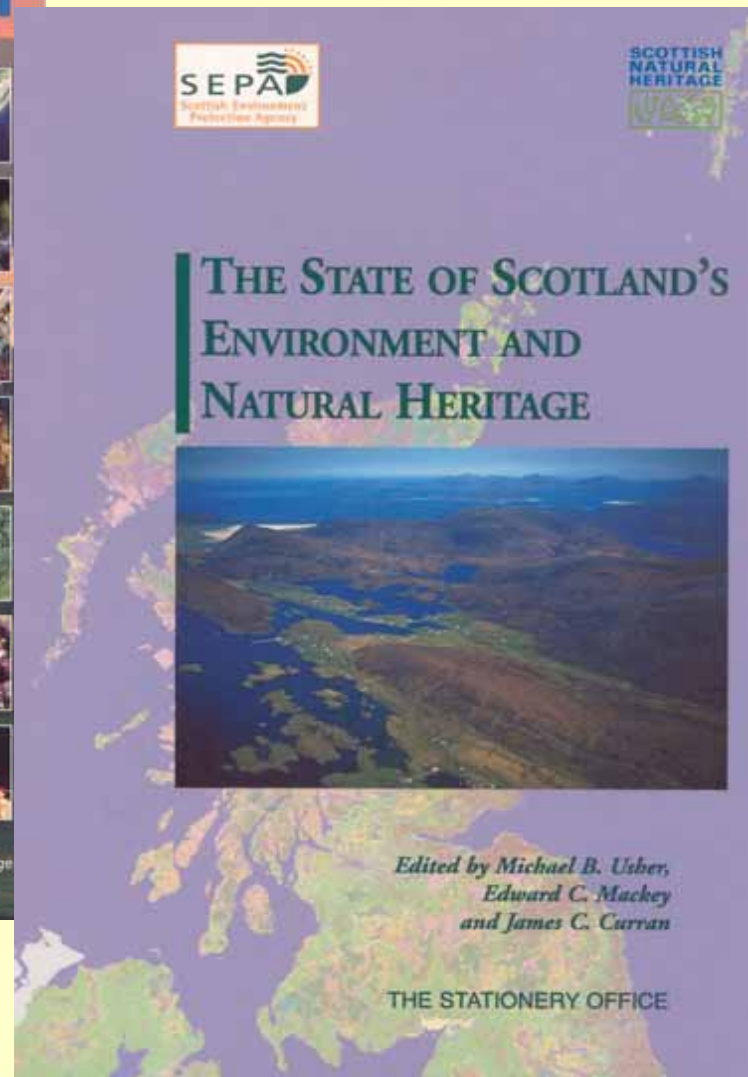
- how do we compare?

User Community Needs

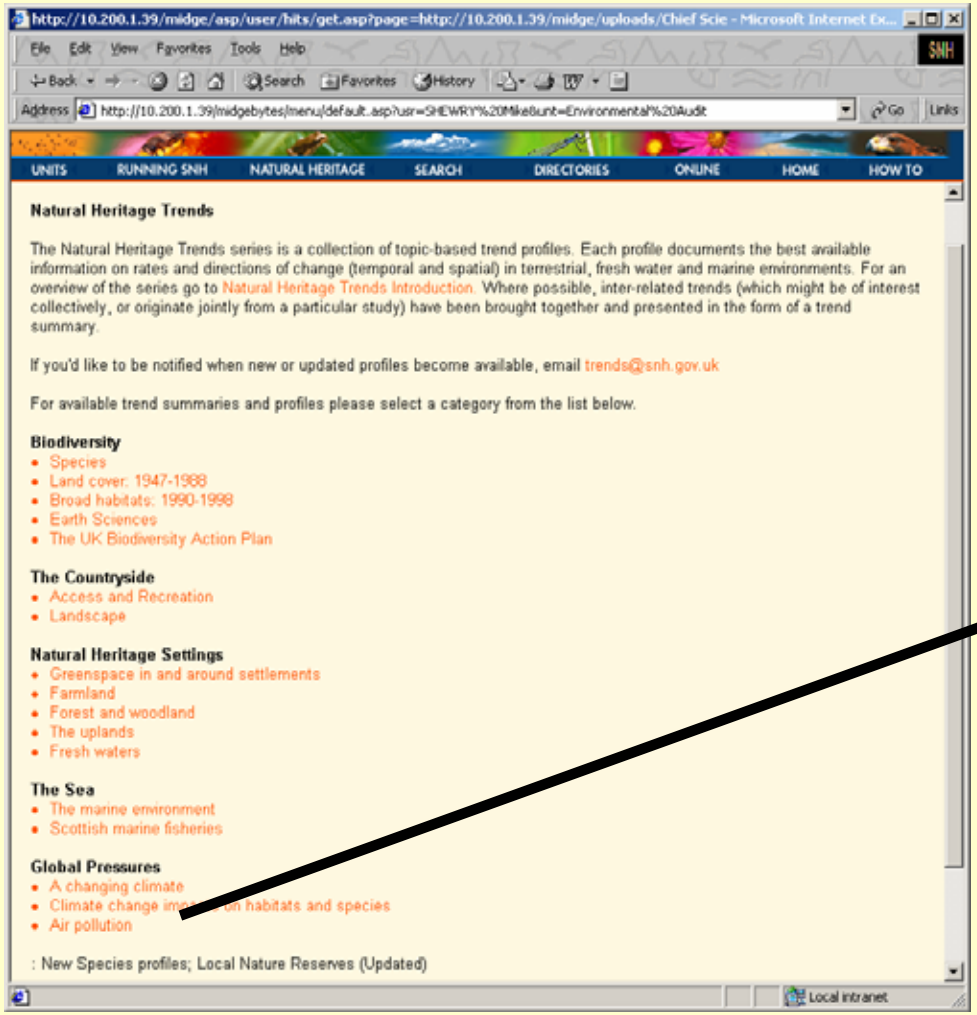
Publications

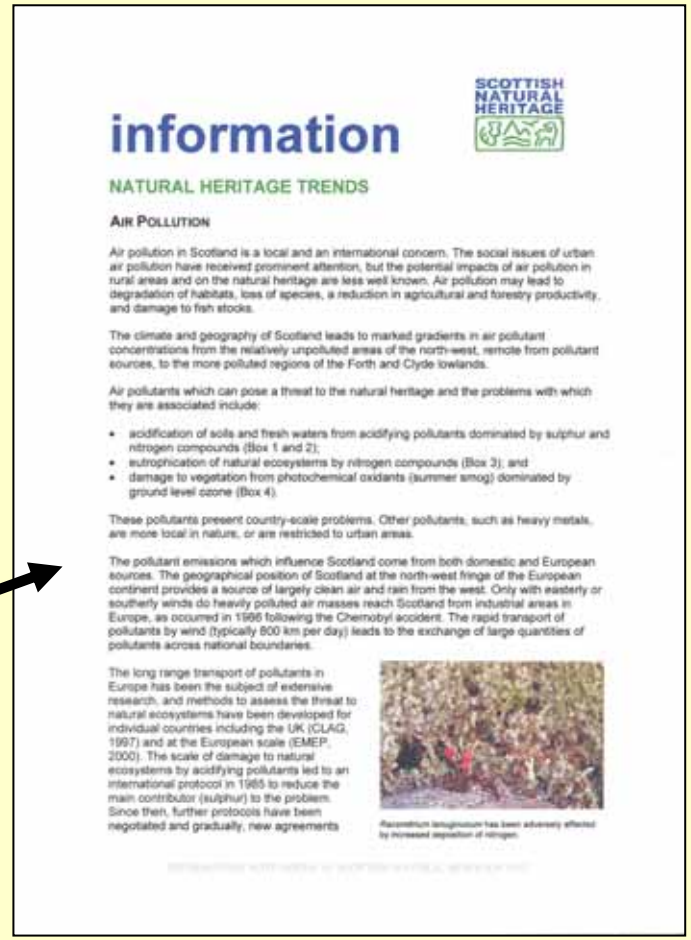






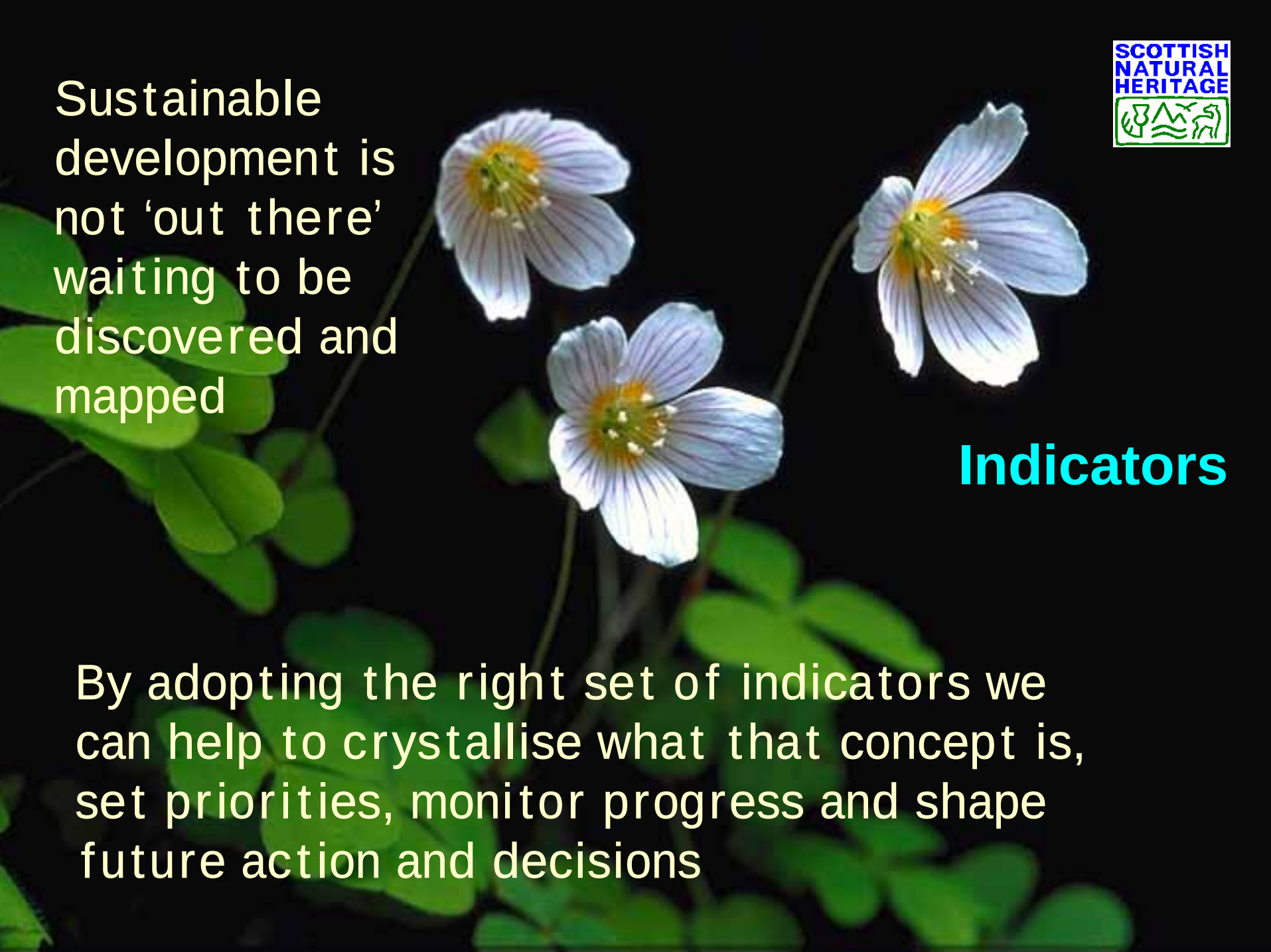
Internal - trends on the intranet





External - trends on the internet

- organised by theme
- grouped by topic
- date stamped
- feedback



Sustainable development is not 'out there' waiting to be discovered and mapped

Indicators

By adopting the right set of indicators we can help to crystallise what that concept is, set priorities, monitor progress and shape future action and decisions

Natural Heritage Indicators

SCOTTISH NATURAL HERITAGE

We need to synthesise signals of change into a clear interpretation of the state of the natural heritage

which is relevant to SNH purposes and which provides an authoritative public account.

Natural Heritage Indicators

SCOTTISH NATURAL HERITAGE

Review of best practice and internal discussion (draft paper)

Policy relevant	Outcomes / target levels / early-warning
Analytically sound	Data described / sources referenced
Easy to understand	Clear interpretation for non-specialist
Based on existing data	Best available data / frequent updates
Appropriate scale	Applicable / consistent

Natural Heritage Indicators

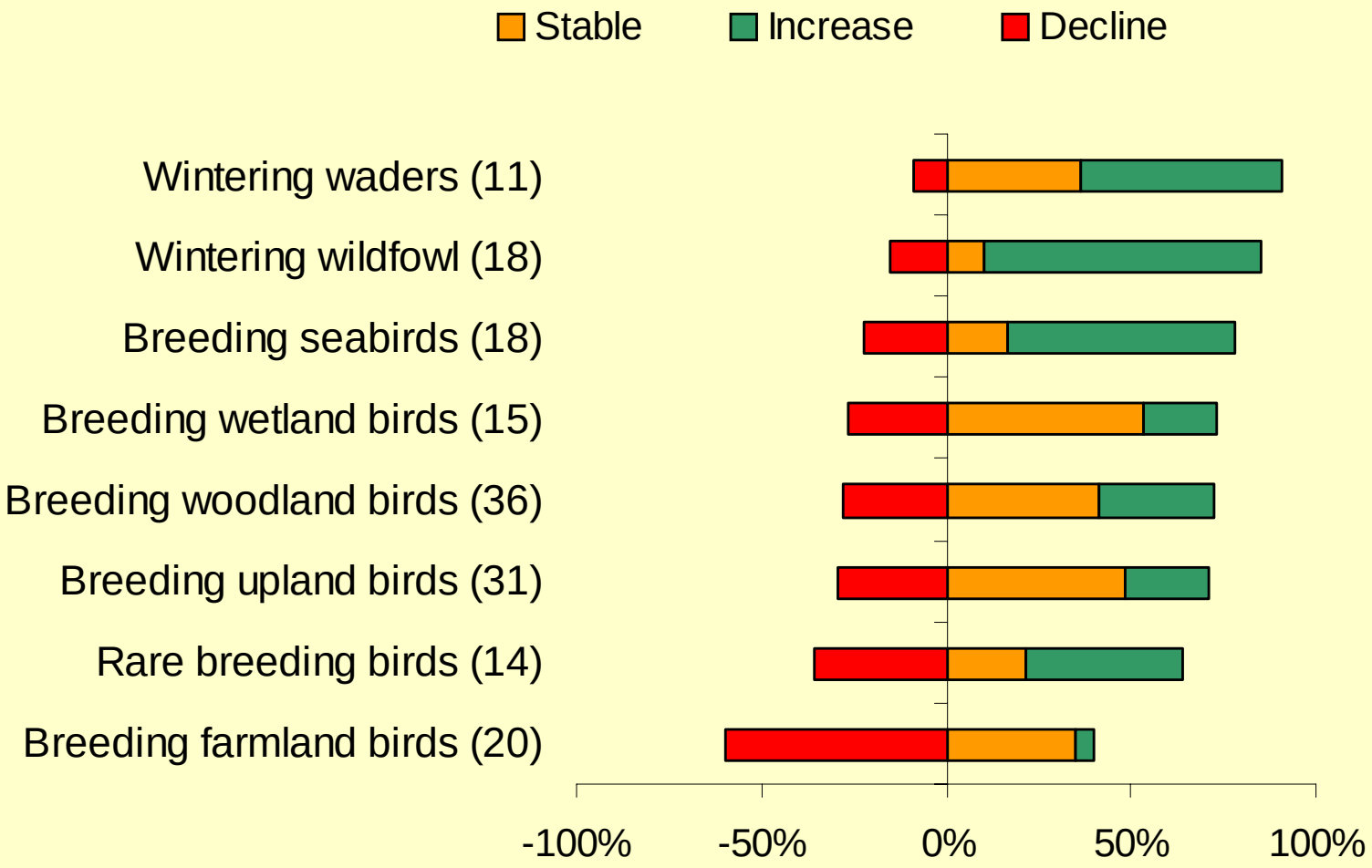
Corporate Strategy	Themes & priorities
NH Futures	Objectives (Zones)
NH Trend	Potential data availability
Indicator	Representative of each theme
Appropriate scale	Nationally applicable / consistent

Natural Heritage Indicators
Examples

Caring for the natural world	BAP outcomes
	Condition of notified interest on sites
	Landscape change
	Wild birds x settings
	Informal recreation
	Path networks
Attractive places to live	Greenspace
	Awareness / public attitudes
Sustainable use	Grazing intensity in the uplands
	Forest & woodland networks
	Ecological status of fresh waters
	Status of marine fish stocks

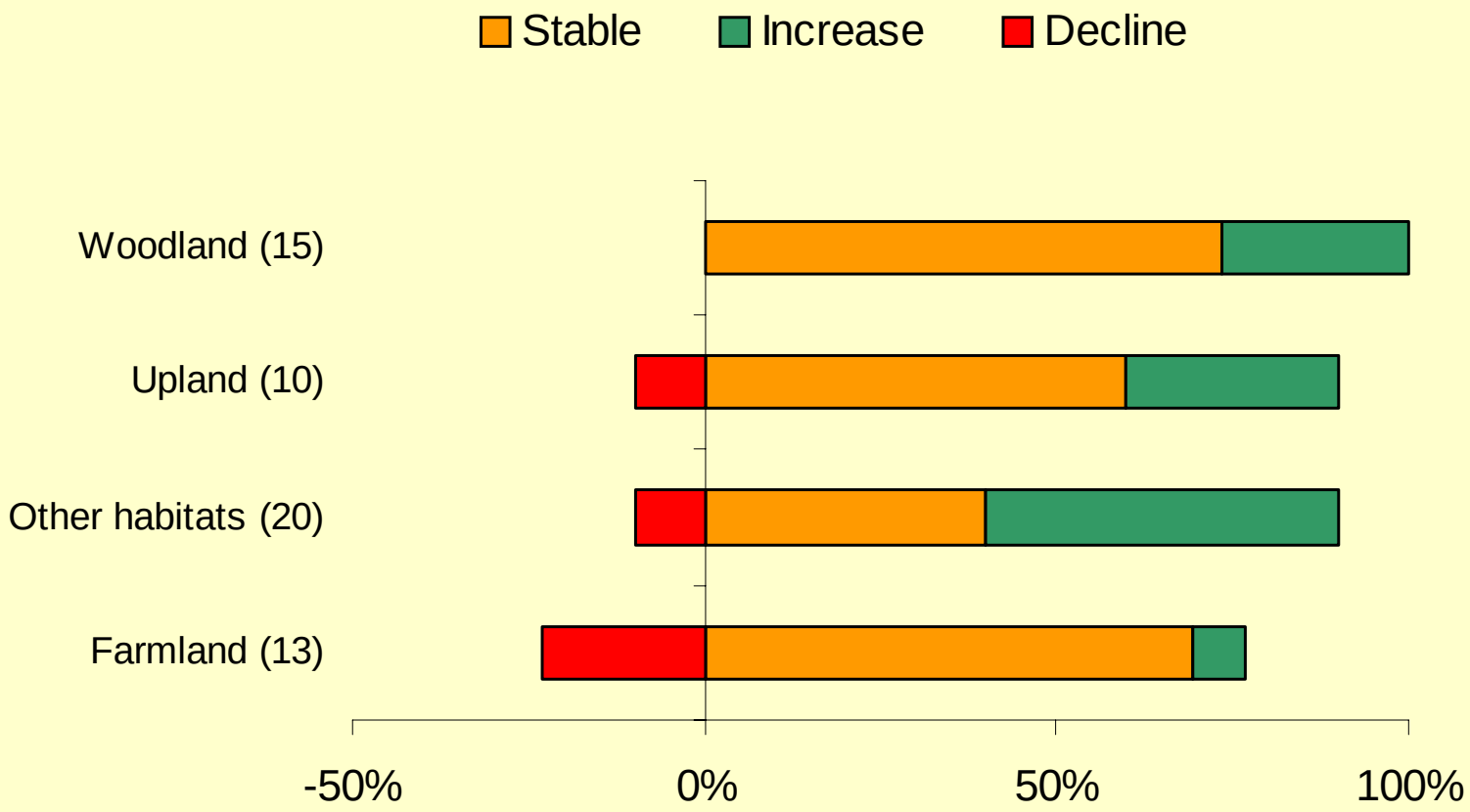
Bird population trends: long-term

Changes in range or abundance: 1960s-70s to 1990s



Bird population trends: short-term

Changes in abundance: 1994-2000



Steer from SAC

Approach	Welcome, essential, urgent
Coverage	Not just rarities but also widespread change
Pragmatic	Develop a manageable list
Outcomes	Do we make a difference?
Scope	Remit - inc. landscape, physical processes

GO FOR IT!

Natural Heritage Audit
Next Steps

SCOTTISH NATURAL HERITAGE

National Strategy — **Evidence-based policy**

Collaborative working — **CEH-MLURI**
Academic community

Develop — **DPSIR framework**
Ecosystem processes
Physical, landscape, enjoyment

Harmonisation — **Reporting obligations**
Joint working with SEPA

Trends analysis — **Deliver annual series**