

Managing Upland Catchments - priorities for water and wetland conservation

Water Resource Management

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Water & Biodiversity - the global commitments

2002 - WSSD Johannesburg

Plan of Implementation

Halve number of people without access to safe drinking water by 2015

Halve number of people without access to adequate sanitation by 2015

Develop integrated water resource management and water efficiency plans by 2005

Significant reduction of biodiversity loss by 2010

Water & Biodiversity - the global commitments

Ramsar Convention - Valencia November 2002

Key issues

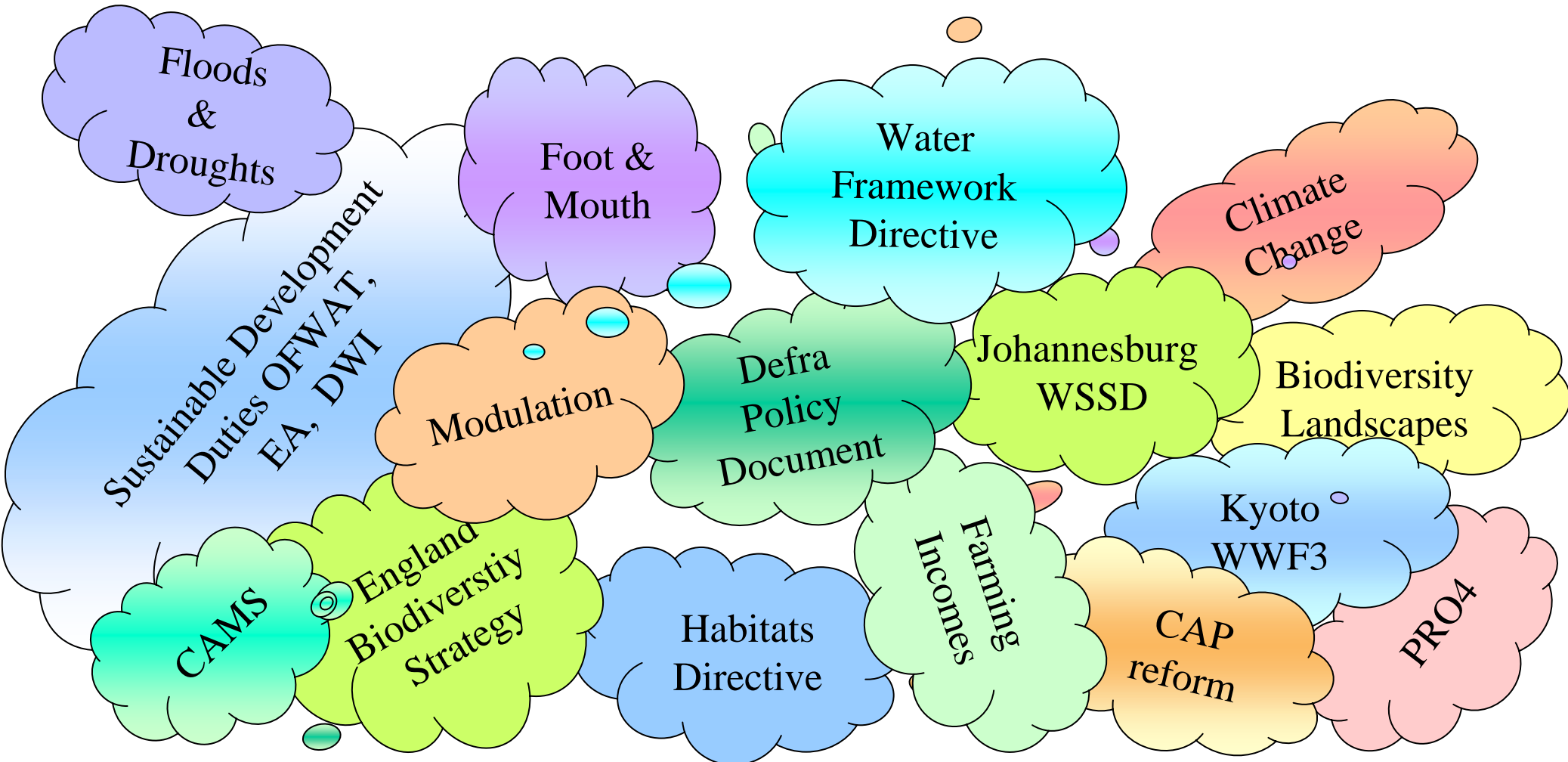
Agriculture and sustainable wetland management

Cultural value of wetlands in different societies

Impact of climate change

Invasive species

Upland Catchments - Water & Habitats



Water Companies at the Receiving End

Nutrient and Fertilizer run off

Herbicides and Pesticides

Soil Erosion

Water Colour

Crypto, E.coli

Flash Floods, Storm sewer overflows

Land Management & Biodiversity conservation

Biosolids disposal

Water Quality & Nutrients

Nitrate and phosphate increase dramatically in storm conditions

- **Catchment run off**
- **Bankside erosion**
- **Effluent (agricultural/domestic/industrial)**

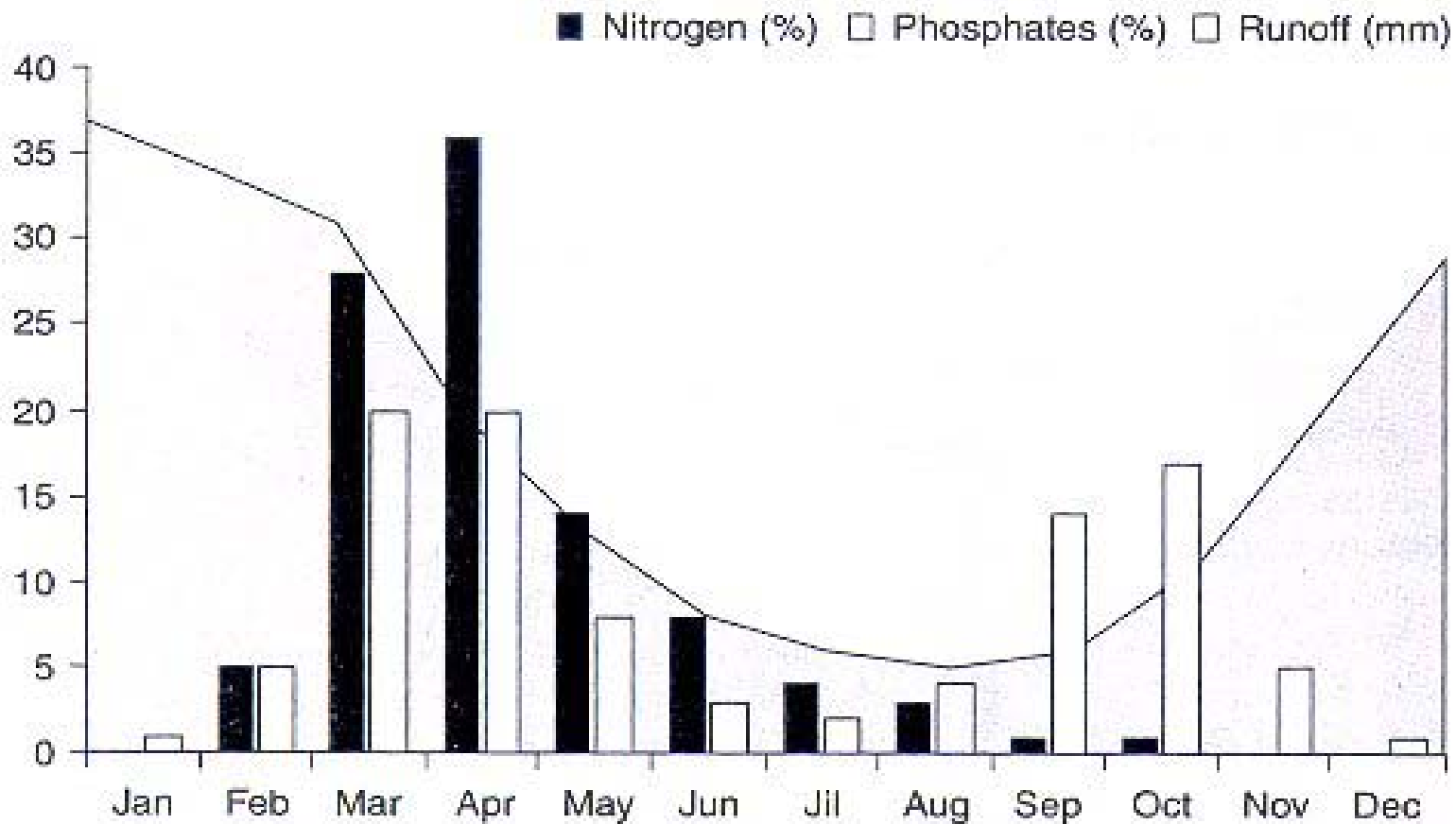


Figure 1.4. Monthly nutrient use and typical catchment runoff

Water Quality and Pesticides

- Capital investment to remove nitrates and pesticides - over £500 million last 5 years
- 1/3 UK Water is groundwater and cost of treatment increasing
- 70% of UK Water from Uplands
- Re-seeded pastures particularly bad
- 68% all failures in Thames area due to IPU alone

Water Quality and Soil Erosion

- **Intensive Arable**
 - lower soil organic matter
 - **Compaction and reduced infiltration (machinery)**
- **Pastoral**
 - **Soil Compaction and vegetation loss (over grazing)**
- **Change from spring to autumn sown cereals**
- **Surface Erosion 0.55 tons/ha/yr. from agricultural land**
- **85% sediment loss from 10% catchment (Canadian study)**

The True Cost of Modern Agriculture

£ million p.a

Pesticides in Drinking Water	120
Nitrates	16
Cryptosporidium	23
Phosphate and Soil	55
Damage to habitats and walls	125
Gas emissions	1113
Soil Erosion and Organic Carbon Loss	106
Food Poisoning	169
B.S.E.	607

Total £2,343 million per annum (1996 costs)

Pretty et al (2000)

Current End of Pipe Solutions

Fragmented management of water issues

No input to planning process

Failure of existing catchment initiatives

Externality costs of agriculture ignored

Water customer (public), not the polluter pays

Water company bears risks of catchment quality failures and
variable flows

Water companies do not own catchments

Biodiversity seen as an add on

Fragmentation of Sustainable Upland Values

Economic

- Hydro-electric
- Tourism
- Agriculture
- Rural
Development
- Flooding

Environmental

- Biodiversity
- Landscape
- Water Quality
- Water Storage
- Water Distribution

Social

- Quality of Life
- Leisure &
Recreation
- Sport
- Health

Managing Water & Biodiversity

User-based sectoral approach

Different sectors use different systems and scales:

Biodiversity - site & species designations

Landscape - national & local

Recreation - market based & social good

Water - quality, quantity, cost, sustainability

Value systems are not transferable (rarely economic)

Most water functions & processes cross over

Underlying issue of interface between upland and lowland value systems

No “location” for consensus building & conflict resolution

Current Issues for Downstream Water Management

Upland Catchment land management is key

- Drainage
 - Pasture management
 - Forest management
- Impacting on hydrology and sediment delivery
- Impacting on water quality



Why Biodiversity Matters in the Catchment Context?

Ecosystems Goods and Services - **tourism, agriculture**

Ecosystem Functions - **water quality, flood storage**

Genetic Resources - **gene pool, subspecies, races**

Political - **WSSD, Ramsar, UKBAP**

Legislative - **E U Directives, CROW Act**

Moral - **corporate responsibility, individual actions**

Catchment Management & Biodiversity

- why it matters to Northumbrian Water

**Integral part of Sustainable Development Agenda for
Business**

Protection of our main resource

Customer priority & partner priority

Role as landowners - managing biodiversity

Community involvement (LA21, LBAPs)

**Increasing stakeholder pressure - government,
shareholders, local authorities, financial institutions,
environmental bodies**

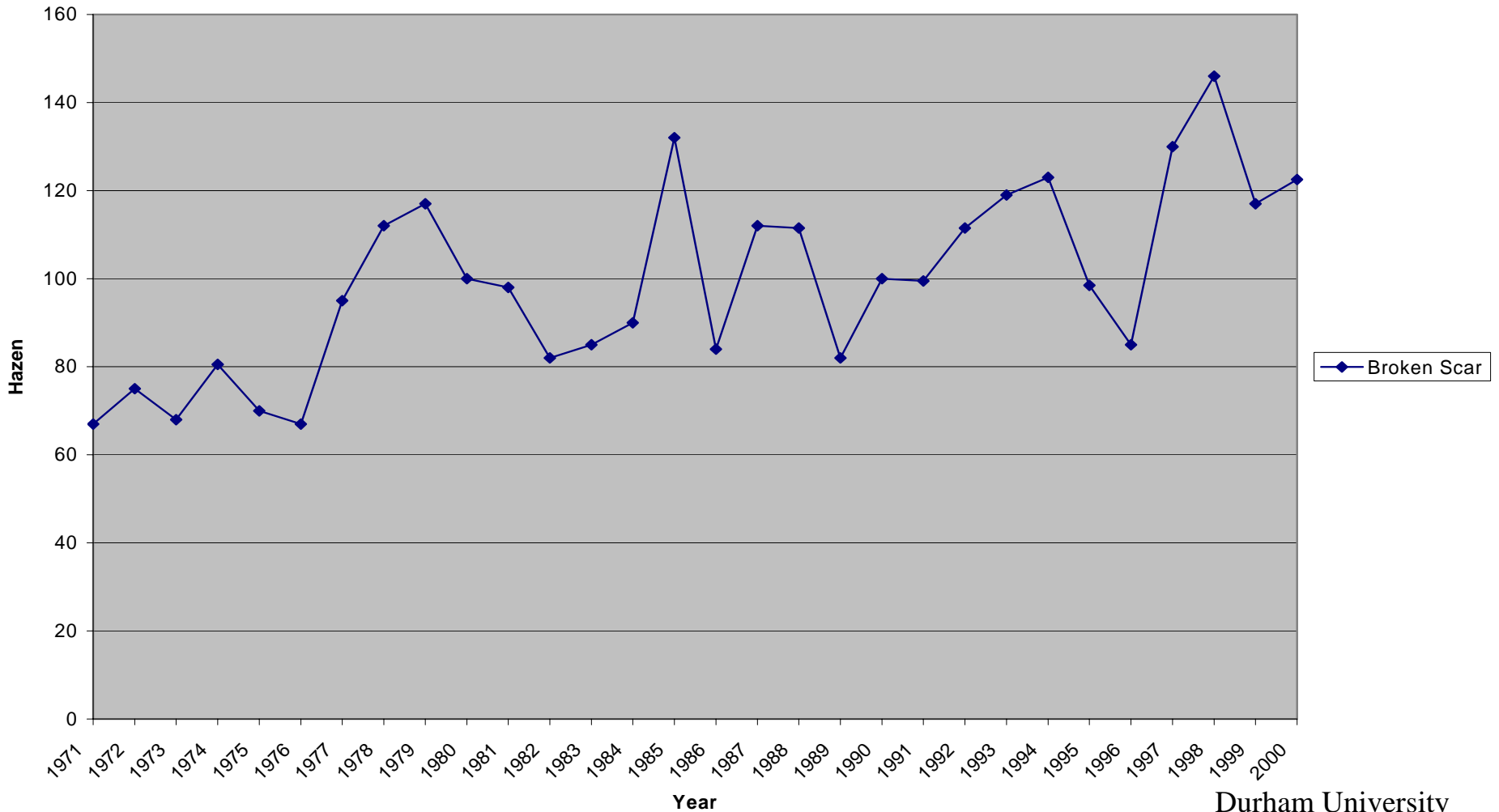
Brand reputation

Management of Water Quality Issues - values, costs & benefits unrecognized

Water colour in the Pennine
uplands and river Tees



Water Colour River Tees, Darlington



Tees Catchment Wetland Management & Water Colour

- Northumbrian Water experiencing growing problem of rising water colour in raw water
- Colour levels increasing not related to flows
- Colour influenced by drought & temperature conditions
- Widespread phenomenon across uplands
- Standard short term response to treat at end of pipe
- All costs to customer (regulated)

Pennine Uplands - Wetland Management & Biodiversity

MAFF grant aid 1950's - 1980's for upland drainage

Perceived benefits

- reduce soil wetness - improved vegetation, agriculture and shooting**

Apparent impacts

- little effect on area moisture retention of peat & veg productivity**
- loss of young grouse & waders, sheep & lambs**
- loss of hydrological integrity of peat layer**
- major erosion of peat, mineral salts & subsoil's**
- flash flooding from increased runoff**
- increased siltation in wet times, reduced flow in dry periods**
- direct loss of 'locked' carbon from 'sinks'**

Moor Gripping Restoration - English Nature



- Block grips - Raby Estates, Cow Green, Hexhamshire
- Colonised by vegetation
- Water flow halted
- Benefits to stock & birds
- Erosion & flooding reduction

Pennine Uplands - Water Management Framework

Issues	Lead Agency	Practical Implementation	Incentives & Controls?	Value Planning System
Biodiversity	EN	Landowners/LBAP	EN	Site based designations
Water Quality	EA	NW/EA	EA/DWI	EA Quality objectives
Water Resources	EA	EA/NW	EA	CAMS
Flood Prevention	EA	EA/Landowners	EA	EA Policy
Soil Erosion	DEFRA	Landowners		Soil classification
Landscape	C.Ag	Landowners	Planning	AONB designations
Recreation	SpC	NW/Landowners	Planning	market, public good
Hydro-electric	NEI	NW	EA	market based
Drainage	DEFRA	Landowners		
Tourism	NTB	Landowners	Planning	market based

Partnerships key to implementation

Sustainable Management Challenge for Water Colour

- Land Managers
 - Costs & Benefits
- Water Customers
 - Benefits & Costs



Biodiversity, flooding, water quality, soil erosion, recreation, tourism, hydro-electricity, water resources - need to identify 'capital' flows to and from Uplands

Sustainable Water Vision

- **Long term decision making** - PR04 5 year horizon only
 - Local authority elections
 - government policies
- **Stakeholder Dialogue** - avoid the sectoral silos, recognize diversity of values
- **Improved knowledge base** - impacts and flows
- **Recognize need for equitable sharing of benefits**
- **Full cost recovery** - polluter pays
- **Cost/Benefits addressed across all sectors**
- **Holistic mechanism for planning, management & delivery**
- **Political institution at catchment level to integrate and resolve**
- **Tools for defining values, analysis and decision making**

How far have we got to go?

Water Framework Directive addresses key issues such as:

- **Management - river basin as basic unit for management & planning**
- **Institutional reform- one competent authority**
- **Environmental definitions - ecological status**
- **Surface water & ground water included - diffuse pollution**
- **Economic analysis of water use - full cost recovery**

How far have we got to go?

Outstanding Challenges

- Valuing the resource - systems & tools
- Long term planning - roles?
- Conflict resolution and priorities - value judgements
- Using & improving scientific knowledge
- ‘Rewarding’ the “upstream” managers
- Identifying the new ‘deliverables’ for farming
- Behavioural changes

The Sustainable Catchment Vision

Long term, Stakeholder lead, Partnership Approach

- **Economy** - recognize externalities; polluter pays; modulation opportunities within agricultural subsidies
- **Environment** - biodiversity, water quality, soil health, landscape, recreation benefits
- **Society** - public benefits, community involvement, new role for countryside, reduced flooding