

CMS-CIWEM Conference

Land Use and Water:
planning lessons into practice

November 6th 2007

Economics of Land Use and Ecosystems

Joe Morris

Cranfield University

Schedule

- Sustainable Water Management
- Natural capital and ecosystem services
- Floodplains – suitable case for treatment
- Implications for Policy



Sustainable Water Resource Management

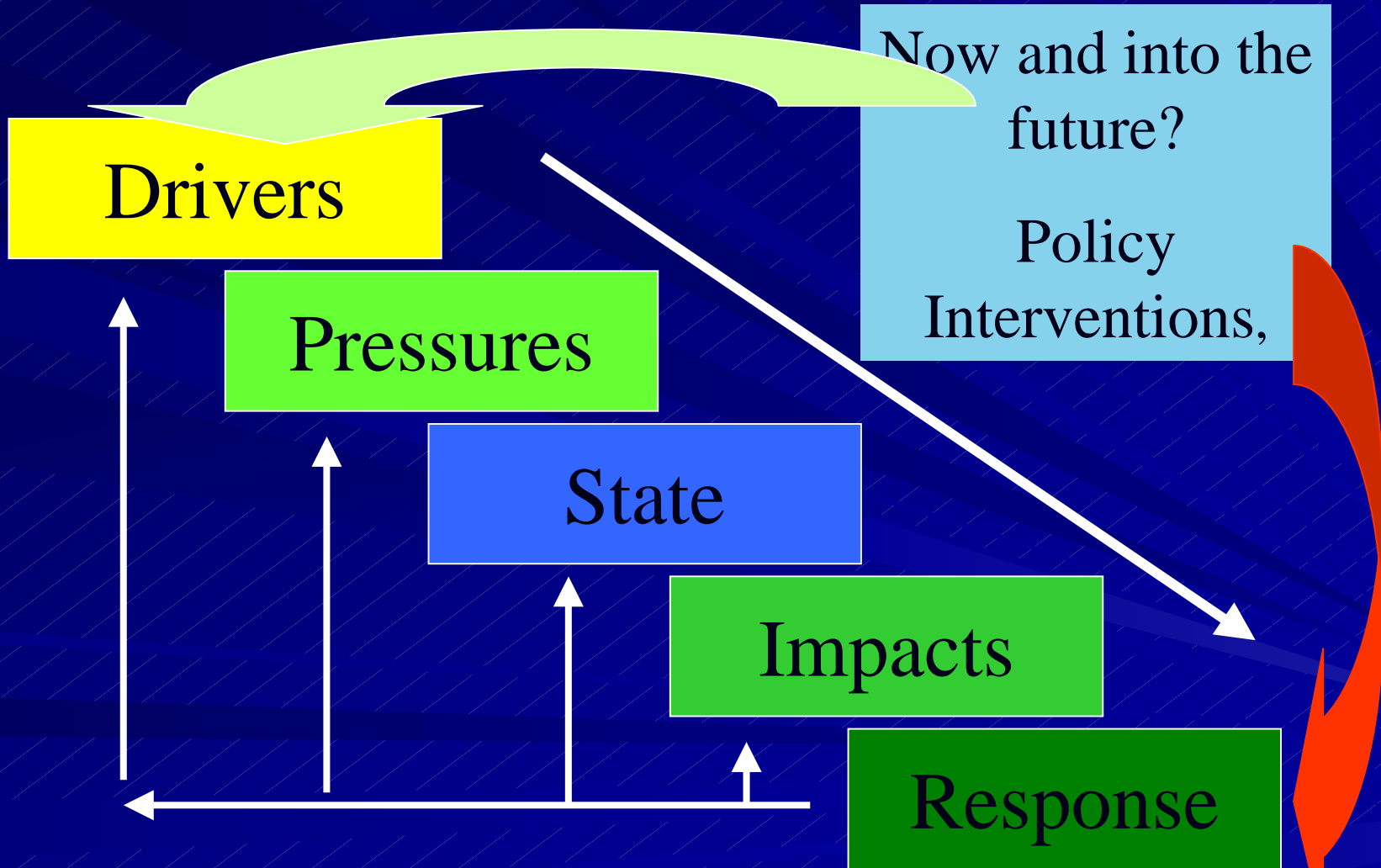
- Overcome pressures on water resources:
 - on water supplies
 - on environment
- Achieve most efficient resource use among existing and new users
- Help deliver sustainable development

Quality
and Quantity

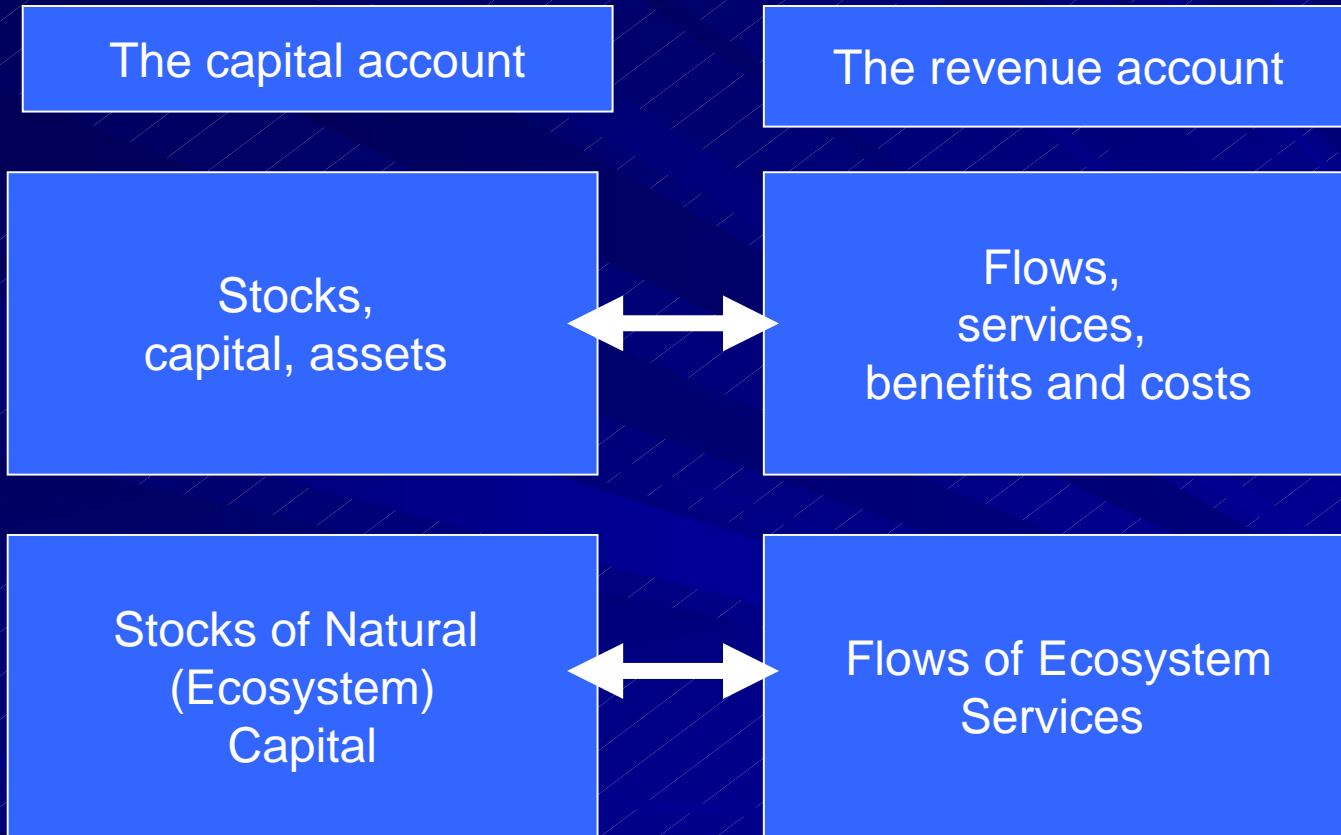


© Orla (David Jaden)

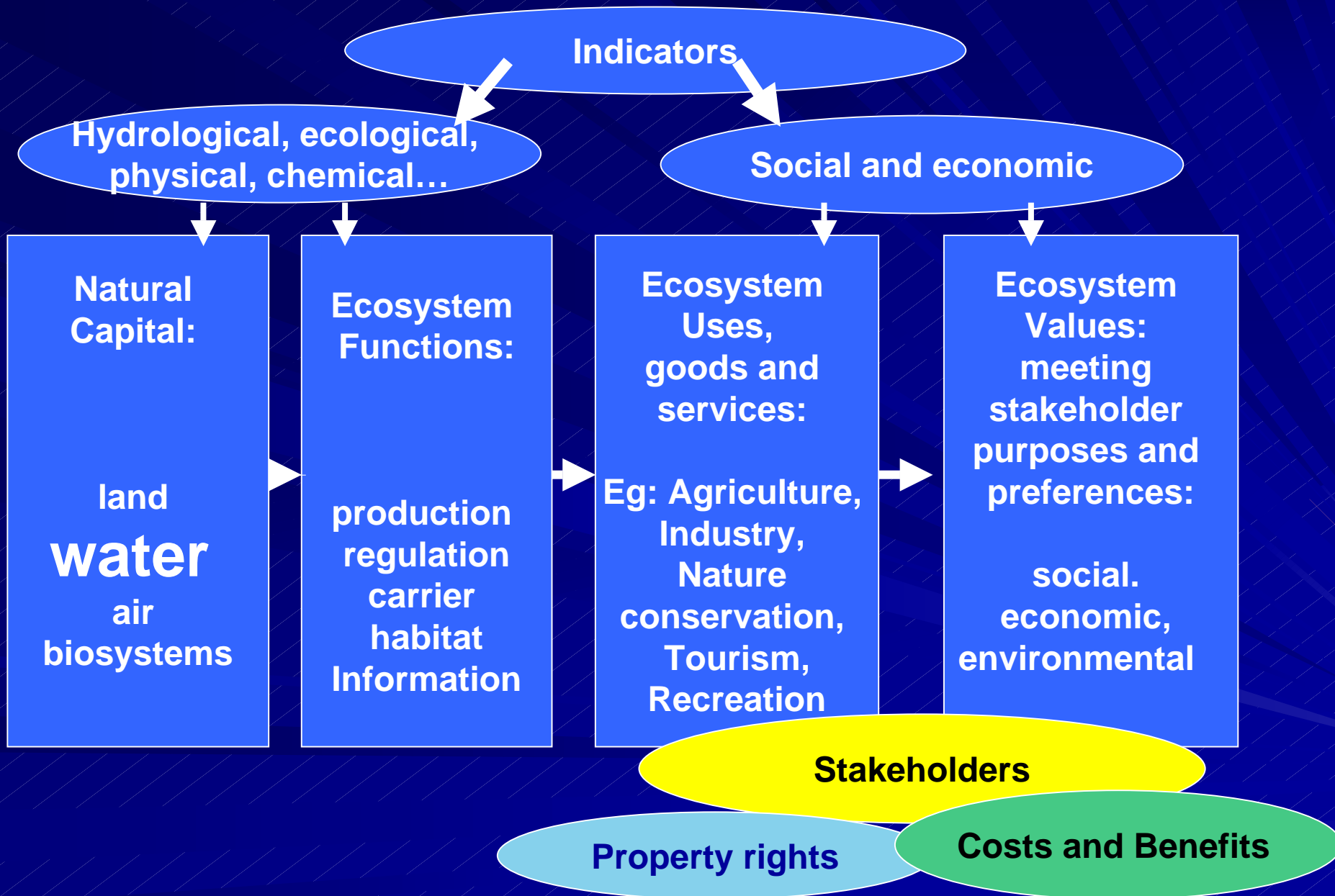
DPSIR Framework



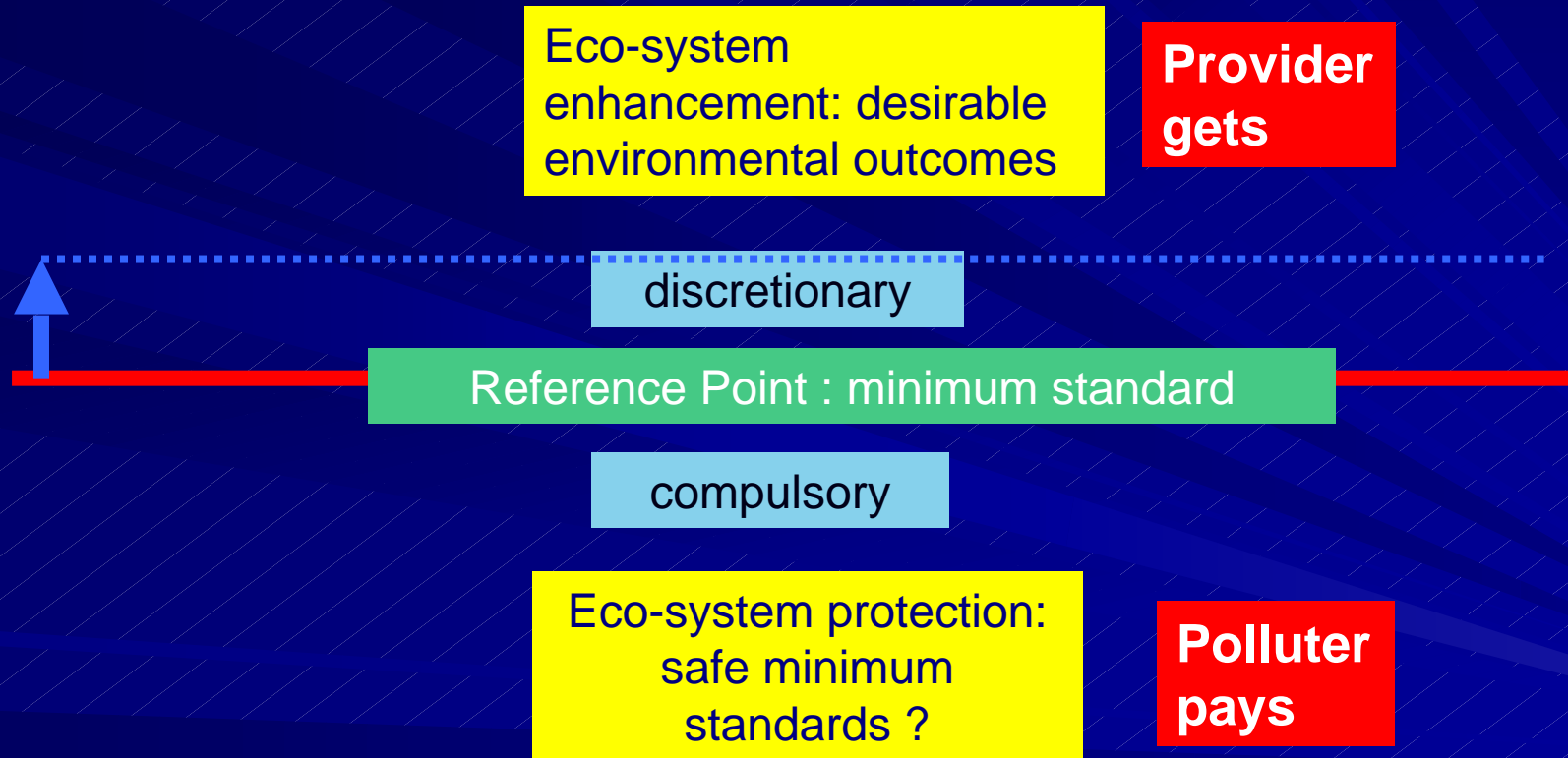
The role of natural capital



Ecosystem Functions, Uses and Values



Reference point for environmental management

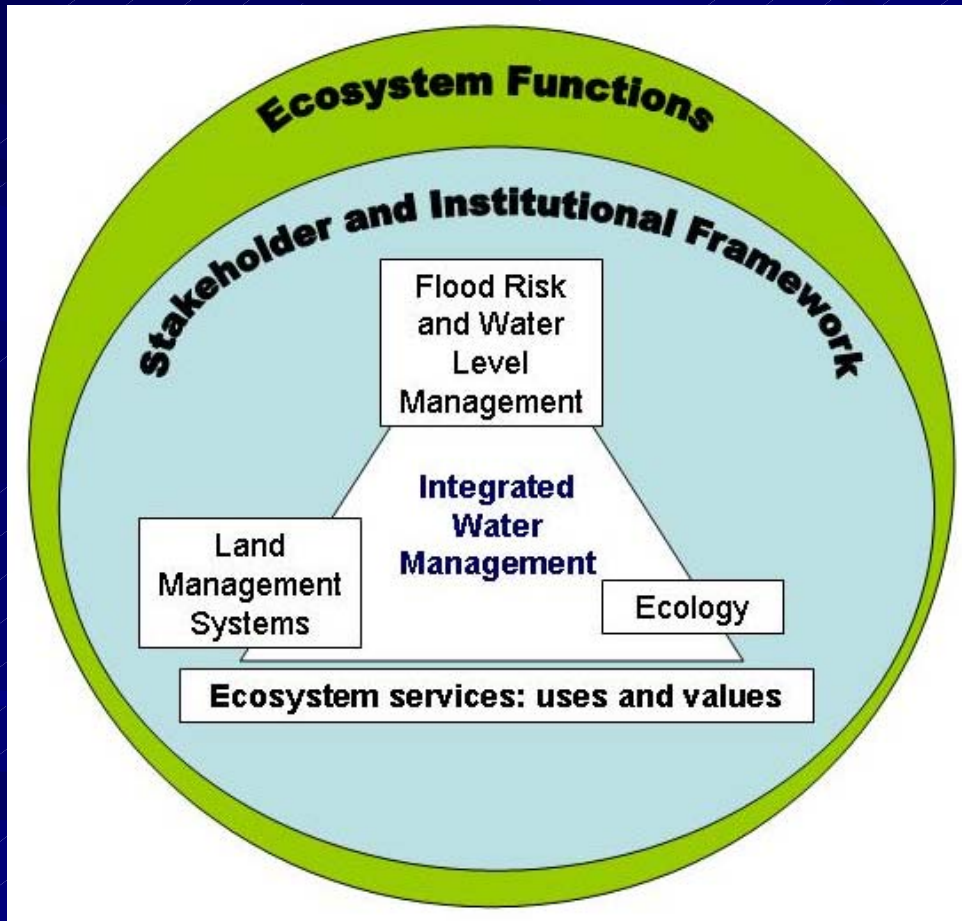


Integrated land and water management: The Case of Flood Plains:

- is it possible to achieve multiple objectives in ways which are appealing to major stakeholders?
- what data bases and appraisal methods are needed to support decision making?
- what are the best ways of achieving widespread adoption of integrated management solutions?



Conceptual Framework : integration



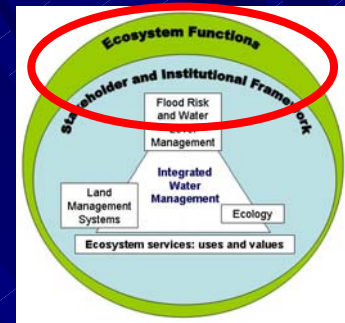
A Case Example: Beckingham Marshes : Notts

History: changing priorities

- prior 1945: grassland & marsh, willow production
- 1960-70: 'improved' drainage, pumps, emergency flood storage
- 1970-2000: arable production
- 2005: RSPB plan re-conversion to grassland for lapwings, increase water table levels

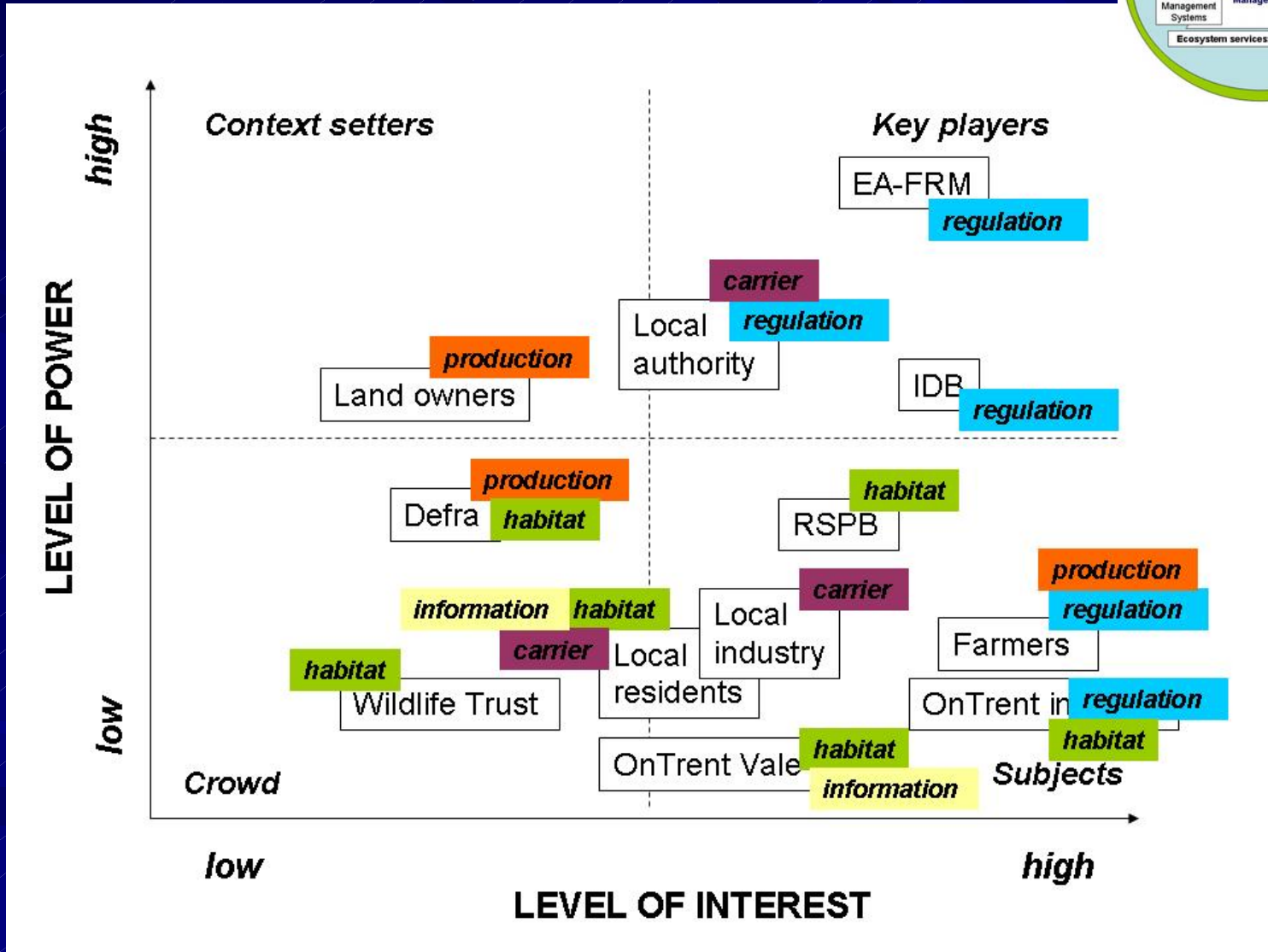
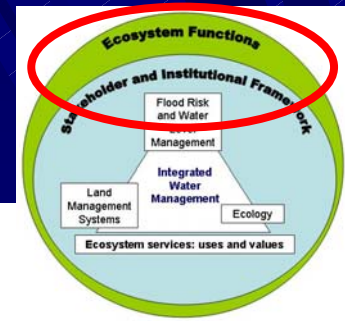


Stakeholder analysis: Beckingham Marshes

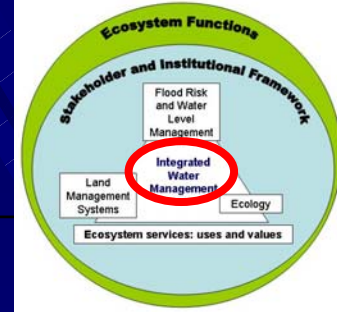


Function	Use	Stakeholders	Values/outcomes
Production	Agricultural production	Farmers, Defra	Economic gains from crop & livestock production
Regulation	Flood water storage, drainage, carbon cycling?	EA-FRM, IDB, farmers, local industry, RSPB	Avoided damage due to flooding, tradeable services
Habitat	Maintenance and enhancement of bio-diversity	RSPB, EA-CONS, OnTrent, Notts WT, local residents	Contribution to BAP targets
Carrier	Transport and settlements	Local residents, local industry, farmers, local authority	Location for housing, roads, local industry: Property and service values, costs of alternatives
Information	Amenity, landscape, recreation, history	RSPB, local residents, local authority,	Enjoyment of the countryside and related benefits: willingness to pay

Beckingham Marshes:



Modelling land and water scenarios*: Beckingham



		Scenarios		
Dominant land use >		Arable farming	Flood storage	Wetlands
Water management regime >		Rapid drainage, low flood frequency	Rapid drainage, high flood frequency	Slow drainage, high flood frequency
Function	Use			
Production	Agricultural production	H	M	L
	Bio-fuel crops	H	L	M
Regulation	Flood water storage	M	H	L
Habitat	Biodiversity target	L	M	H
Carrier	Road network/industry	H	M	L
Information	Recreation	L	L	H
	Education	L	L	H

*Based on monetary values

General Conclusions – drawn from the floodplain

- Policies often characterised by lag, fragmentation, conflict, inadequate targeting, short-termism and missed opportunity
- Policies for SD must be set within an ecosystems framework with explicit links to values
- Multiple ‘sciences’ are needed to understand the trade- offs, synergies and limits involved



General Conclusions – drawn from the floodplain

- **Sustainable solutions require diverse collaborations and long term commitment**
- **Scale, temporal and spatial, is critical**
- **Need a practical framework for joined- up policy management and development planning**
- **Need regional and local ‘experiments’ to show it can make a difference**



- Contact email: j.morris@cranfield.ac.uk
- Project website: <http://www.silsoe.cranfield.ac.uk/iwe/expertise/relu.htm>:
- Selected references:
- Defra (2004) Making Space for Water. Developing a new government strategy for flood and coastal erosion risk management in England. London: Department for Environment, Food and Rural Affairs
- Millennium Ecosystem Assessment (2005). Reports on <http://www.maweb.org/en/index.aspx>
- Morris, J, Bannister, N., Hess, T.M., Gowing, D. J.G., Leeds-Harrison, P. B., Vivash, R., Wade, M. (2004) Integrated Washlands for Flood Defence and Biodiversity, Report to English Nature and Defra. English Nature Research Report Series No. 598. Peterborough: English Nature
- Penning-Rowsell E, Johnson C, Tunstall S, Tapsell S, Morris J, Chatterton J, and Green C, (2006) The Benefits of Flood and Coastal Risk Management. (i) A Manual of Techniques , (ii) . A Handbook. Produced for Defra and Environment Agency. Enfield: Flood Hazard Research Centre, Middlesex University.
- Thorne, C., Evans, E. and Penning-Rowsell, E . (eds) (2006). Future Flooding and Coastal Erosion Risks. London: Thomas Telford