Linking SEEA to Policy

Land and Ecosystem Accounting

Chile Regional Training – April 2015

Project: Advancing the SEEA
Experimental Ecosystem Accounting

United Nations
UNEP
Convention on Biological Diversity
NORWEGIAN MINISTRY OF FOREIGN AFFAIRS

Policy Dirvers

- Sustainability
  - The onging use of natural resources (Land)
- Degredation of natural resources impacts:
  - Who and how – social
  - Flora and fauna – extinction
  - Where and when – timing for management & expenditure
- Thresholds
  - Economic – productive systems failing
  - Ecological – algal blooms

Why land accounting?

- Fundamental asset: **Land**
  - Agriculture - wheat, sheep, crops, etc
  - Parks - tourism, habitat, water
  - Native vegetation - habitat, flora, fauna
  - Forests - wood, paper
  - Lakes - water, fish
  - Urban - people, cities
  - Rivers - fish, water
  - Wetlands - fish, birds, water

Land and ownership/management

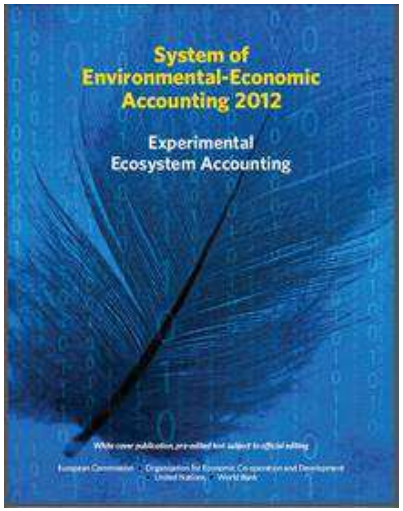
- The owner of the land manages the land
  - Links to economic owner of the land
  - Behaviour of the owner influences what the land produces (goods and services)
- Public policy
  - Urban planning
  - Land use policies
  - Environmental policies
  - Economic polices
    - **ALL influence the behaviour of owners!**

"Behaviour"
Land management and land use

- Management
  - Intensive – highly modified
  - Subsistence – very low modification
- Management and use influence goods and services
  - What goods and services do we want?
  - Is the production sustainable?
  - Are the policies leading to the land use we desire?

System of Environmental-Economic Accounting

- Central Framework
  - Accounting: measuring and recording water and energy use, emissions, discharges, environmental expenditure, environmental taxes
  - **LAND ACCOUNTS**
- Experimental Ecosystem Accounting
  - Builds on the Central Framework
  - **ECOSYSTEM ACCOUNTS**



Key aspects of the framework

Statistical units

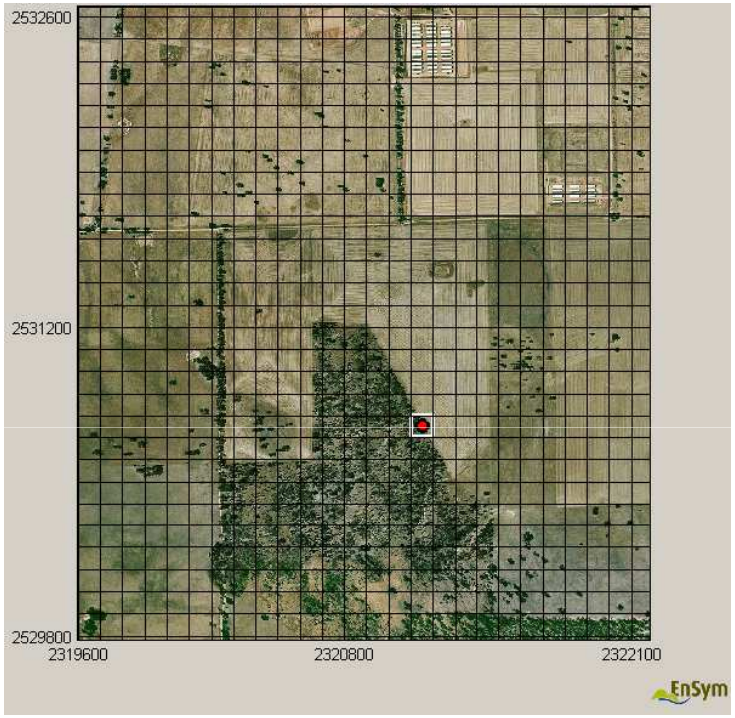
Classification of ecosystem services

- Provisioning (water, materials, energy and other provisioning services)
- Regulating services (remediation and regulation of biophysical environment, flow regulation, etc.)
- Cultural services (physical or experiential use of ecosystems

Ecosystem assets

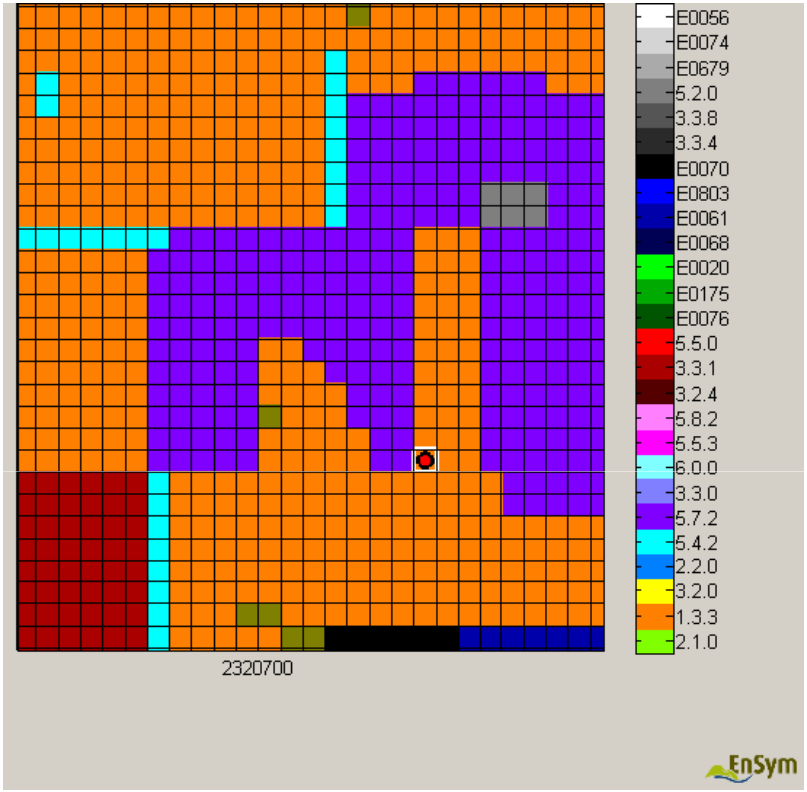
- Ecosystem extent
- Ecosystem condition (measured through a range of indicators of characteristics)
- Expected ecosystem service flows

Degradation and enhancement



Geography

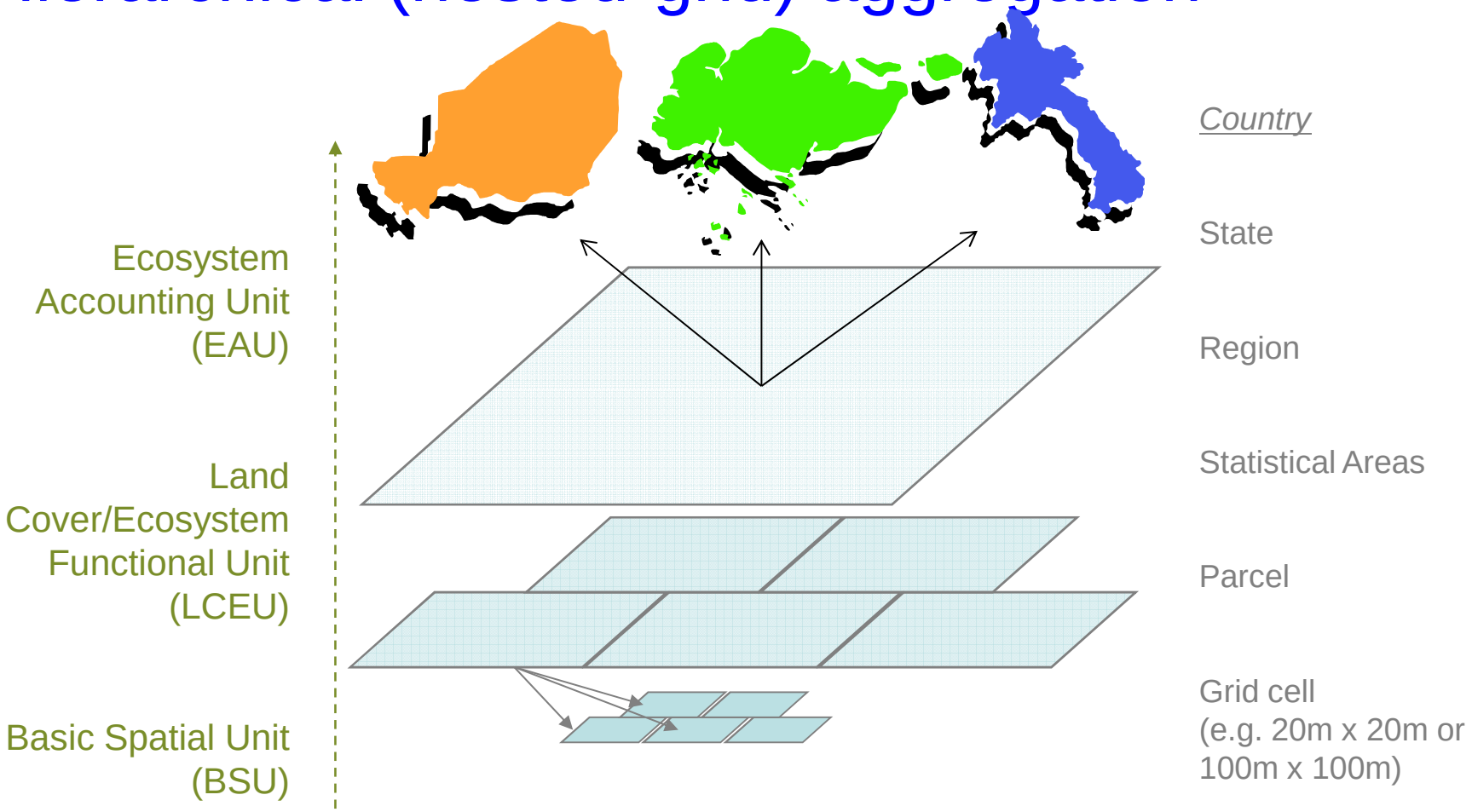
Building analytical capability for units and ensure that GIS standards are maintained



Accounting

e.g. unified and hierarchical classifications and variables for units (grid)

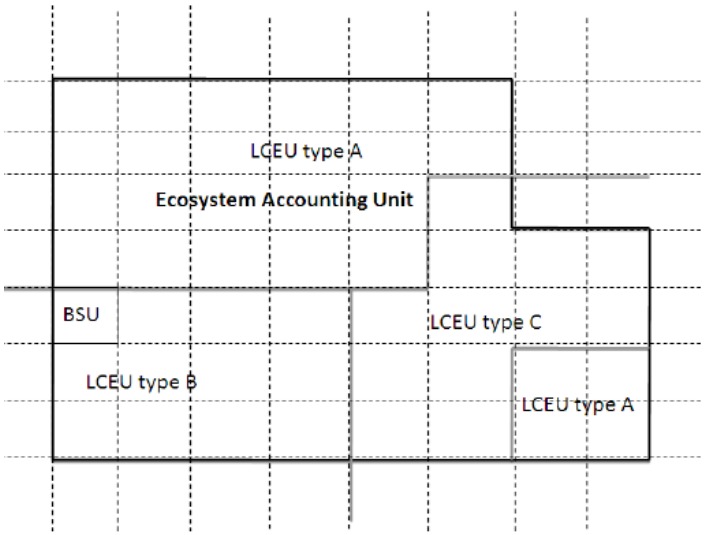
Hierarchical (nested-grid) aggregation



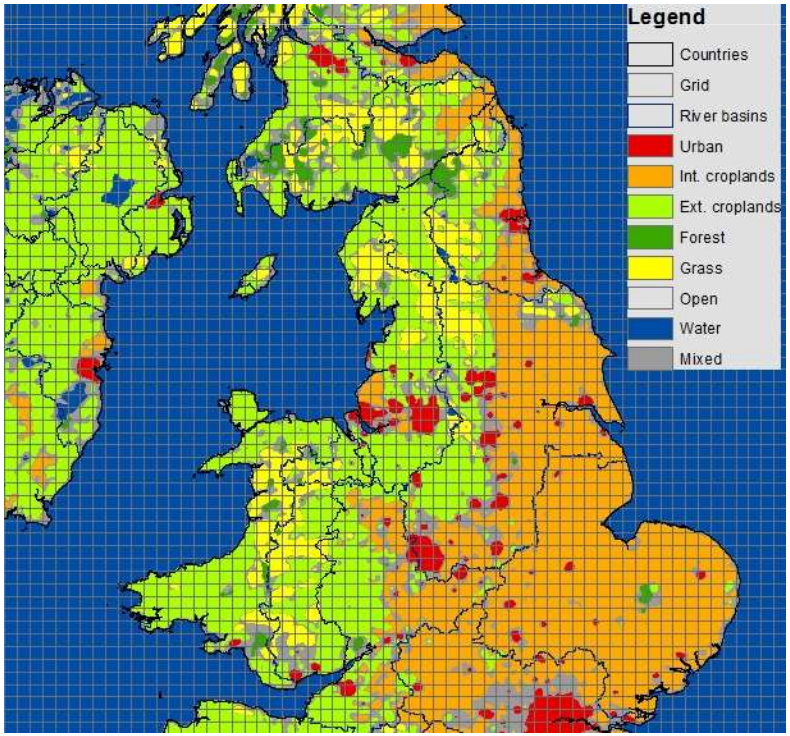
Spatial data perspective: harmonizing reporting units

- Measurement units for social, economic and environmental parameters remain untouched
- New accounting and reporting units created for ecosystem accounting purposes

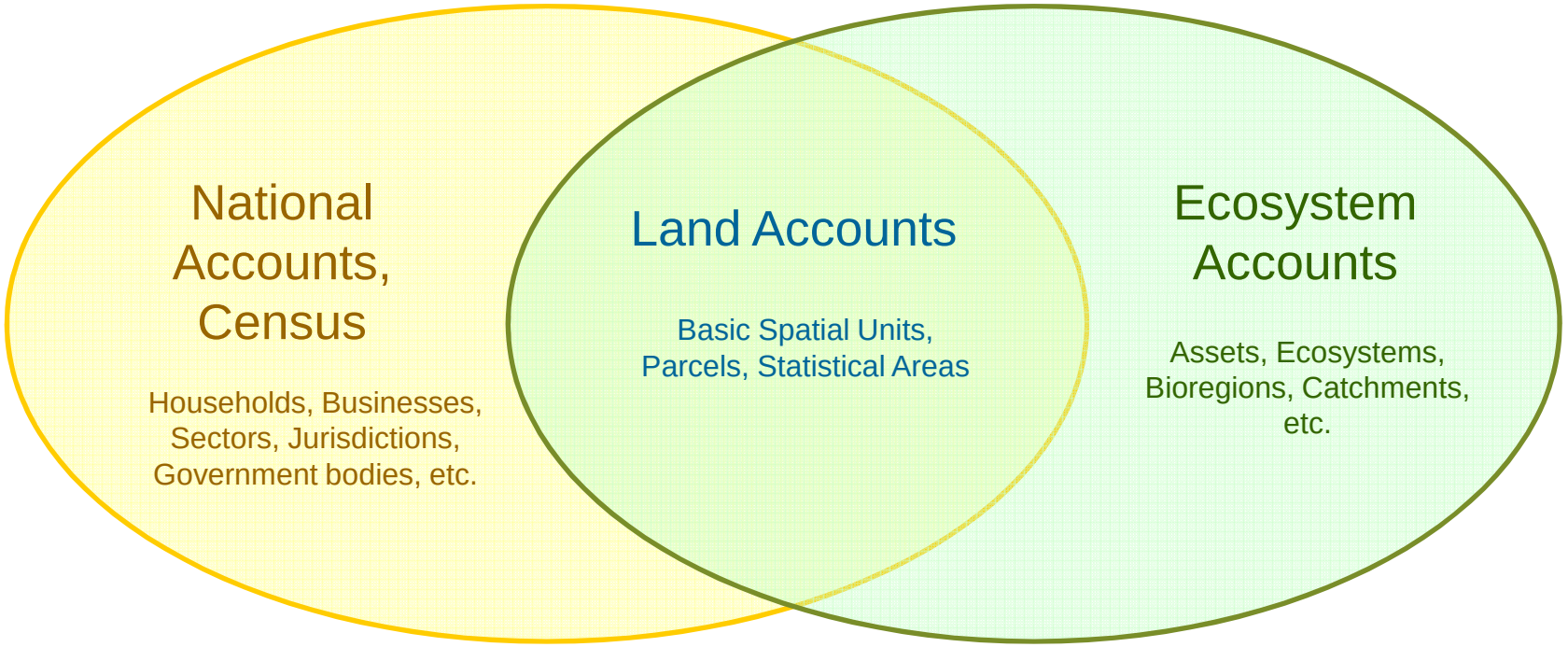
Stylised depiction of relationships between BSU, LCEU and EAU



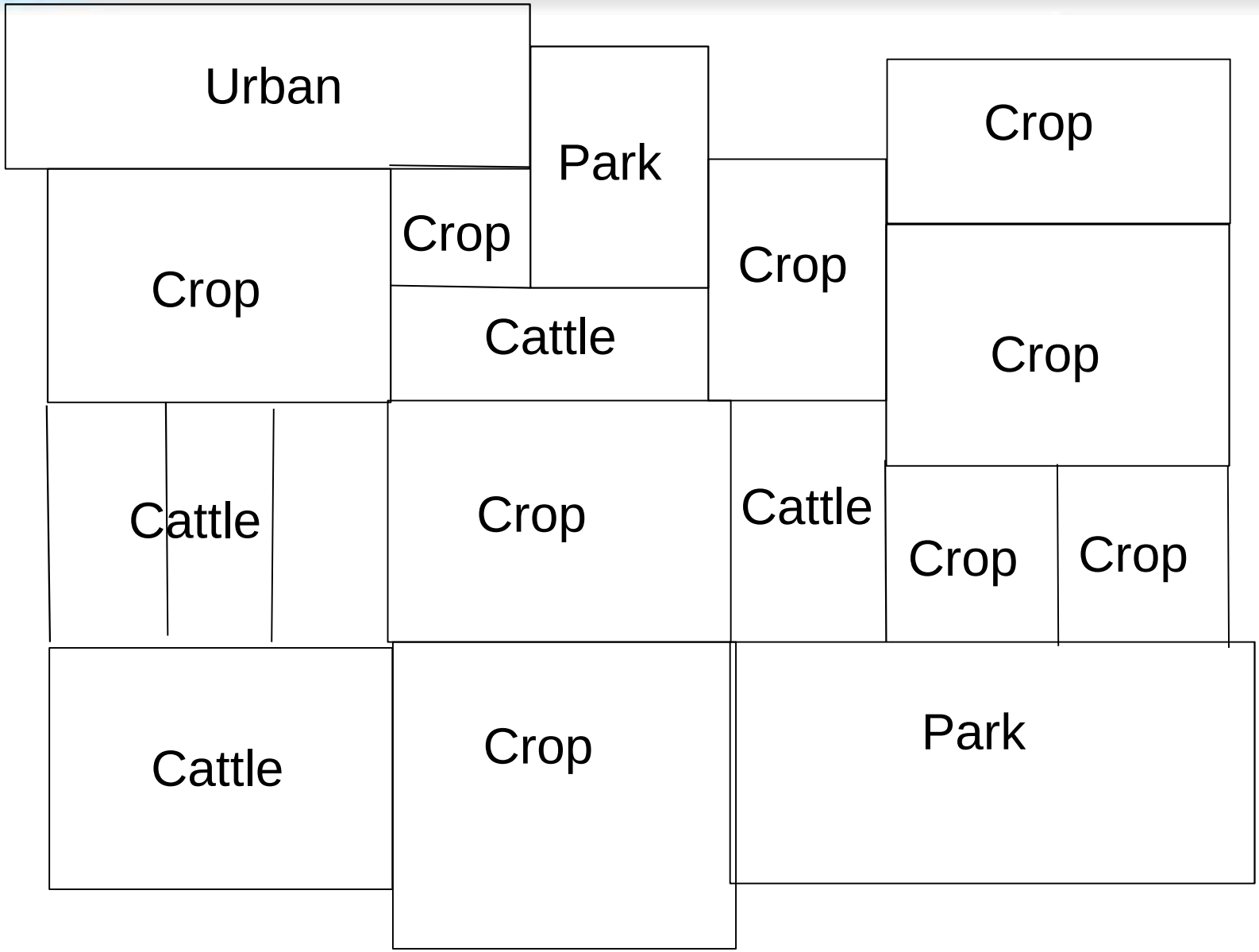
Overlay of units (UK)



Common units for integration



Integrated Environmental-Economic Accounts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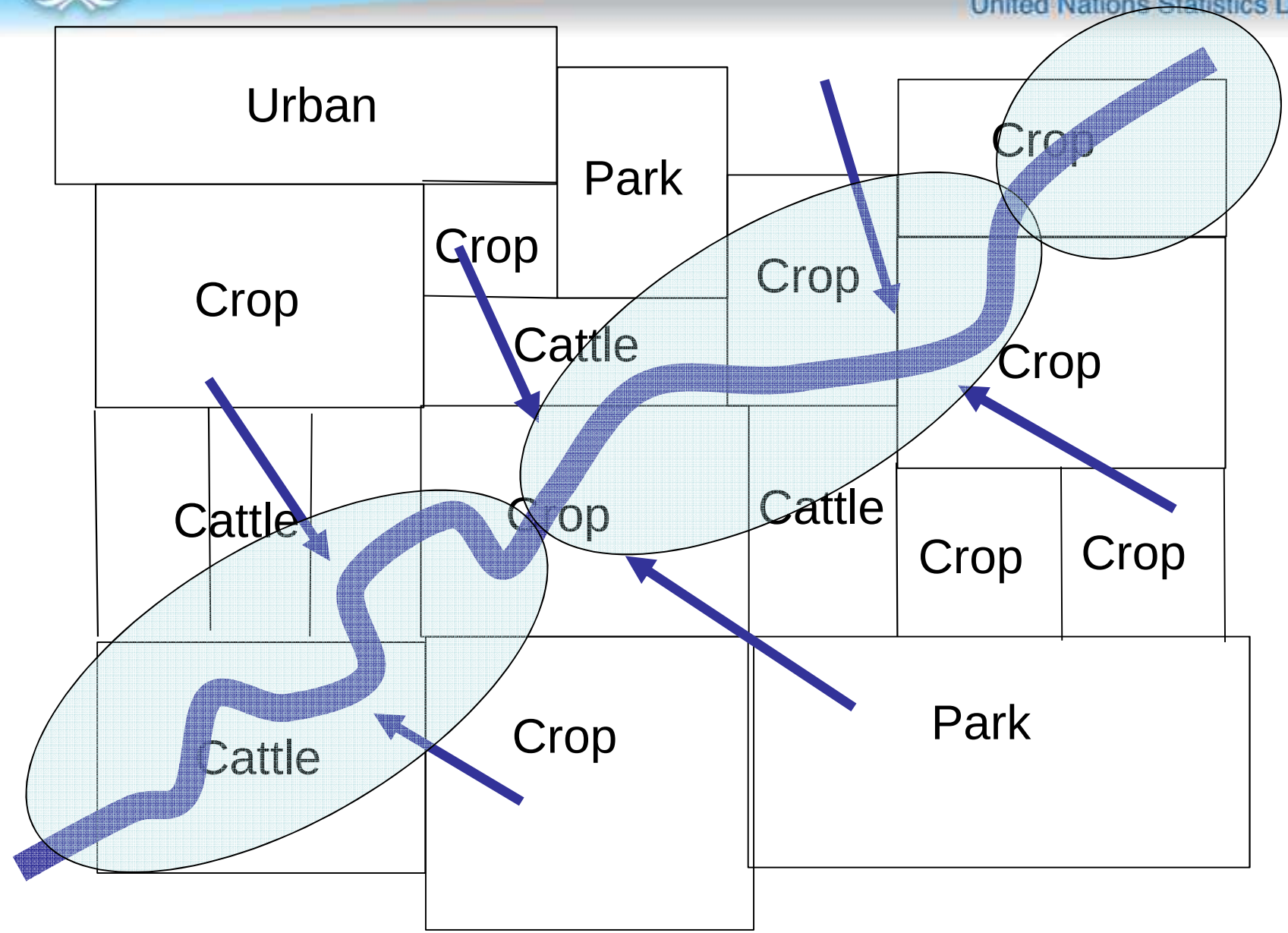
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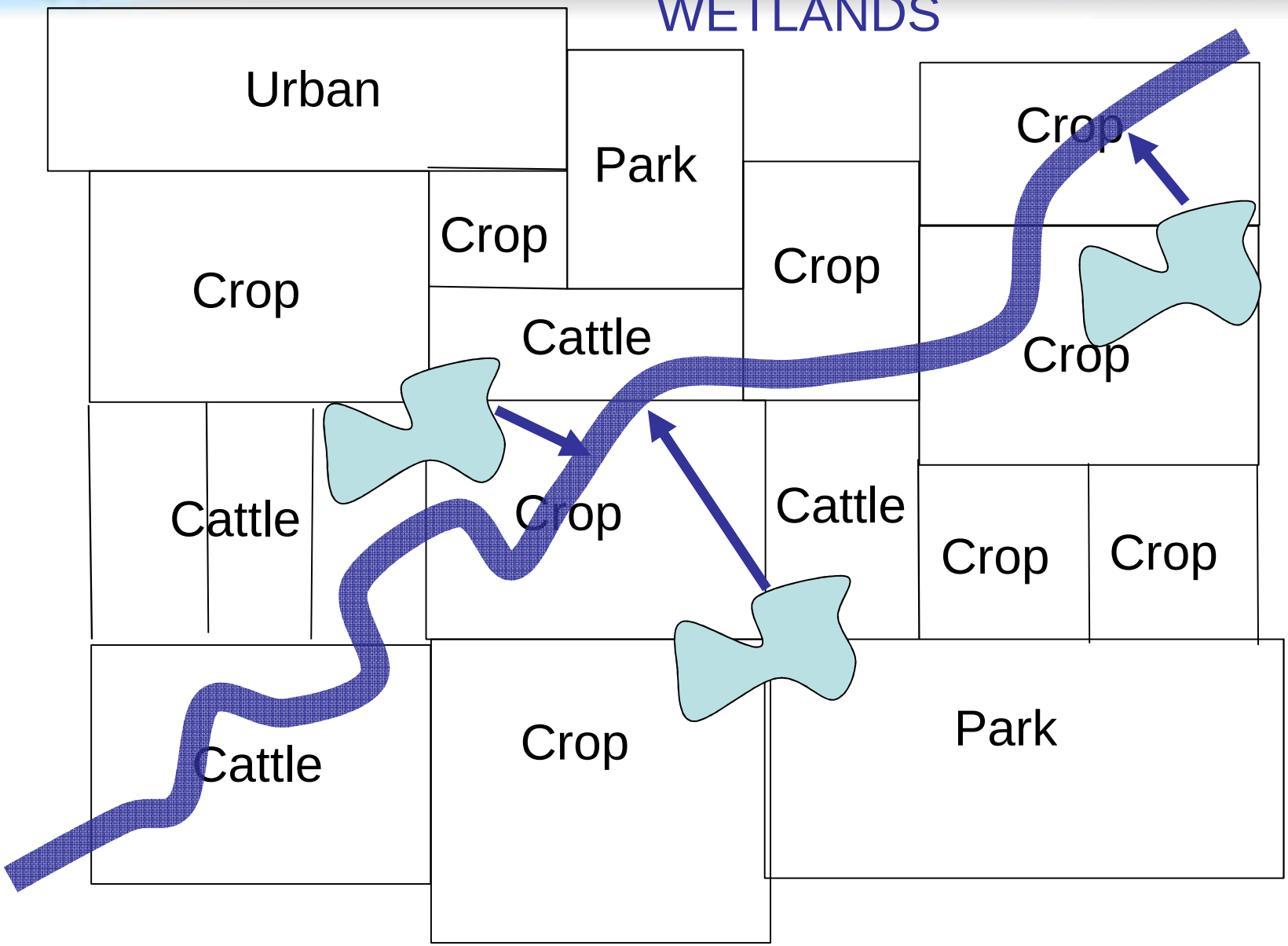
WETLANDS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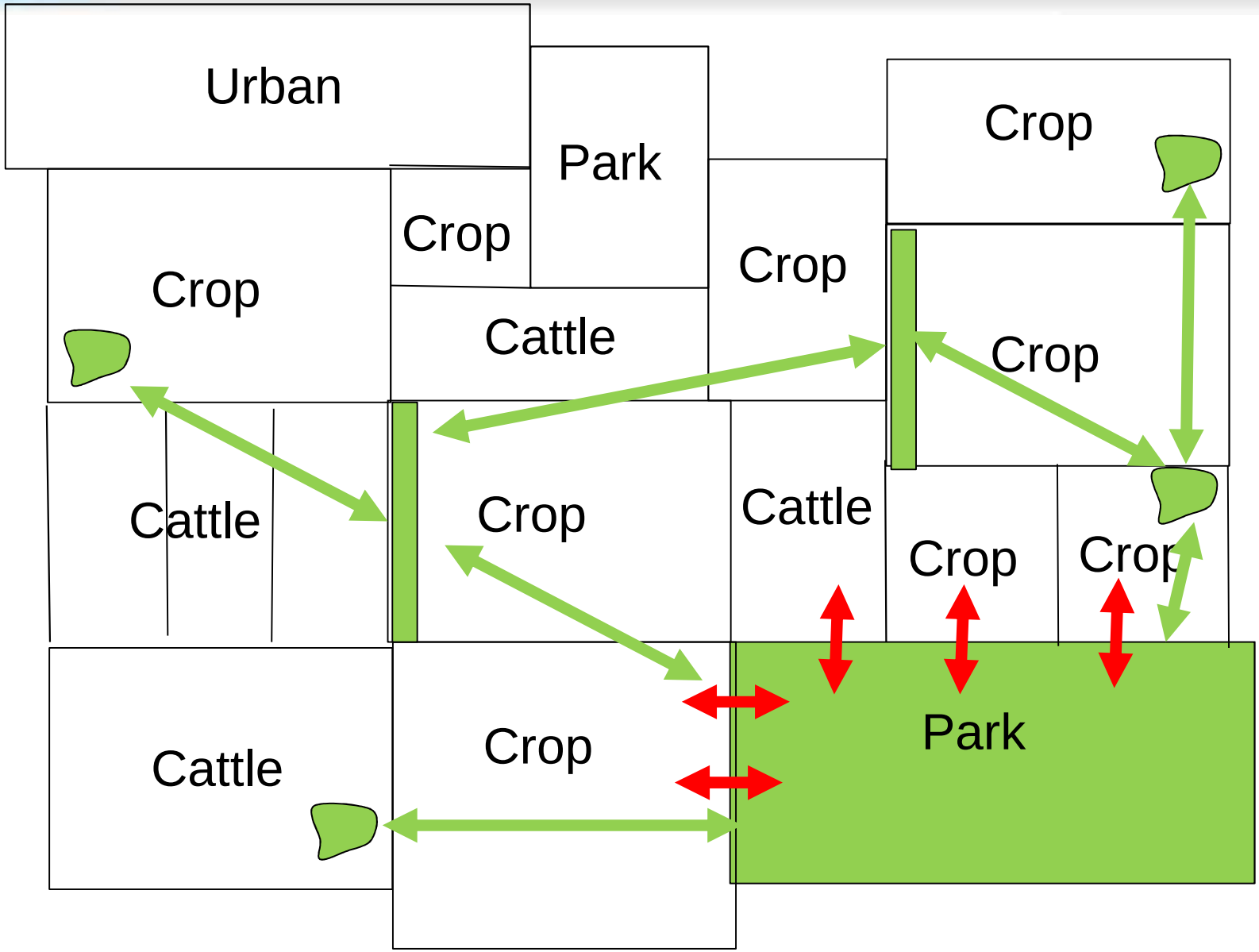
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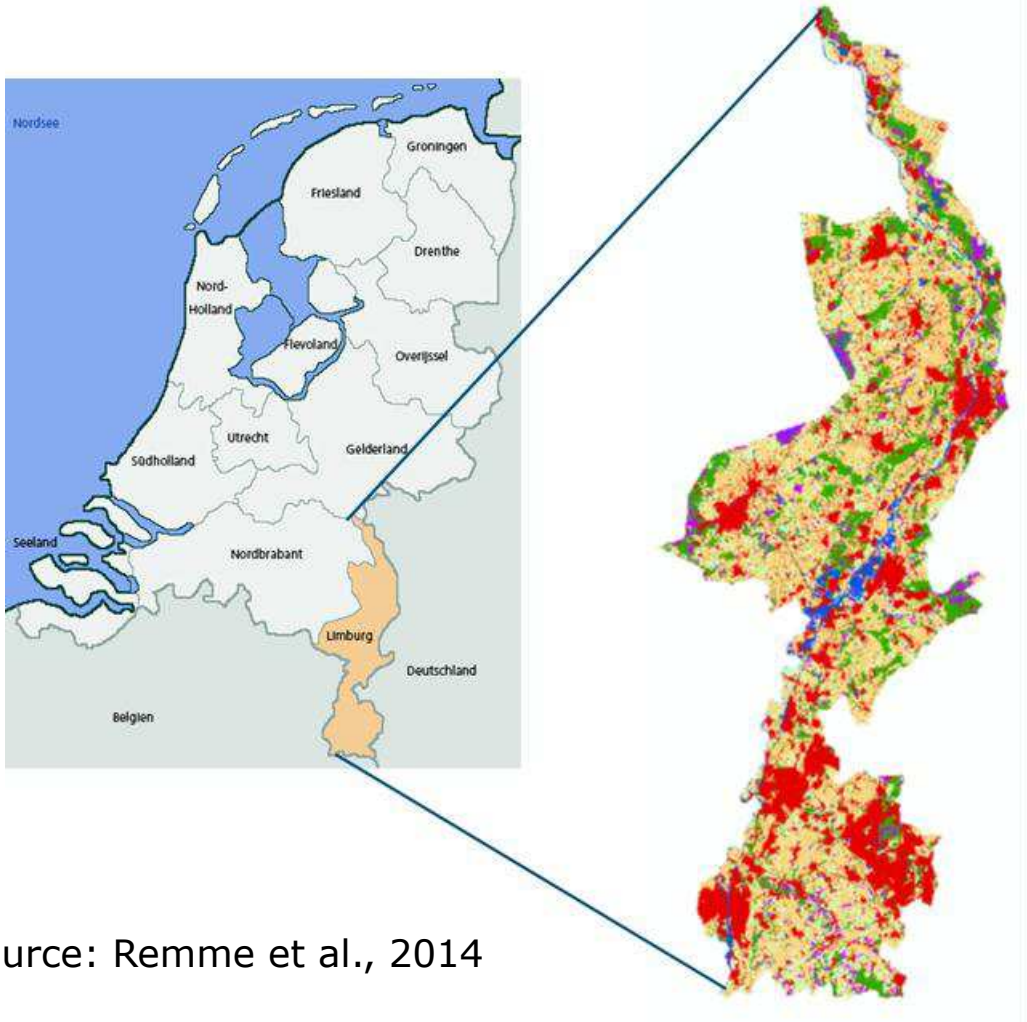
Ecosystem Assessment - Policy

- Condition
  - reflects the health of the ecosystem
- Capacity
  - reflects the capacity of the ecosystem to generate ecosystem services, now and in the future
- Ecosystem services
  - the contribution of the ecosystem to a benefits, e.g. the production of goods for consumption

Ecosystem regional production : Limburg

- Biophysical ecosystem account developed for Limburg Province, the Netherlands
- 2200 km^2, 1.1 million inhabitants
- Analysis of 8 ecosystem services



Source: Remme et al., 2014

LCEU	Ecosystem service													
	Crop production		Fodder production		Drinking water extraction		Hunting		Air quality regulation		Forest carbon sequestration		Recreational cycling	
	Total	Mean (SD)	Total	Mean (SD)	Total	Mean (SD)	Total	Mean (SD)	Total	Mean (SD)	Total	Mean (SD)	Total	Mean (SD)
	Mtons MEQ	kg MEQ ha^{-1} yr^{-1}	ktons dm	kg dm ha^{-1} yr^{-1}	10^3 m^3 water	m^3 water ha^{-1} yr^{-1}	kg meat	kg meat km^{-2} yr^{-1}	tons PM_{10}	kg PM_{10} km^{-2} yr^{-1}	ktons C	kg C ha^{-1} yr^{-1}	10^3 trips	trips ha^{-1} yr^{-1}
Pasture	-	-	521	12,041 (1,573)	9,110	3,099 (2,231)	9,100	21 (17)	405	911 (532)	-	-	1,872	103 (78)
Cropland	2.46	36,314 (1,785)	-	-	14,855	3,082 (2,422)	14,732	20 (17)	715	956 (534)	-	-	2,631	99 (73)
Forest	-	-	-	-	4,577	3,214 (2,624)	8,100	24 (20)	686	2,040 (1,221)	55	1,563 (263)	1,472	126 (94)
Water	-	-	-	-	3,289	9,460 (3,698)	-	-	40	624 (569)	-	-	147	110 (92)
Urban	-	-	-	-	7,862	4,321 (3,527)	-	-	285	547 (562)	-	-	2,735	70 (57)
Heath	-	-	-	-	219	1,293 (821)	678	32 (25)	45	2,062 (1,111)	-	-	30	82 (59)
Peat	-	-	-	-	0	0 (0)	70	13 (3)	7	970 (345)	-	-	3	92 (44)
Other nature	-	-	-	-	1,187	3,093 (2,567)	1,513	25 (20)	69	1,155 (710)	-	-	226	128 (93)
Provincial total	2.46		521		41,099		34,193		2,252		55		9,116	

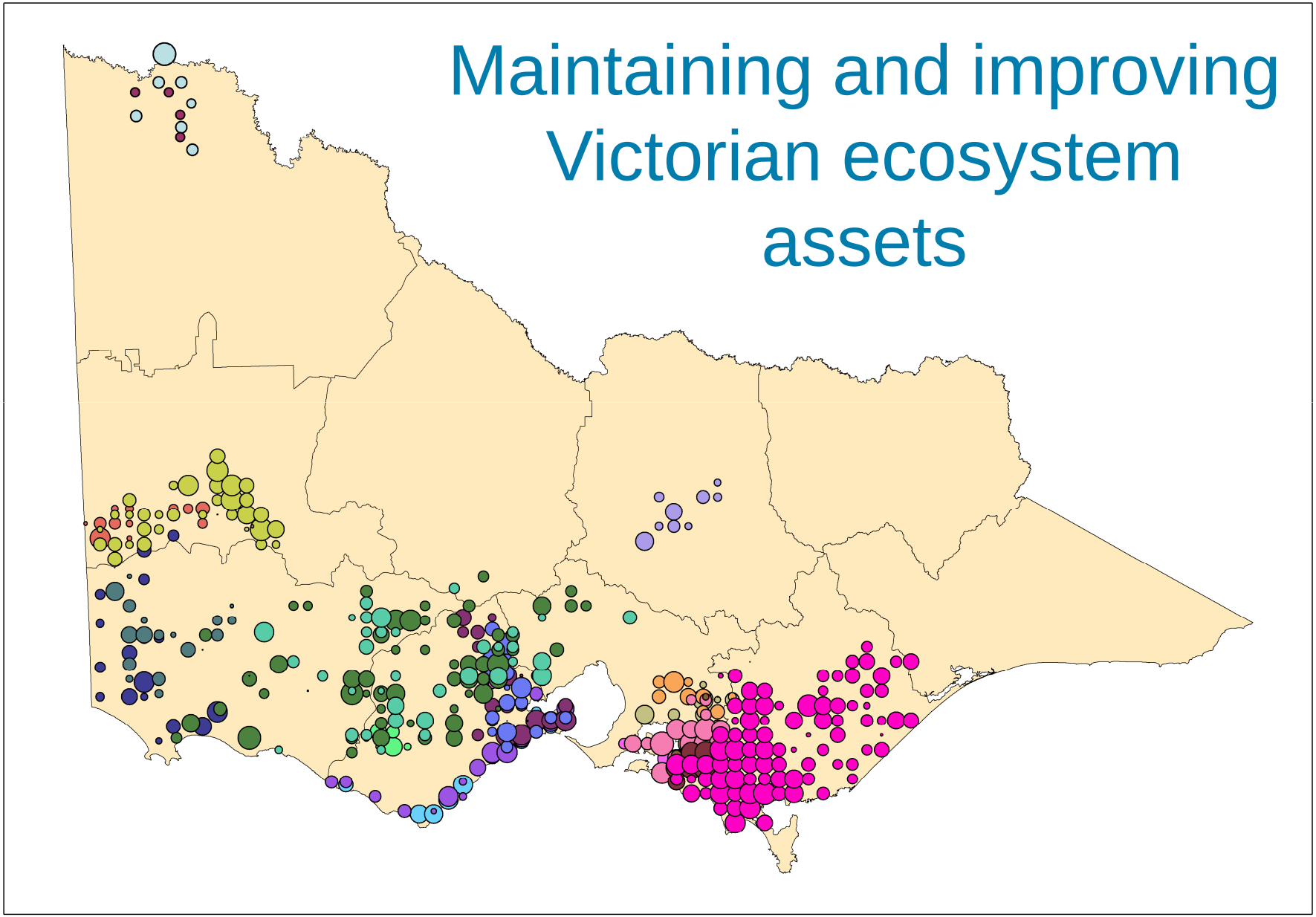
Source: Remme et al., 2014

Australia - Victorian Experimental Accounts

- Link with ABS Experimental Land Accounts
  - Land Value, Production, Ownership and management, Demographics
- Ecosystem classification & condition
  - Native Vegetation Information System (HH)
  - Wetland system type and origin (IWC)
  - River reaches (ISC)
- Reporting units
  - Watersheds, Bioregions, SA4 (ABS)
- Linked to government payments
  - Change in land classifications, ecosystem condition & services

Eigenraam, M., Chua, J. & Hasker, J. (2013). *Environmental-Economic Accounting: Victorian Experimental Ecosystem Accounts, Version 1.0*. Department of Sustainability and Environment, State of Victoria

Maintaining and improving Victorian ecosystem assets



Environmental Benefits Index (EBI)	Agriculture	Forestry	Aquaculture	Use of built up and related areas	Land used for maintenance and restoration of environmental functions	Other uses of land	Land not in use	Total
Annual EBI Flow to 30 June 2010	271,304,904							271,304,904
Increase in EBI flow due to:								
Improved management					35,855,034			35,855,034
Reclassification					270,155,361			270,155,361
Reduction in EBI flow due to:								
Natural losses	(84,838)							(84,838)
Reclassification	(270,155,361)							(270,155,361)
Annual EBI Flow to 30 June 2015	1,064,706				306,010,395			307,075,101
Change in annual flow								***35,770,196***

Policy: Ecosystem Accounting

- Evidence base for policy making
- Evidence to report on policy success
- Link policy > environment > income
  - Local, regional, state, national…….
- Social drivers and environment
  - Health, tourism, culture etc