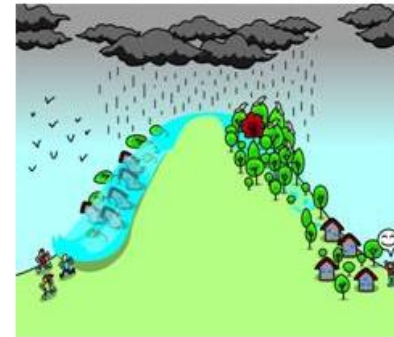


Slovenský koncept k ekosystémovým službám na základe požiadaviek Stratégie EÚ pre biodiverzitu do r. 2020



Branislav Olah

**Fakulta ekológie a environmentalistiky
Technická univerzita vo Zvolene**

Biodiverzita a financie...

“Nakoľko národné účty sú založené na finančných transakciách, nezapočítavajú nič pre prírodu, ktorej nedlhujeme z hľadiska platieb **nič**, ale ktorej dlhujeme z hľadiska zachovania života **všetko**.”

(Bertrand de Jouvenel, 1968)

Prírode skutočne nedlhujeme vo finančnom zmysle nič, ale degradáciou ekosystémov a znižovaním biodiverzity vytvárame **dlhy** pre budúce generácie.

Neprirátavajú sa tieto ekologické dlhy ku bežným dlhom súkromným aj verejným)? Dlhom, ktoré raz budú musieť byť **splatené**?

Nemal by preto medzinárodný a národný **finančný systém** zaúčtovať ekologické dlhy ku bežným dlhom?

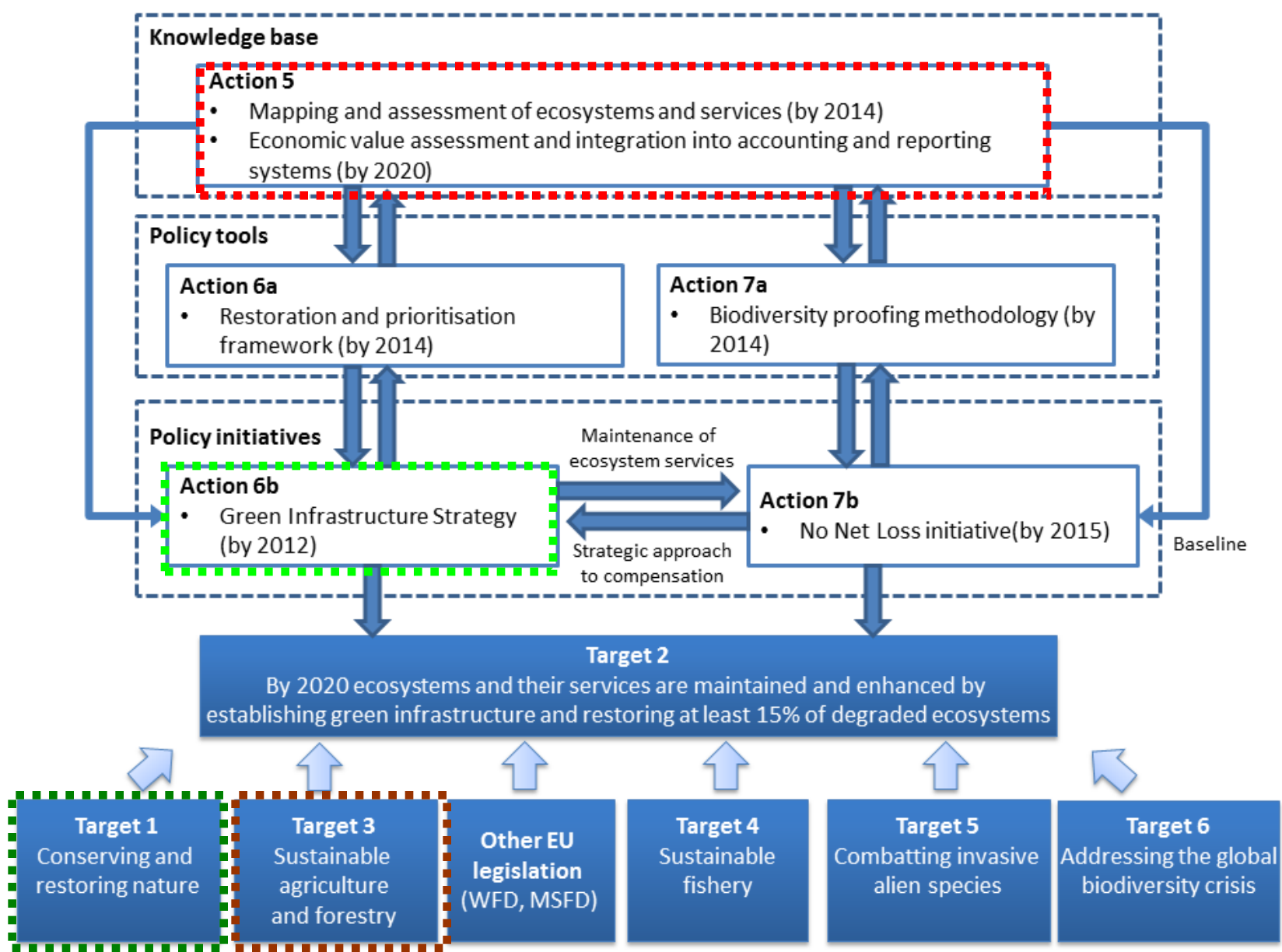
Prečo **ekosystémové služby**?
kapitál?
účtovníctvo?



Jedine komunikáciou v **rovnakom jazyku** ako národné účty získajú environmentálne a sociálne záujmy rovnakú pozíciu

The **EU Biodiversity Strategy to 2020** headline target adopted by EU Heads of States and Governments:

*"Halting the **loss of biodiversity** and the **degradation of ecosystem services** in the EU by 2020, and **restoring** them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss"*



Význam aktivity 5 vo vzťahu k ostatným podporným aktivitám v ciele 2 a ostatným cieľom Stratégie EÚ pre biodiverzitu do r. 2020.

Aktuálne priority

Mapovanie ekosystémov (výskyt a stav)

Mapovanie ekosystémových služieb (meranie, modelovanie, indikátory)

Ekonomické hodnotenie ekosystémových služieb (v biofyzikálnych alebo monetárnych jednotkách)

Ekosystémové účtovníctvo a reportovanie

Aplikácia konceptu ESS

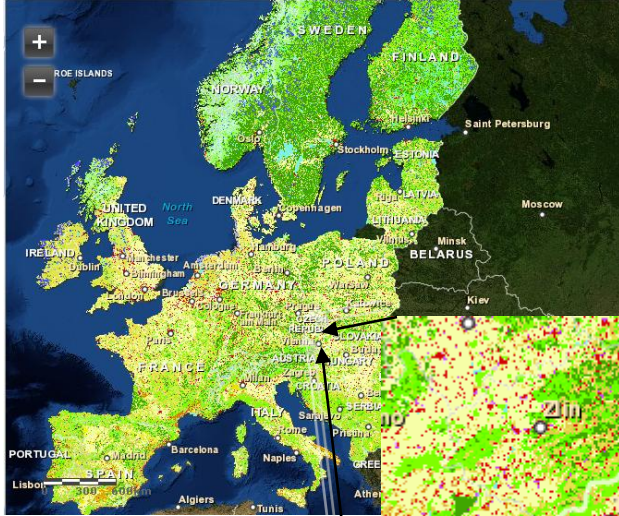
Priestorový aspekt (delineácia)

Časový aspekt (monitorovanie zmeny)

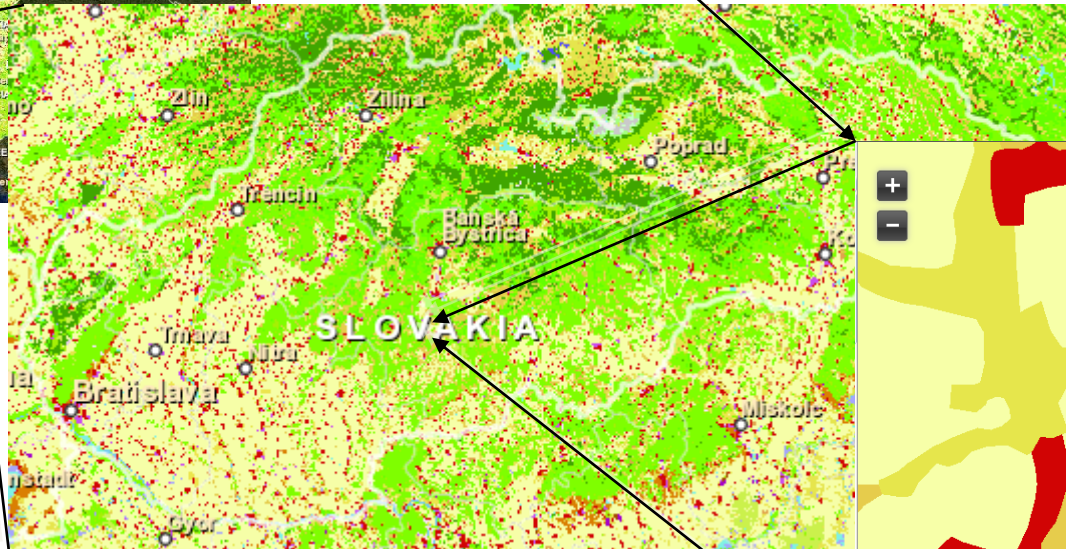
Aplikácia konceptu do praxe (nie len v rezorte ŽP a medzisektorovo)

3 navzájom kompatibilné úrovne prístupu

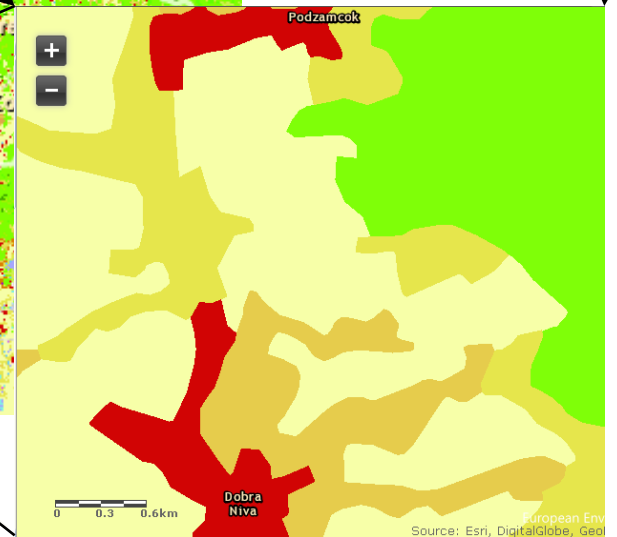
Európska



Národná



Lokálna



Corine Land Cover/HRLs



EUNIS



Biotopy

Terestrické ekosystémy Terrestrial ecosystems

- Urbánne ekosystémy** Urban ecosystems
- Poľnohospodárske ekosystémy** Cropland
- Trávne porasty** Grassland
- Dreviny a lesy** Woodland and forest
- Vresoviská a kroviny** Heathland and shrub
- Plochy bez vegetácie alebo s riedkou vegetáciou** Sparsely or unvegetated land
- Vnútrozemské mokrade** Inland wetlands

Sladkovodné ekosystémy Freshwater ecosystems

- Vodné toky a plochy** Rivers and lakes


Morské ekosystémy Marine ecosystems

- Marine inlets and transitional waters**
- Coastal areas**
- Shelf**
- Open ocean**

Typy ekosystémov

Európska úroveň

Major ecosystem category (level 1)	Ecosystem type for mapping and assessment (level 2)	Representation of habitats (functional dimension by EUNIS)/MSFD for marine ecosystems)	Representation of land cover (spatial dimension)	Benefits of mapping	Problems of mapping	Listed as ecosystems, major habitat types or reporting categories in	Spatial data availability
Terrestrial	Urban	Constructed, industrial and other artificial habitats	Urban, industrial, commercial and transport areas, urban green areas, mines, dump and construction sites	Urban areas represent mainly human habitats but they usually include significant areas for synanthropic species	CLC's coarse resolution that needs to be complemented e.g. by Urban atlas (ca. 300 cities) and HRL Imperviousness but see (23)	EUNIS (SEBI) UNEP/CBD* MA*	CLC Urban Atlas HRL Imperviousness
	Cropland	Regularly or recently cultivated agricultural, horticultural and domestic habitats	Annual and permanent crops	Main food production areas, intensively managed ecosystems	Habitat classification (e.g. EUNIS) includes permanent crops into Heathland and scrub	EUNIS (SEBI, Baseline) UNEP/CBD MA	CLC
	Grassland	Grasslands and land dominated by forbs, mosses or lichens	Pastures and (semi-) natural grasslands	Areas dominated by grassy vegetation of two kinds – managed pastures and natural (extensively managed) grasslands	Distinction between intensively used and more natural grasslands requires additional datasets (Art. 17)	EUNIS (SEBI, Baseline) UNEP/CBD WWF+ MA	CLC HRL grasslands
	Woodland and forest	Woodland, forest and other wooded land	Forests	Climax ecosystem type on most of the area supporting many ecosystem services	Missing information on quality and management requires additional datasets (Art. 17, HRL forest)	EUNIS (SEBI, Baseline) UNEP/CBD WWF MA	CLC HRL forests (EFDAC)
	Heathland and shrub	Heathland, scrub and tundra (vegetation dominated by shrubs or dwarf shrubs)	Moors, heathland and sclerophyllous vegetation	Mostly secondary ecosystems with unfavourable natural conditions	Mapping the condition of these areas requires combination with Art.17	EUNIS (SEBI, Baseline) WWF MA	CLC
	Sparsely vegetated land	Unvegetated or sparsely vegetated habitats (naturally unvegetated areas)	Open spaces with little or no vegetation (bare rocks, glaciers and beaches, dunes and sand plains included)	Ecosystems with extreme natural conditions that might support valuable species. Includes coastal ecosystems on (beaches, dunes) affected by marine ecosystems	Becomes a conglomerate of distinctive rarely occurring ecosystems, often defined by different geographical location	EUNIS (SEBI, Baseline) UNEP/CBD MA	CLC



European Commission

Technical Report – 2019-007

Mapping and Assessment of Ecosystems and their Services

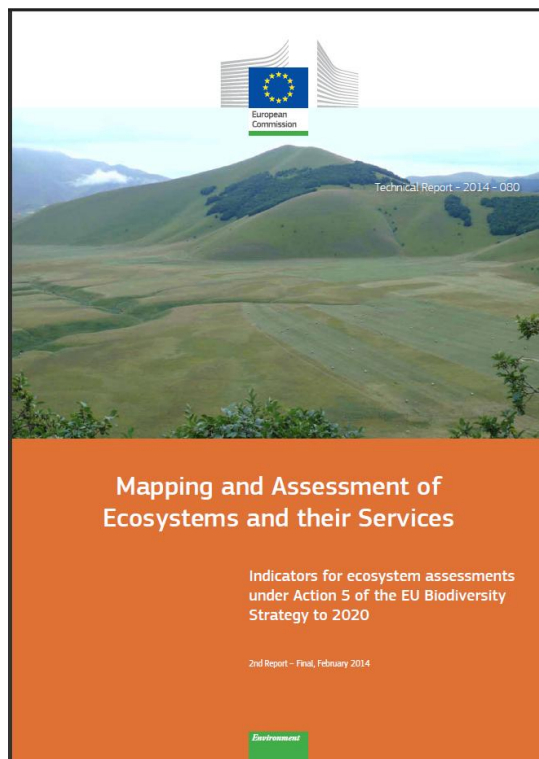
An analytical framework for ecosystem assessments under Action 5 of the EU Biodiversity Strategy to 2020.

Discussion paper – Final, April 2013

Environment

Typy ekosystémov

Európska úroveň



ANNEX 2: CORRESPONDENCE BETWEEN CORINE LAND COVER CLASSES AND ECOSYSTEM TYPES (TABLE 3)

CLC Level 1	CLC Level 2	CLC Level 3	Ecosystem types level 2
1. Artificial surfaces	1.1. Urban fabric	1.1.1. Continuous urban fabric	Urban
		1.1.2. Discontinuous urban fabric	
	1.2. Industrial, commercial and transport units	1.2.1. Industrial or commercial units	
		1.2.2. Road and rail networks and associated land	
		1.2.3. Port areas	
		1.2.4. Airports	
	1.3. Mine, dump and construction sites	1.3.1. Mineral extraction sites	
		1.3.2. Dump sites	
		1.3.3. Construction sites	
	1.4. Artificial non-agricultural vegetated areas	1.4.1. Green urban areas	
1.4.2. Sport and leisure facilities			
2. Agricultural areas	2.1. Arable land	2.1.1. Non-irrigated arable land	Cropland
		2.1.2. Permanently irrigated land	
		2.1.3. Rice fields	
	2.2. Permanent crops	2.2.1. Vineyards	Grassland
		2.2.2. Fruit trees and berry plantations	
		2.2.3. Olive groves	
	2.3. Pastures	2.3.1. Pastures	Cropland
	2.4. Heterogeneous agricultural areas	2.4.1. Annual crops associated with permanent crops	
		2.4.2. Complex cultivation patterns	
		2.4.3. Land principally occupied by agriculture, with significant areas of natural vegetation	
2.4.4. Agro-forestry areas			
3. Forests and semi-natural areas	3.1. Forests	3.1.1. Broad-leaved forest	Woodland and forest
		3.1.2. Coniferous forest	
		3.1.3. Mixed forest	
	3.2. Shrub and/or herbaceous vegetation association	3.2.1. Natural grassland	Grassland
		3.2.2. Moors and heathland	
		3.2.3. Sclerophyllous vegetation	
		3.2.4. Transitional woodland shrub	
	3.3. Open spaces with little or no vegetation	3.3.1. Beaches, dunes, and sand plains	Sparsely vegetated land
		3.3.2. Bare rock	
		3.3.3. Sparsely vegetated areas	
3.3.4. Burnt areas			
3.3.5. Glaciers and perpetual snow			
4. Wetlands	4.1. Inland wetlands	4.1.1. Inland marshes	Wetlands
		4.1.2. Peatbogs	
	4.2. Coastal wetlands	4.2.1. Salt marshes	Marine inlets and transitional waters
		4.2.2. Salines	
		4.2.3. Intertidal flats	
	5. Water bodies	5.1. Inland waters	5.1.1. Water courses
5.1.2. Water bodies			
5.2. Marine waters		5.2.1. Coastal lagoons	Marine inlets and transitional waters
		5.2.2. Estuaries	
		5.2.3. Sea and ocean	

Typy ekosystémů

Evropská úroveň

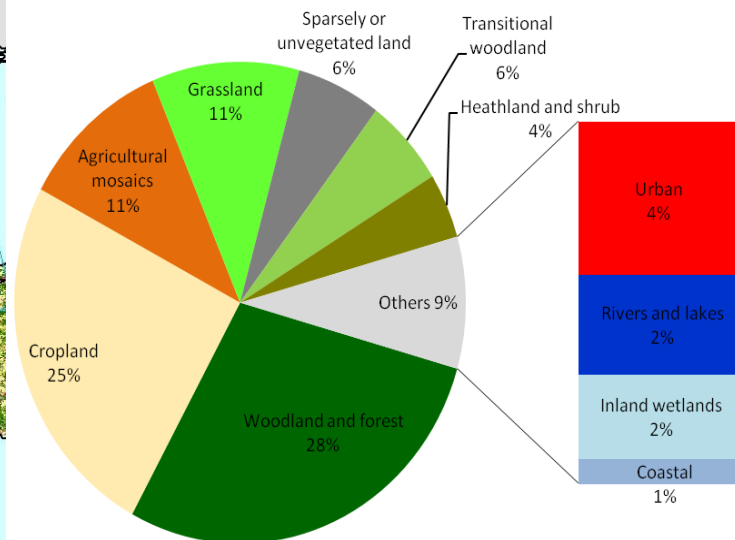


Indicator SEBI 04 ecosystem coverage - 2006

Ecosystems

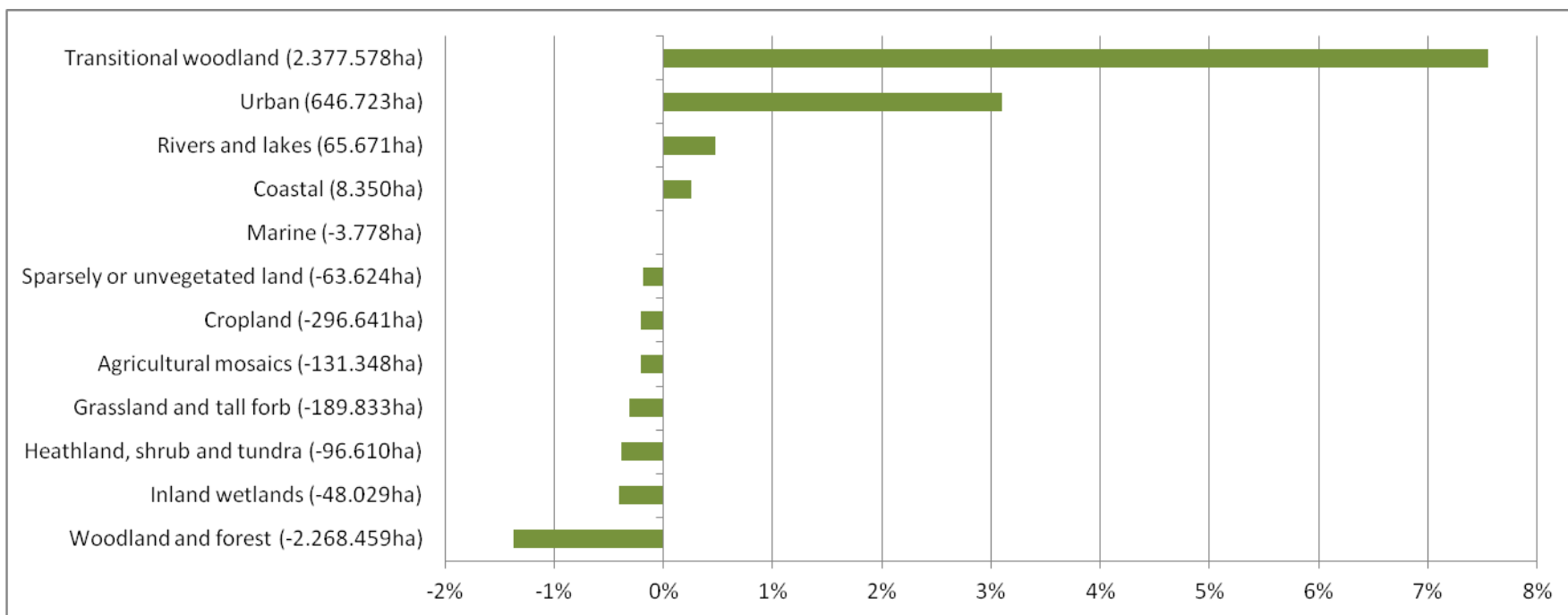
- Constructed, industrial and other artificial
- Regularly or recently cultivated agricultural
- Agricultural mosaics
- Woodland and forest
- Grassland and tall forb
- Heathland, shrub and tundra
- Transitional woodland
- Inland unvegetated or sparsely vegetated
- Mire, bog, fen
- Coastal
- Inland surface water
- Marine

Terrestrial and freshwater ecosystem stocks in 2006



(ha)	Urban	Cropland	Agricultural mosaics	Woodland and forest	Grassland	Heathland and shrub	Transitional woodland	Sparsely or unvegetated land	Inland wetlands	Coastal	Rivers and lakes	Marine*
Ecosystem 2000	20,848,150	142,603,341	62,417,659	165,517,350	60,603,248	25,095,852	31,479,904	34,819,887	11,930,146	3,263,563	13,941,404	125,013,731
Consumption of initial ES	-63,162	-555,496	-246,661	-3,528,860	-346,553	-167,999	-1,364,657	-189,392	-62,126	-22,239	-28,956	-4,917
Formation of new ES	709,885	258,855	115,313	1,260,401	156,720	71,389	3,742,235	125,768	14,097	30,589	94,627	1,139
Net Formation of ES	646,723	-296,641	-131,348	-2,268,459	-189,833	-96,610	2,377,578	-63,624	-48,029	8,350	65,671	-3,778
<i>Net formation as % of initial year</i>	3.1	-0.2	-0.2	-1.4	-0.3	-0.4	7.6	-0.2	-0.4	0.3	0.5	0.0
Total turnover of ES	773,047	814,351	361,974	4,789,261	503,273	239,388	5,106,892	315,160	76,223	52,828	123,583	6,056
<i>Total turnover as % of initial year</i>	3.7	0.6	0.6	2.9	0.8	1.0	16.2	0.9	0.6	1.6	0.9	0.0
Ecosystem 2006	21,494,873	142,306,700	62,286,311	163,248,891	60,413,415	24,999,242	33,857,482	34,756,263	11,882,117	3,271,913	14,007,075	125,009,953

Relative changes in ecosystem coverage 2000-2006



Ekosystémové služby

The **Millennium Ecosystem Assessment (MA)** was the first large scale ecosystem assessment and it provides a framework that has been adopted and further refined by TEEB and CICES.

The MA organises ecosystem services into four well known groups:

1. **Produkčné** provisioning services
2. **Regulačné** regulating services
3. **Kultúrne** cultural services
4. **Podporné** supporting services

The Economics of Ecosystems and Biodiversity (TEEB) proposes a typology of 22 ecosystem services divided in 4 main categories, mainly following the MA classification:

1. provisioning services
2. regulating services
3. habitat services
4. cultural and amenity services

The **Common International Classification of Ecosystem Services (CICES)** offers a structure that links with the framework of the UN System of Environmental-Economic Accounts (SEEA 2003) which is currently being revised with a volume on ecosystem (capital) accounts. **CICES** builds on the existing classifications but focusses on the ecosystem service dimension.

Ekosystémové služby

Porovnanie klasifikácií

MA categories	TEEB categories		CICES v4.3 group [†]
Food (fodder)	Food	Provisioning services	Biomass [Nutrition]
			Biomass (Materials from plants, algae and animals for agricultural use)
Fresh water	Water		Water (for drinking purposes) [Nutrition]
			Water (for non-drinking purposes) [Materials]
Fibre, timber	Raw Materials		Biomass (fibres and other materials from plants, algae and animals for direct use and processing)
Genetic resources	Genetic resources		Biomass (genetic materials from all biota)
Biochemicals	Medicinal resources		Biomass (fibres and other materials from plants, algae and animals for direct use and processing)
Ornamental resources	Ornamental resources	Biomass (fibres and other materials from plants, algae and animals for direct use and processing)	
			Biomass based energy sources
			Mechanical energy (animal based)
Air quality regulation	Air quality regulation	Regulating services (TEEB)	[Mediation of] gaseous/air flows
Water purification and water treatment	Waste treatment (water purification)		Mediation [of waste, toxics and other nuisances] by biota
			Mediation [of waste, toxics and other nuisances] by ecosystems
Water regulation	Regulation of water flows		[Mediation of] liquid flows
	Moderation of extreme events		
Erosion regulation	Erosion prevention		[Mediation of] mass flows
Climate regulation	Climate regulation		Atmospheric composition and climate

Výzvy do blízkej budúcnosti

Mechanizmus identifikácie, hodnotenia a zmeny ekosystémov a ekosystémových služieb

Vzťahy ekosystémových služieb medzi sebou navzájom (celkový potenciál pre ESS, koexistujúce, podporujúce sa, vylučujúce sa ESS)

Model ekonomiky ekosystémových služieb (subjekty, platby, geografické aspekty, logistika...)

Finančné zdroje na platby za ekosystémové služby (dotácie, odplaty za služby, investície do služieb, Zelená infraštruktúra)

Zelená infraštruktúra:

- Ochrana ekosystémov a biodiverzity
- Zlepšovanie **fungovania** ekosystémov a podpora ekosystémových služieb
- Podpora zdravia a blahobytu **spoločnosti**
- Podpora rozvoja zelenej **ekonomiky** a udržateľného **manažmentu** krajiny a vody



Ďakujem za pozornosť.

