



UN Environment World Conservation Monitoring Centre

**TESTING THE DEVELOPMENT OF SPECIES ACCOUNTS FOR MEASURING
ECOSYSTEM CONDITION IN THE EU**

24TH LONDON GROUP MEETING, DUBLIN, 1ST – 4TH OCTOBER 2018

Steven King – steven.king@unep-wcmc.org

10/2/18

Testing the development of Species Accounts for measuring ecosystem condition at EU level

Outline:

- MAES Typology
- Testing the Calculation of Species Accounts (Top Down using Birds Directive data)
- Outline our approach for spatially referenced Species accounts (Bottom Up using national Bird Surveys)
- Key discussion points for the London Group



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MAES Typology (Terrestrial)

MAES Ecosystem Types	CLC classes	CLC labels
1 - Urban	111	Continuous urban fabric
	112	Discontinuous urban fabric
	121	Industrial or commercial units
	122	Road and rail networks and associated land
	123	Port areas
	124	Airports
	131	Mineral extraction sites
	132	Dump sites
	133	Construction sites
	141	Green urban areas
2 -Cropland	142	Sport and leisure facilities
	211	Non-irrigated arable land
	212	Permanent irrigated arable land
	213	Rice fields
	221	Vineyards
	222	Fruit trees and berry plantations
	223	Olive trees
	241	Annual crops associated with permanent crops
	242	Complex cultivation patterns
	243	Agriculture land with significant areas of natural vegetation
	244	Agro-forestry areas

MAES Typology

3 - Grassland	231	Pastures
	321	Natural Grassland
4 - Forest	311	Broad-leaved forest
	312	Coniferous forest
	313	Mixed forest
	324	Transitional woodland shrub
5 - Heathland and shrub	322	Moors and heathland
	323	Sclerophyllous vegetation
6 - Sparsely vegetated land	333	Sparsely vegetated areas
	331	Beaches, dunes and sand plains
	332	Bare rock
	334	Burnt areas
	335	Glaciers and perpetual snows
7 - Inland wetlands	411	Inland marshes
	412	Peatbogs
8 - Rivers and lakes	511	Water courses
	512	Water bodies
9 - Marine Inlets and transitional waters	421	Salt marshes
	422	Salines
	423	Intertidal flats
	521	Coastal lagoons
	522	Estuaries
	523	Sea and Ocean

Article 12 Data Review

New Article 12 Data Reporting:

<https://bd.eionet.europa.eu/article12/summary?>

EU population status assessments					
	Breeding Population			Breeding Area	
	Size & Unit	ST Trend	LT Trend	Area	ST Trend
EU27	55600 - 81000 p	-	u	2780000	

are listed on mouse over the Bird status symbol. The EU trends were assessed at the subspecies level. The EU trends can cover several subspecific units, which are listed on mouse over the Trend symbol.

Current selection: 2008-2012, Bird Status.

Species	Assessment
<i>Accipiter brevipes</i>	Unknown
<i>Accipiter gentilis arrigonii</i>	Secure
<i>Accipiter gentilis arrigonii</i>	Threatened
<i>Accipiter gentilis gentilis</i>	Secure

Article 12 Data Review

New Article 12 Data Reporting:

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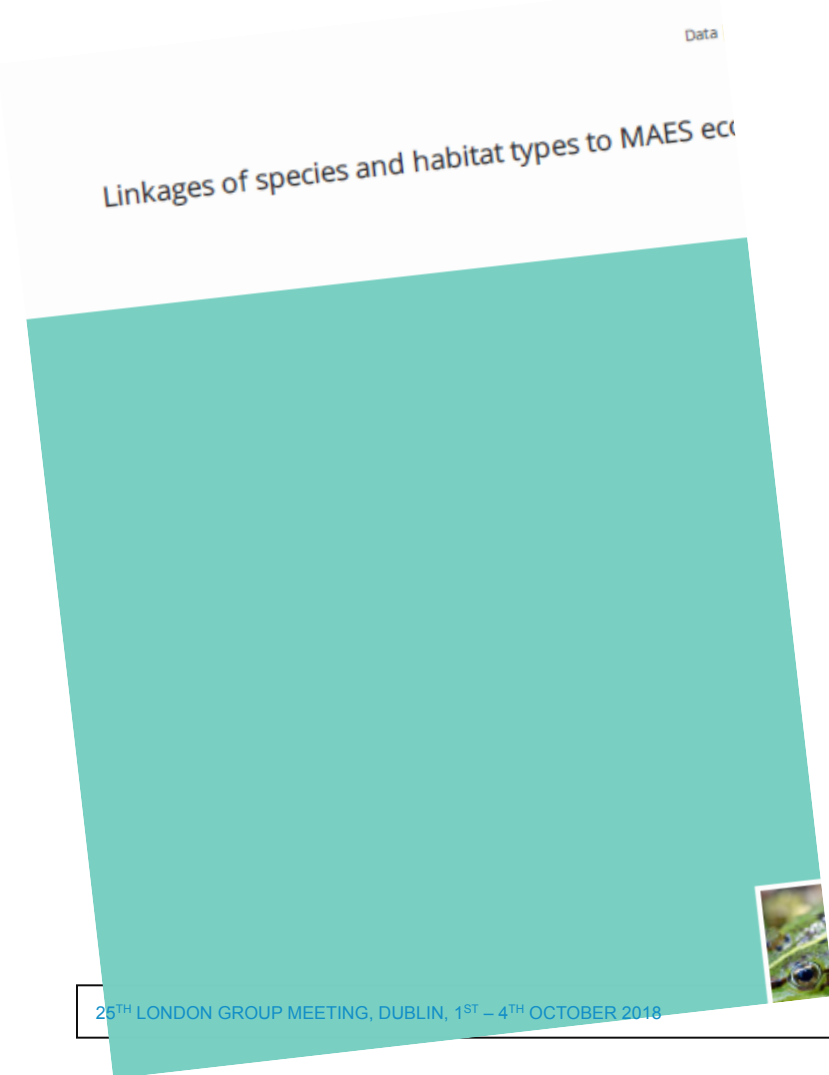
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Current status	
Accipiter b...	Secure
Accipiter gentilis arrigonii	Threatened
Accipiter gentilis gentilis	Secure

Article 12 Approach to Calculating Species Accounts

Top Down Approach:

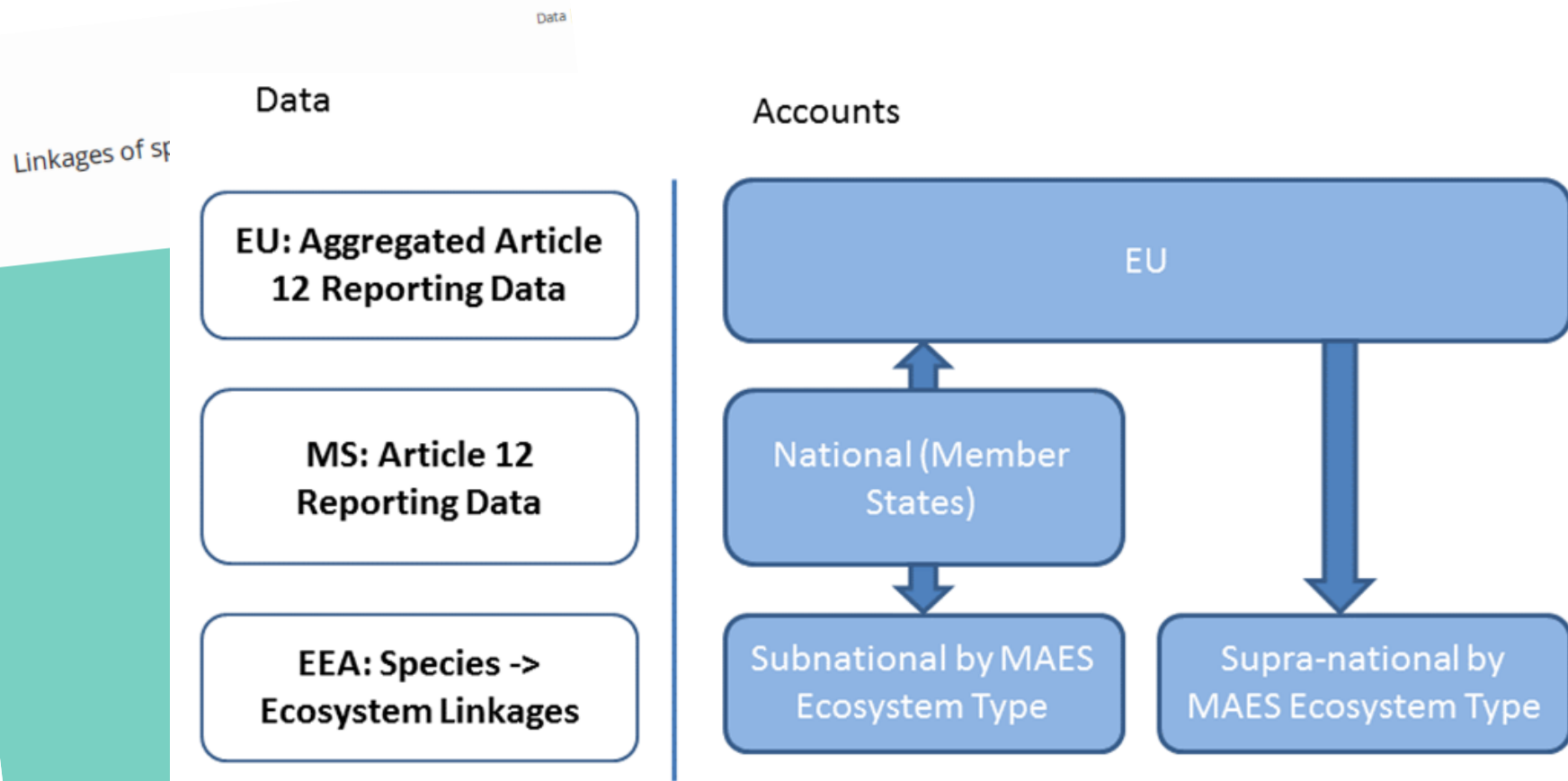


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Article 12 Approach to Calculating Species Accounts

Top Down Approach:



Article 12 Species Account (Common Birds, EU)

	Bird group classes ¹	MAES Type									All Ecosystems
		Cropland	Grassland	Heathland / Shrub	Marine Inlets	Rivers / Lakes	Sparsely Vegetated	Urban	Wetlands	Woodland / Forest	
Situation 2005-2007 ²											
Total abundance (No. individuals)	Other										
	Farmland										
	Forest										
Number of Species	Other										
	Farmland										
	Forest										
Shannon's Index	Other										
	Farmland										
	Forest										
Trends in Status 2008 - 2012											
Overall Trend ³	Other	25.00	8.33	8.00	-23.08	-15.00	-4.35	20.83	-9.52	18.52	3.00
	Farmland	-73.33	-61.29	-52.17	-100.00	-100.00	-41.67	-55.56	-100.00	-100.00	-65.00
	Forest	50.00	-	0.00	-	100.00	100.00	-33.33	0.00	15.38	16.67
Net Change											
Total abundance (No. individuals)	Other										
	Farmland										
	Forest										
Number of Species	Other										
	Farmland										
	Forest										
Shannon's Index	Other										
	Farmland										
	Forest										
Situation 2008 - 2012											
Total abundance (No. individuals)	Other	1.42E+08	4.71E+07	4.35E+07	1.49E+06	2.16E+07	2.04E+07	2.32E+08	1.58E+07	3.26E+08	8.50E+08
	Farmland	1.13E+08	4.68E+07	3.30E+07	1.42E+04	2.25E+06	8.09E+06	6.68E+07	5.97E+06	1.95E+07	2.96E+08
	Forest	1.61E+06	0.00E+00	1.86E+07	0.00E+00	1.12E+05	1.16E+06	2.48E+06	2.40E+05	1.17E+08	1.41E+08
Number of species	Other	24	12	25	13	40	23	24	42	54	100
	Farmland	30	31	23	1	4	12	9	6	4	40
	Forest	2	0	4	0	1	1	3	2	39	36
Shannon's Index	Other	1.77	0.83	2.18	1.67	2.64	1.86	2.40	2.68	2.93	3.29
	Farmland	2.64	2.27	2.41	0.00	0.13	1.60	1.86	1.20	1.15	3.01
	Forest	0.54	-	0.78	-	0.00	0.00	0.79	0.69	2.95	2.93

Article 12 Species Account (Common Birds, EU)

	Bird group classes ¹	MAES Type	
		Cropland	Grassland
Situation 2008 - 2012			
Total abundance (No. individuals)	Other	1.42E+08	4.71E+07
	Farmland	1.13E+08	4.68E+07
	Forest	1.61E+06	0.00E+00
Number of species	Other	24	12
	Farmland	30	31
	Forest	2	0
Shannon's Index	Other	1.77	0.83
	Farmland	2.64	2.27
	Forest	0.54	-

Moving to Spatially Referenced Species Accounts

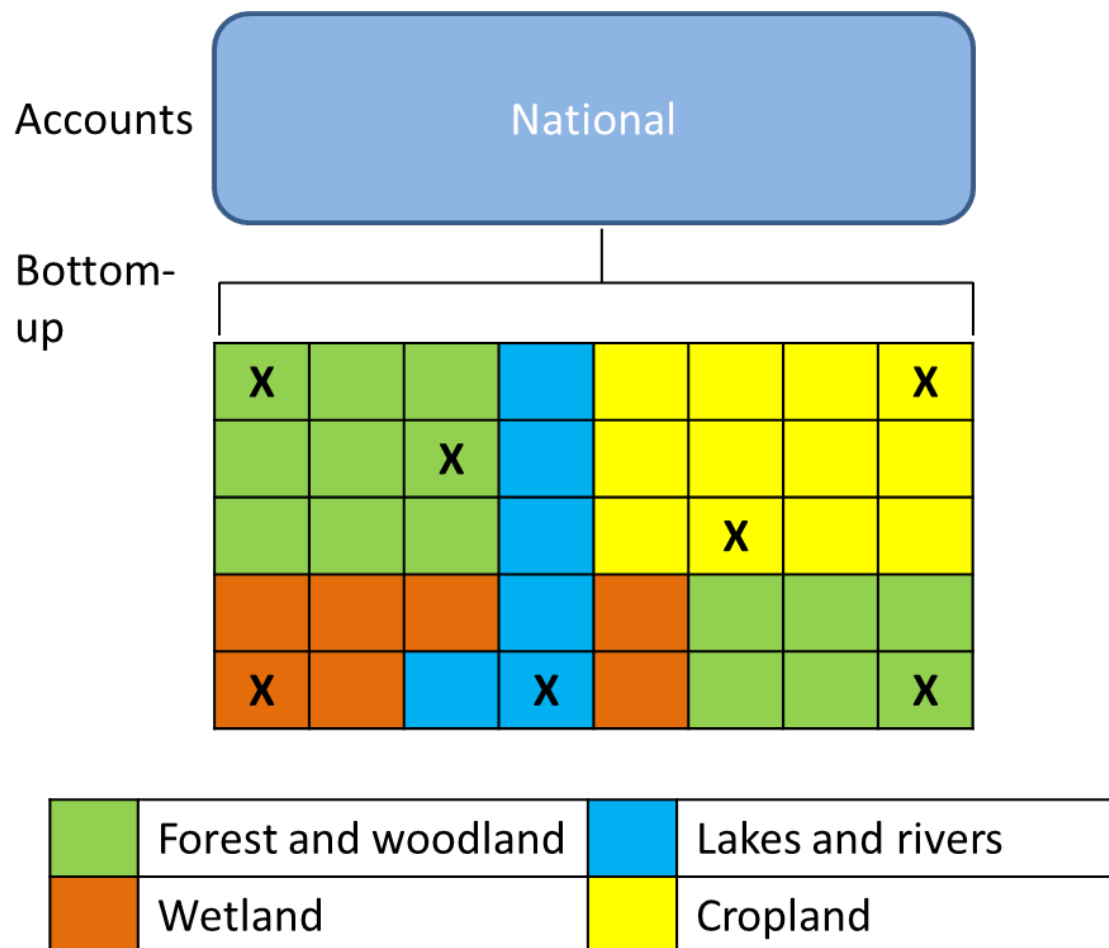
Why?

- Uncertainties emerge when disaggregating abundance measures across ecosystem preferences.
- Improve the spatial differentiation of condition measures within the same ecosystem type

How?

- Using geo-referenced data from National Bird surveys coordinated by NGOs
- Select UK (BTO) and Czech Republic as case studies

Bottom up approach



Dealing with inconsistent sampling?

Bird Data for CLC 2006

X							X
		X					
					X		
X							X

X	Sampled in 2006 but not 2012
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Bird Data for CLC 2012

	X			X			X
		X					
X			X			X	
		X			X		
X			X				X

X	Sampled in 2012 but not 2006
---	------------------------------

Some assumptions for the survey data help

Assumption 1:

- There are sufficient surveys to identify all common bird species in their preferred MAES ecosystems

Assumption 2:

- There are sufficient survey counts to characterise the relative evenness of the common bird specie population

These are considered reasonable for the national scale, for the MAES typology and for common birds

Survey results for a 1,000 km² forest area



Some
corrections
for sampling
effort can
also be made

Survey results for a 1,000 km² forest area

Species	Total abundance measured in 100 x 1km ² survey sites	Total abundance measured in 10 x 1km ² survey sites	Abundance / km ² of Forest
Woodpecker	500	50	5
Grouse	1500	150	15
Goshawk	80	8	0.8
Great Horned Owl	50	5	0.5
Wood Thrush	600	60	6
Broad-winged Hawk	60	6	0.6
Barred Owl	20	2	0.2
Chaffinch	2000	200	20
Jay	350	35	3.5
Blckcap	700	70	7
Total Abundance	5860	586	58.6
Species Richness	10	10	10
Shannons Index	1.75	1.75	1.75

Simple Allocation

X	X'	X'	X'	X'	X'	X'	X	Abundance in 10 x 1 km ² sites	Abundance / km ² of Forest
X'	X'	X	X'	X'	X'	X'	X'	50	5
X'	X'	X'	X'	X'	X	X'	X'	150	15
X'	X'	X'	X'	X'	X'	X'	X'	8	0.8
X'	X'	X'	X'	X'	X'	X'	X'	5	0.5
X	X'	X'	X	X'	X'	X'	X	60	6
Broad-winged Hawk								6	0.6
Barred Owl								20	2
Chaffinch								2000	200
Jay								350	35
Blckcap								700	70
Total Abundance								5860	586
Species Richness								10	10
Shannons Index								1.75	1.75

Some Discussion Questions!!

Question 1:

- Are common birds reasonable indicators for condition? What perverse signals may emerge? What are the links to services?

Question 2:

- What should be our ambitions for spatial differentiation? Assets? Management areas? Ecological based (e.g. watersheds)?

Question 3:

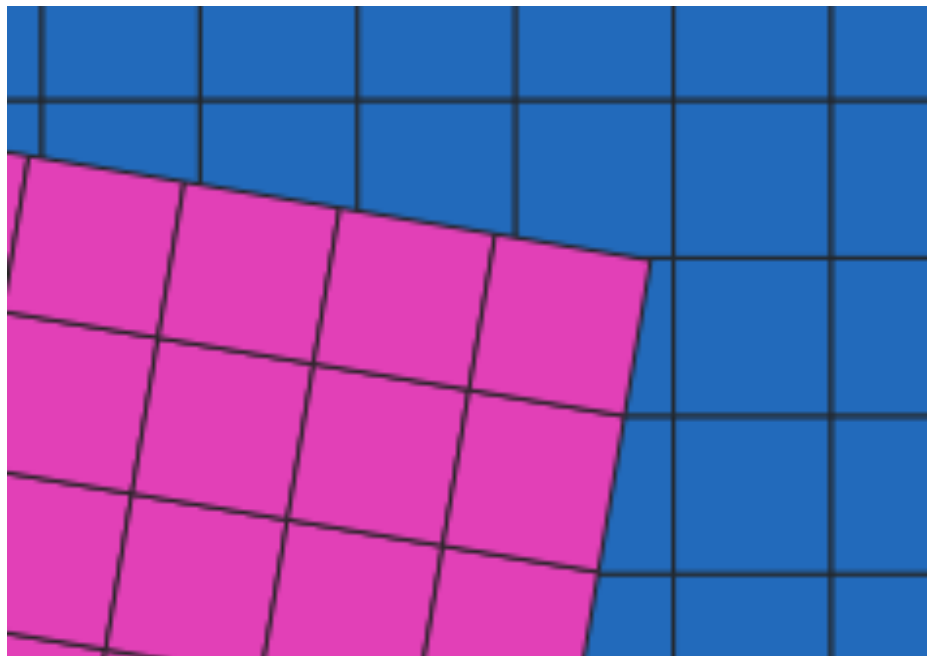
- How do we account for biodiversity at landscape scale? (multifunctional landscapes)

Question 4:

- How do we connect this information on species to economic decisions? Especially – what information on land use can we use?

Data Harmonization

Lots of work!



BTO breeding bird
survey squares in Pink

EEA grid Accounting
grid in Blue.

Czech data based on
6km transects