



ASseSSment

Policy



LeSSonS



ReSeArch

Communication



Assessment

Policy

Spanish NEA:  
From research applications  
to policy implications



Lessons



Research

Communication

# ASSESSment



Spa

From

# TIMELINE

## Biophysical assessment

## Socio-cultural & economic assessment

Conceptual framework design

### Integral analysis

Ecosystems & biodiversity

Ecosystem services & human wellbeing

Direct & indirect drivers of change

Spatial analysis

Systematic review

Participatory scenarios

Market based methods

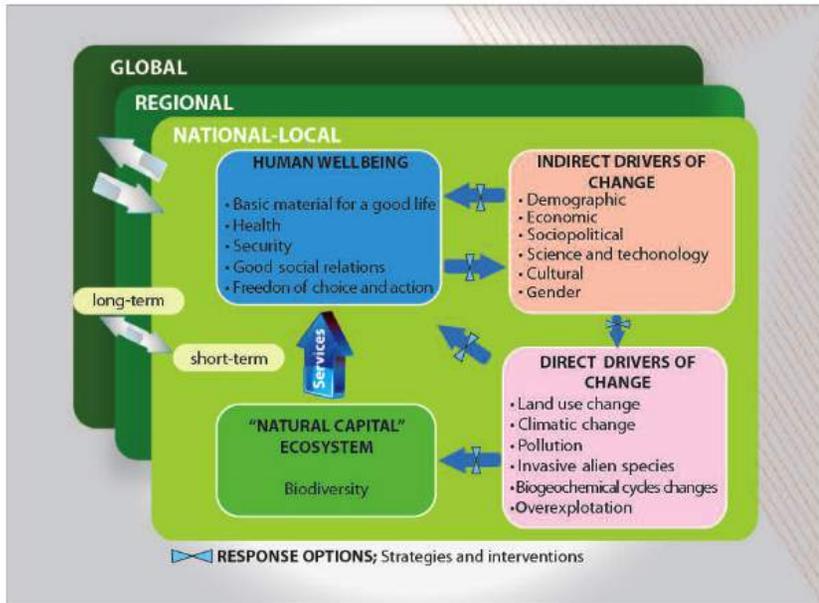
Stated methods and preferences

2010

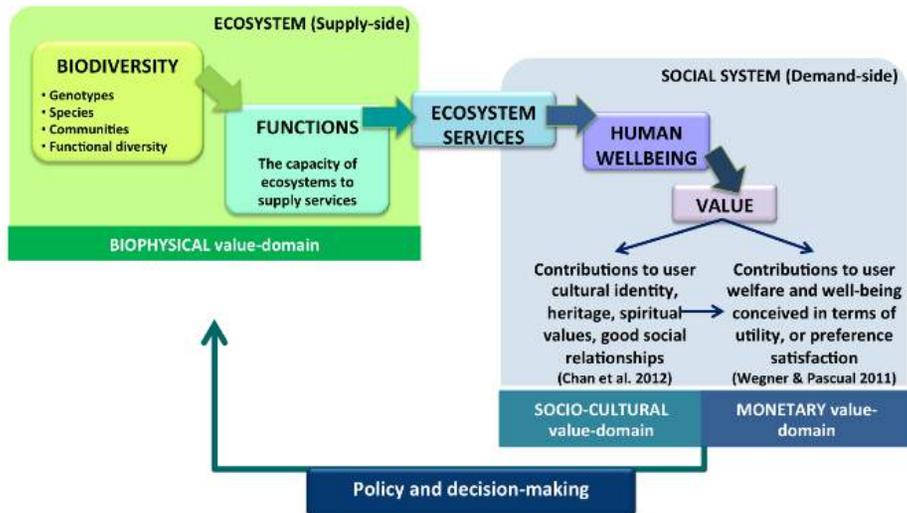
2012

2014  
(on going)

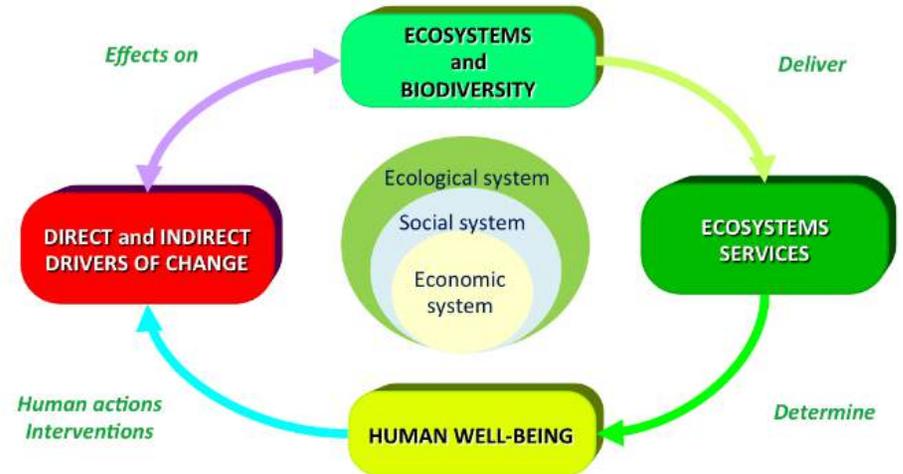
# FRAMEWORKS



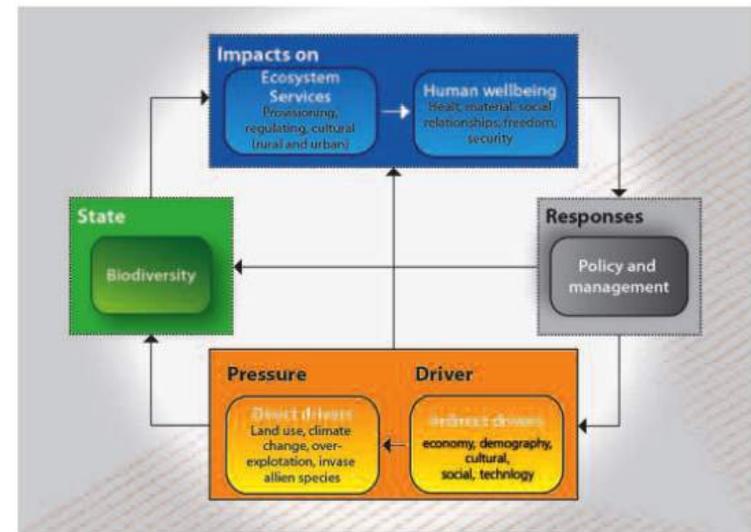
MA, 2005



Martín-López et al, 2013

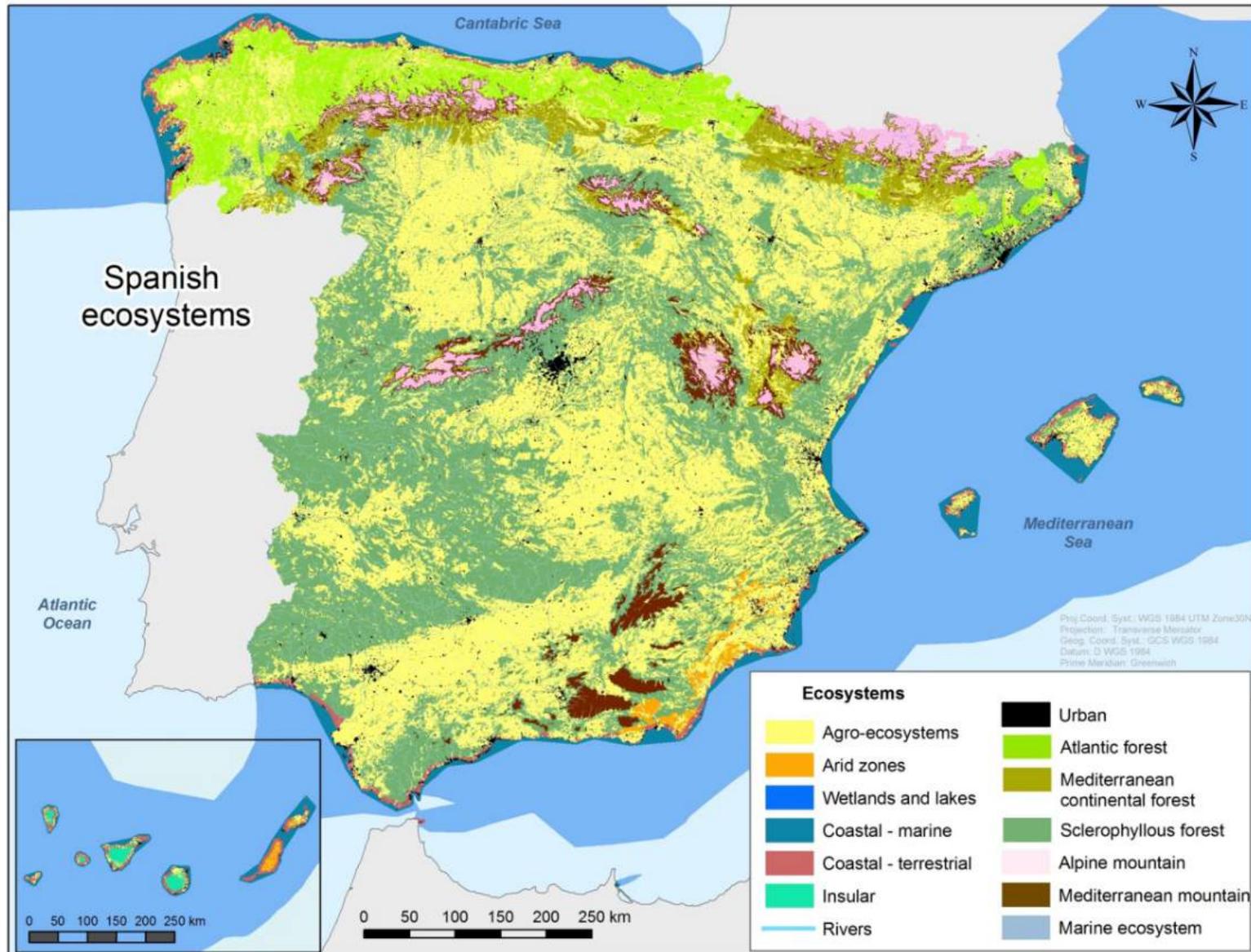


EME, 2011



Santos-Martín et al, 2013

# 14 ECOSYSTEMS



# ES CLASSIFICATION

ES Type	Spanish NEA	MA	TEEB	CICES
Provisioning services	Crops and Livestock	Food (fodder)	Food	Terrestrial plants and animal foodstuffs
	Aquaculture product			Freshwater plants and animal foodstuffs
	Wild plants and animals			Marine algae and animal foodstuffs
	Domestic water use	Fresh water	Water	Water for human consumption
	Agricultural water use			Water for agricultural use
	Industrial water use			Water for industrial and energy use
	Biotic materials (i.e. timber, pulp, vegetal fibers)	Fibre, timber	Raw Materials	Biotic materials
	Gene pool (Native breeds and varieties, genetic information of biotechnological interest)	Genetic resources	Genetic resources	Biotic Materials (Genetic resources)
	Natural medicines (Active ingredients for traditional medicines and pharmaceutical industry)	Biochemicals	Medicinal resources	Biotic Materials (Medicinal and cosmetic resources)
		Ornamental resources	Ornamental resources	Biotic Materials (Ornamental resources)
Renewable Energy (biomass based and hydropower)			Biomass based energy	

# ES SELECTION

We selected 22 ecosystem services from the provisioning ( $N=8$ ), regulating ( $N=7$ ) and cultural categories ( $N=7$ ).



We assessed the influence of direct and indirect drivers of change.

## Direct drivers

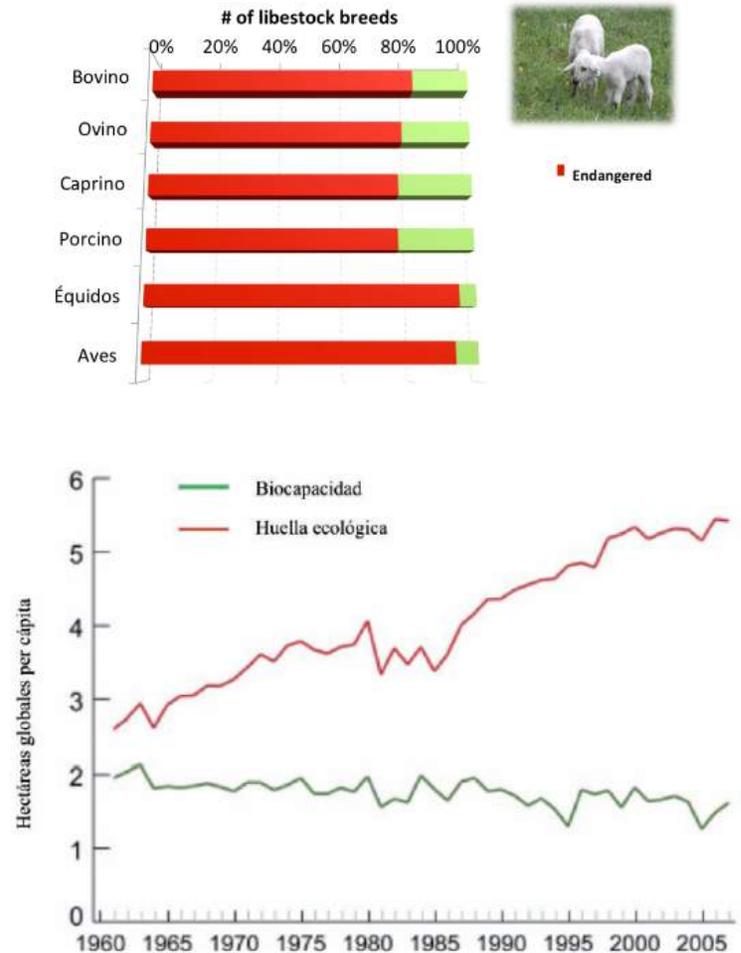
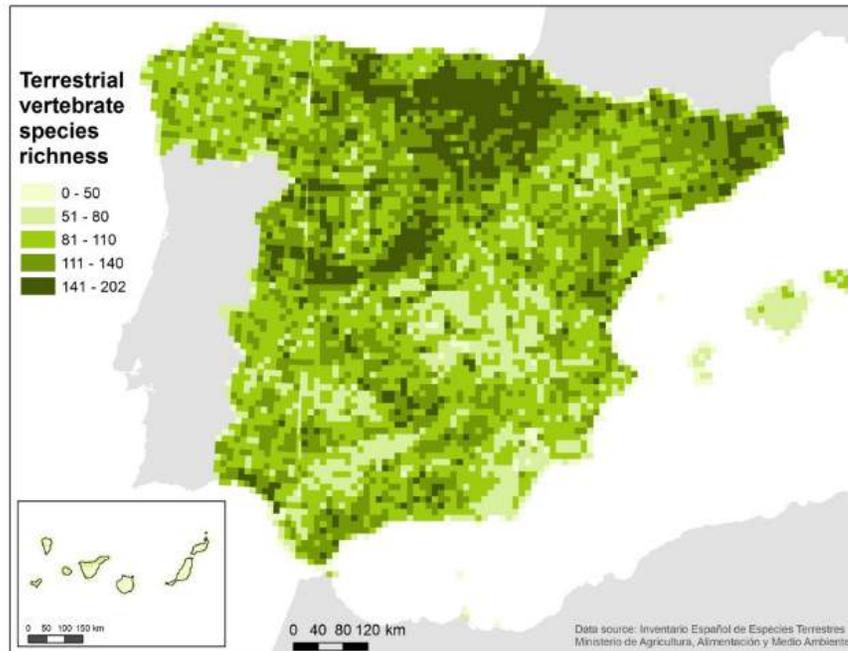
- ✓ Land use change
- ✓ Climate change
- ✓ Pollution
- ✓ Invasive alien species
- ✓ Overexploitation

## Indirect drivers

- ✓ Demographic
- ✓ Socio-political
- ✓ Gender
- ✓ Cultural
- ✓ Economic
- ✓ Science & Technology

# TYPE OF DATA

(measure, indicator, index....)

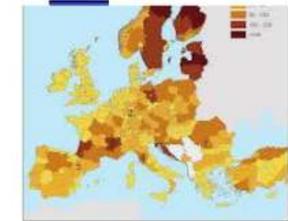
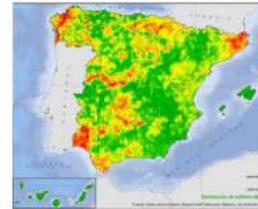


# SOURCES OF DATA

National Statistic



Spatial information



In-situ Observations  
(case studies)



Simulation Models



# STATE OF ES DATA

Provisioning services



Regulating services



Cultural services



Supply metrics



Service metrics

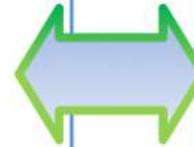


Benefit metrics



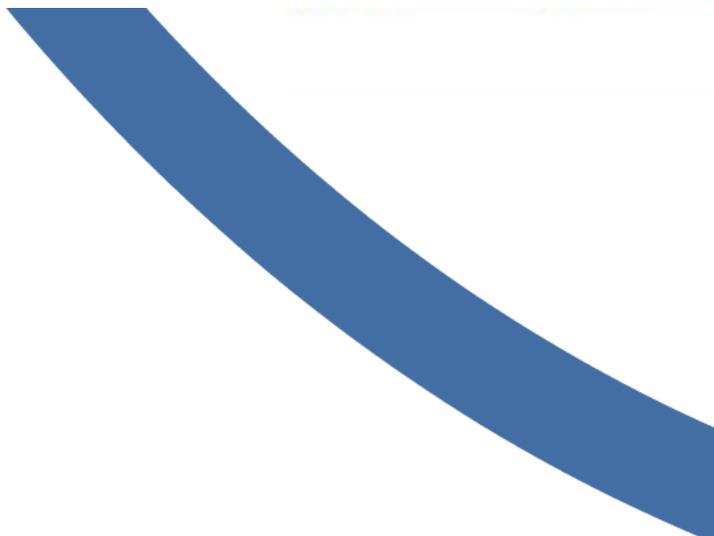
# STAKEHOLDERS

- ✓ Network of researchers (National Research Council –CSIC- and Universities)- More than 60 researchers from 20 institutions
- ✓ Ministries
- ✓ Regional Governments
- ✓ Spanish Observatory of Sustainability (OSE)
- ✓ Network of complementary projects
- ✓ Communication Unit
- ✓ International advisory board
- ✓ Stakeholders involved: NGOs, enterprises, general population



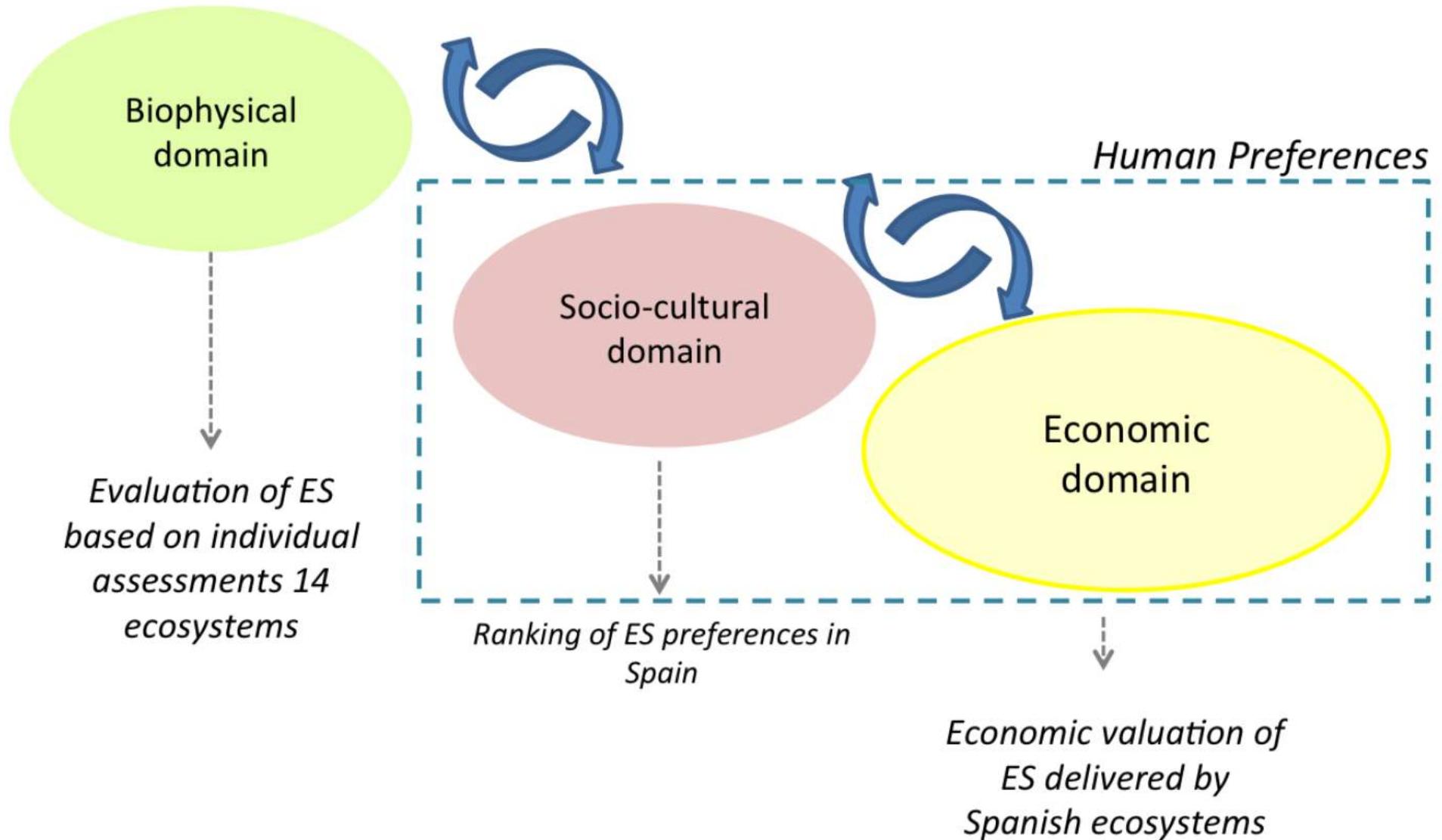
- ✓ Data bases
- ✓ Cartographic information
- ✓ Literature review
- ✓ Expert panels
- ✓ Focus groups
- ✓ Workshops
- ✓ Interviews
- ✓ Questionnaires



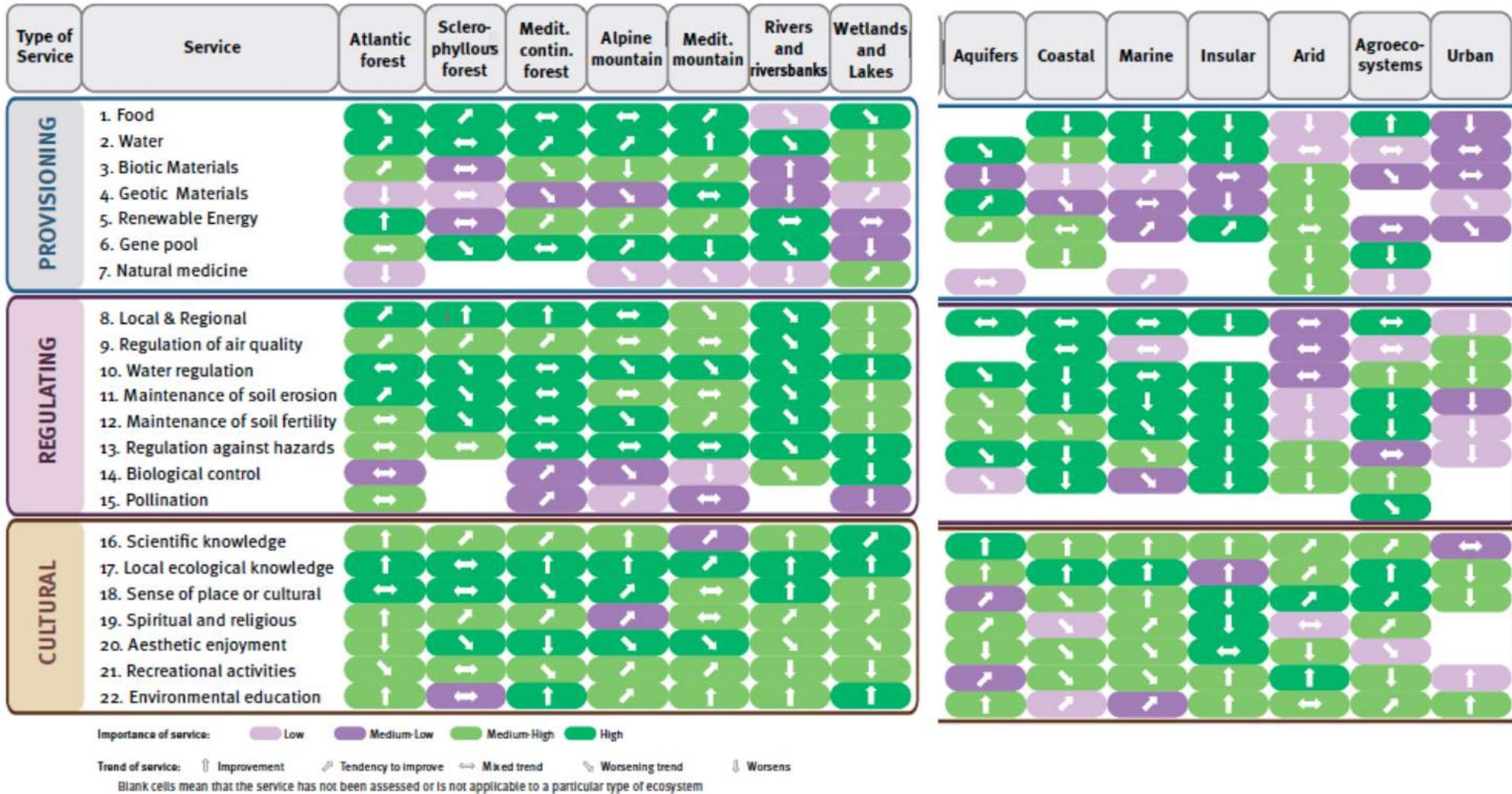


Research

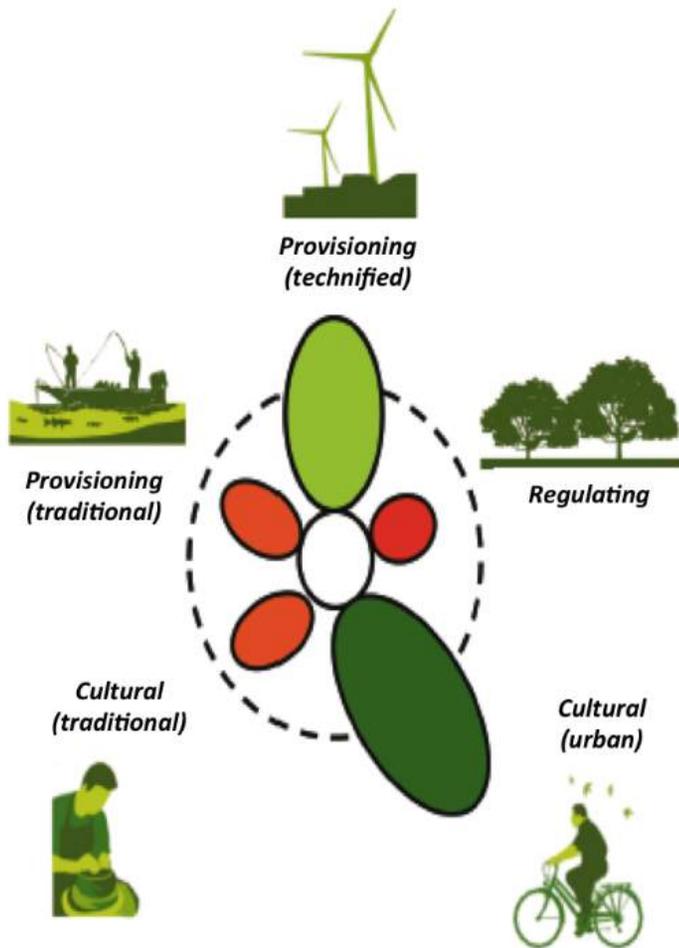
# Biophysical, Social and Economic results



# ES Biophysical Assessment



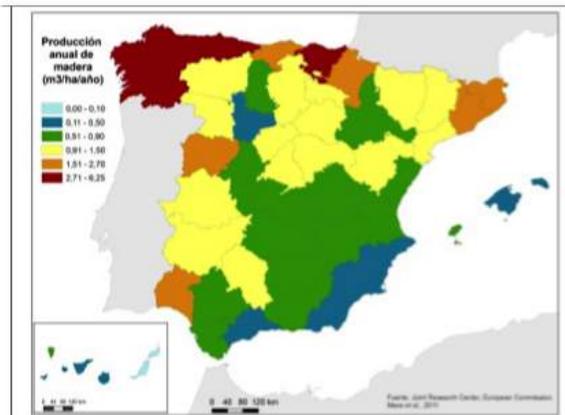
# Biophysical Key findings



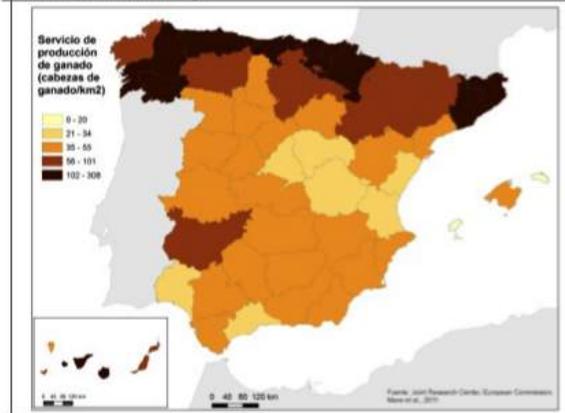
63% of provisioning  
87 % of regulating and 29% of  
cultural services has been  
degraded

# ES Mapping

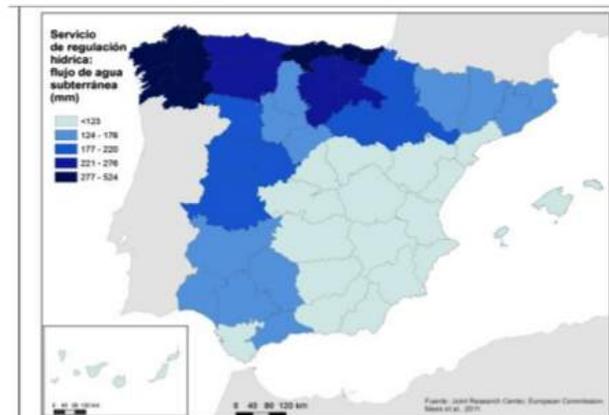
## 7 Provisioning



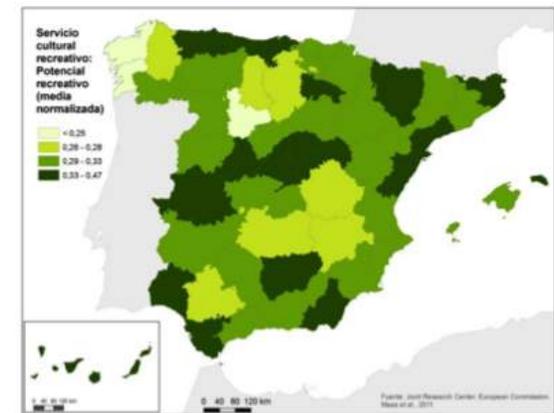
## Producción, flujo



## 12 Regulation



## 1 Cultural

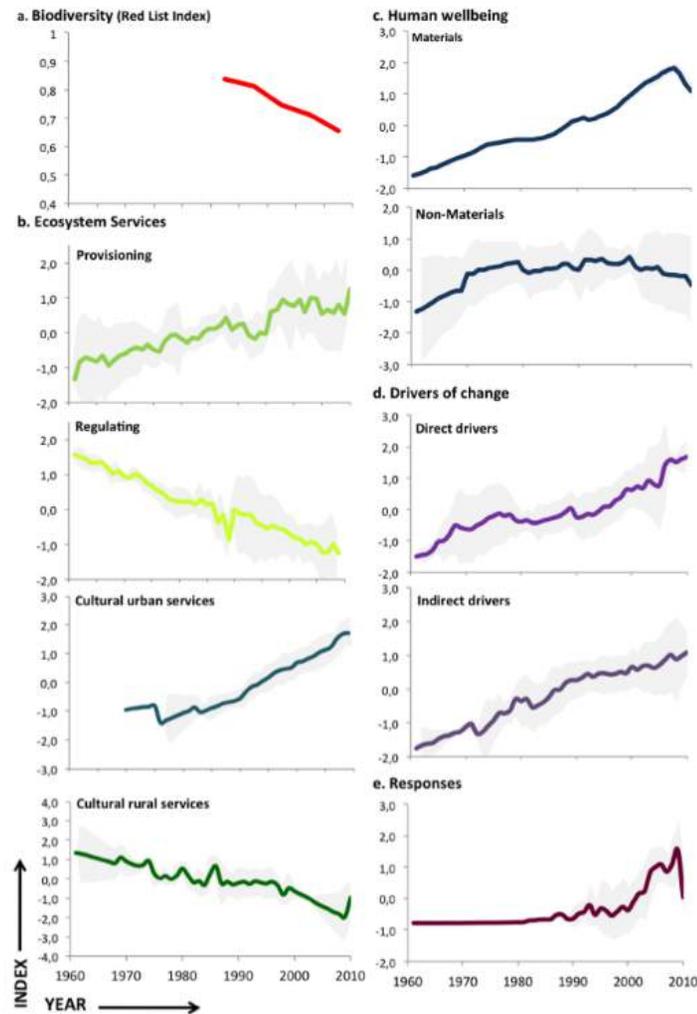


JRC (Joint Research Centre, 2011)

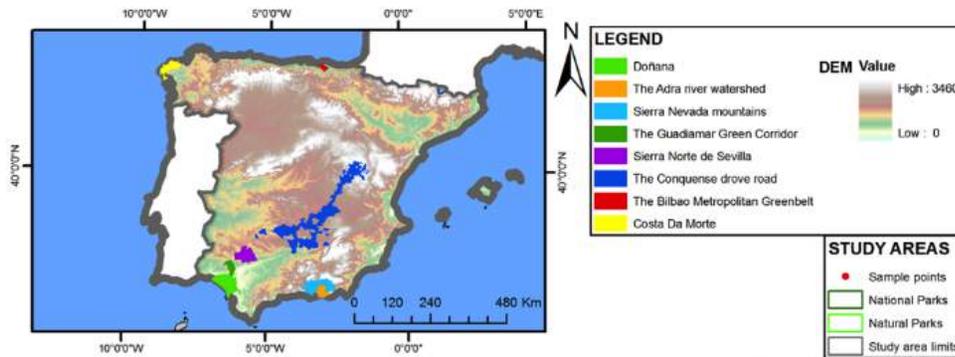
# Main drivers of change

Ecosystem services		Trend	Importance	Status*	Indicators	Direct drivers of change						
						Land use change	Climate change	Pollution	Biochemical cycles	Over-exploitation	Invasive alien sp.	
PROVISIONING	Food	Agriculture	↗	■	◆◆	Production of cereals, fruit and olive	✓	✓		✓	✓	✓
		Livestock	↗	■	◆◆	Production of meat		✓		✓	✓	✓
		Beekeeping	↔	■	◆	Production of <i>Apis mellifera</i>		✓				✓
		Aquiculture	↗	■	◆◆	Total aquaculture production					✓	
	Water	↔	■	◆	Water harvesting for human use	✓	✓	✓	✓	✓		
	Biotic materials	Wood	↗	■	◆	Wood production	✓			✓	✓	✓
		Paper	↔	■	◆	Paper pulp production	✓			✓	✓	✓
	Geotic materials	↔	■	◆	Cement production	✓				✓		
	Energy	↔	■	◆	Installed hydroelectric power		✓			✓		
	Gene pool	↘	■	◆◆	Based on Ecosystem Assessment	✓					✓	
Natural medicines	↘	■	◆	Based on Ecosystem Assessment		✓			✓			
REGULATING	Clima regulation	↘	■	◆◆	CO <sub>2</sub> Ratio of emissions and sequestration	✓	✓	✓	✓	✓		
	Air quality	↔	■	◆	Greenhouse gas emissions	✓	✓	✓	✓	✓		
	Hydrological and water depuration	↘	■	◆◆	Water in soil, snow, groundwater and self-cleaning capacity	✓	✓	✓	✓	✓	✓	
	Erosion control	↘	■	◆◆	Based on Ecosystem Assessment	✓	✓					
	Soil fertilization	↘	■	◆◆	Nitrogen fertilizers	✓		✓	✓	✓	✓	
	Disturbance regulation	↘	■	◆◆	Forest fires	✓	✓		✓	✓	✓	
	Biological control	↘	■	◆◆	Number of alien exotic species	✓	✓	✓	✓		✓	
	Pollination	↔	■	◆	Based on Ecosystem Assessment	✓	✓	✓			✓	
CULTURAL	Scientific knowledge	↗	■	◆◆	Number of Spanish scientific publications on ecosystems	✓	✓	✓				
	Recreational activities	↗	■	◆◆	Number of tourist accommodations, visitors and overnight stays	✓	✓	✓				
	Aesthetic value	↔	■	◆	Based on Ecosystem Assessment	✓	✓					
	Environmental education	↗	■	◆◆	Equipment for environmental education		✓	✓		✓	✓	
	Local ecological knowledge	↘	■	◆◆	Traditional use of cork and sheep transhumance	✓				✓	✓	
	Spiritual value	↗	■	◆◆	Based on Ecosystem Assessment	✓		✓				
	Sense of belonging	↘	■	◆	Based on Ecosystem Assessment	✓					✓	

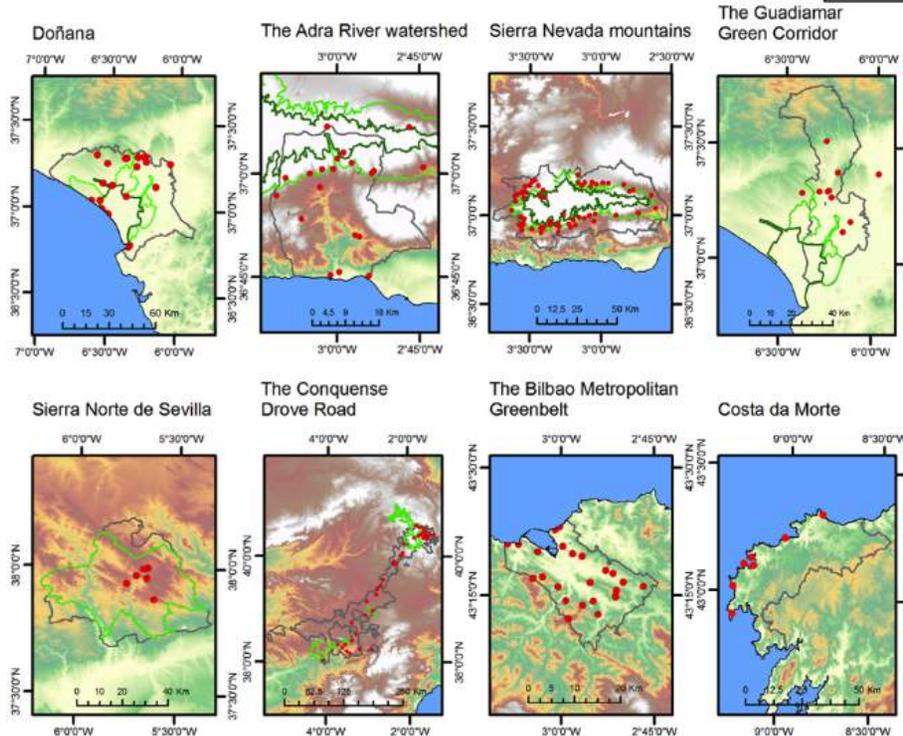
# Integration of DPSIR components



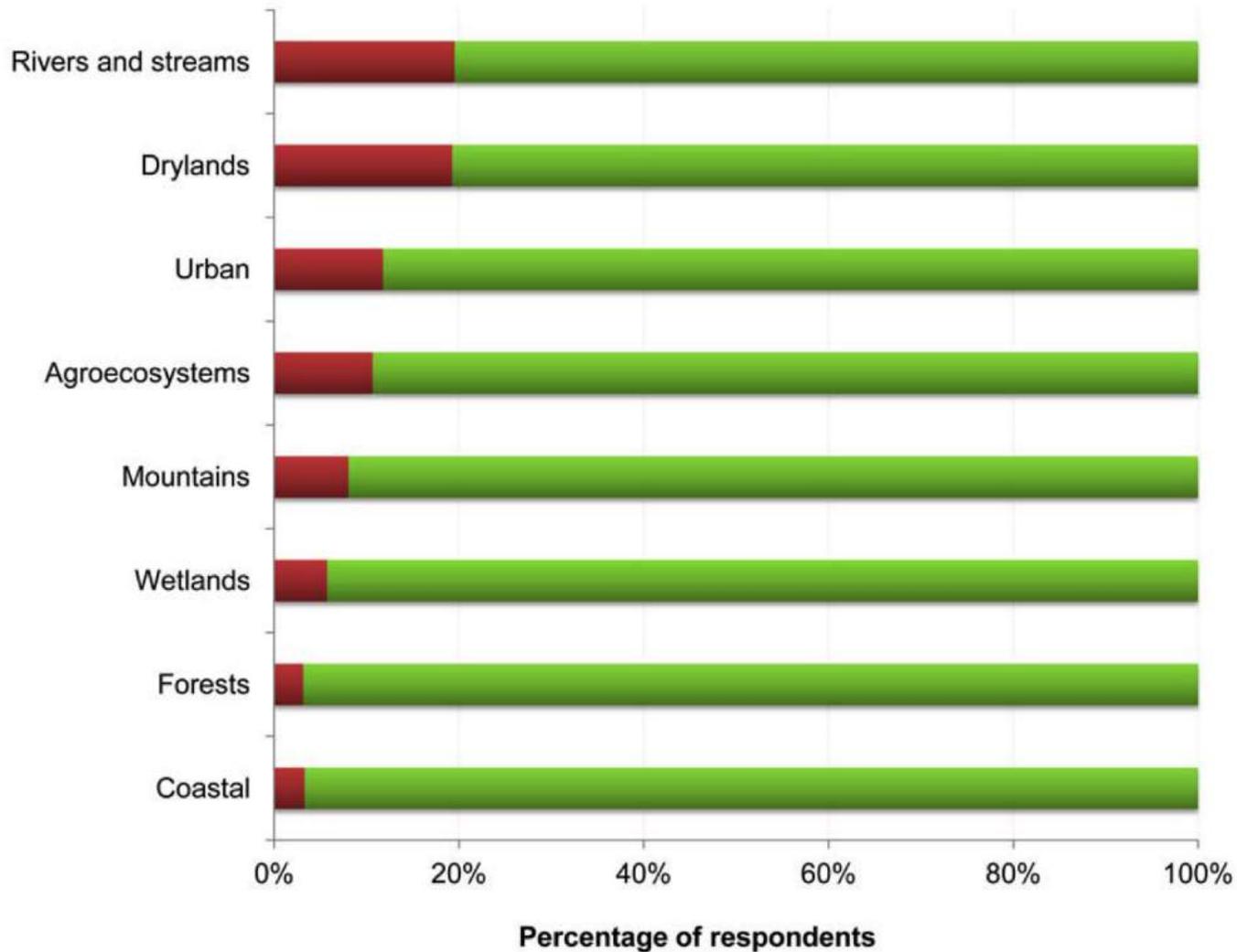
# ES Social assessment



Conducted 3,379 direct face-to-face questionnaires in eight different case study sites



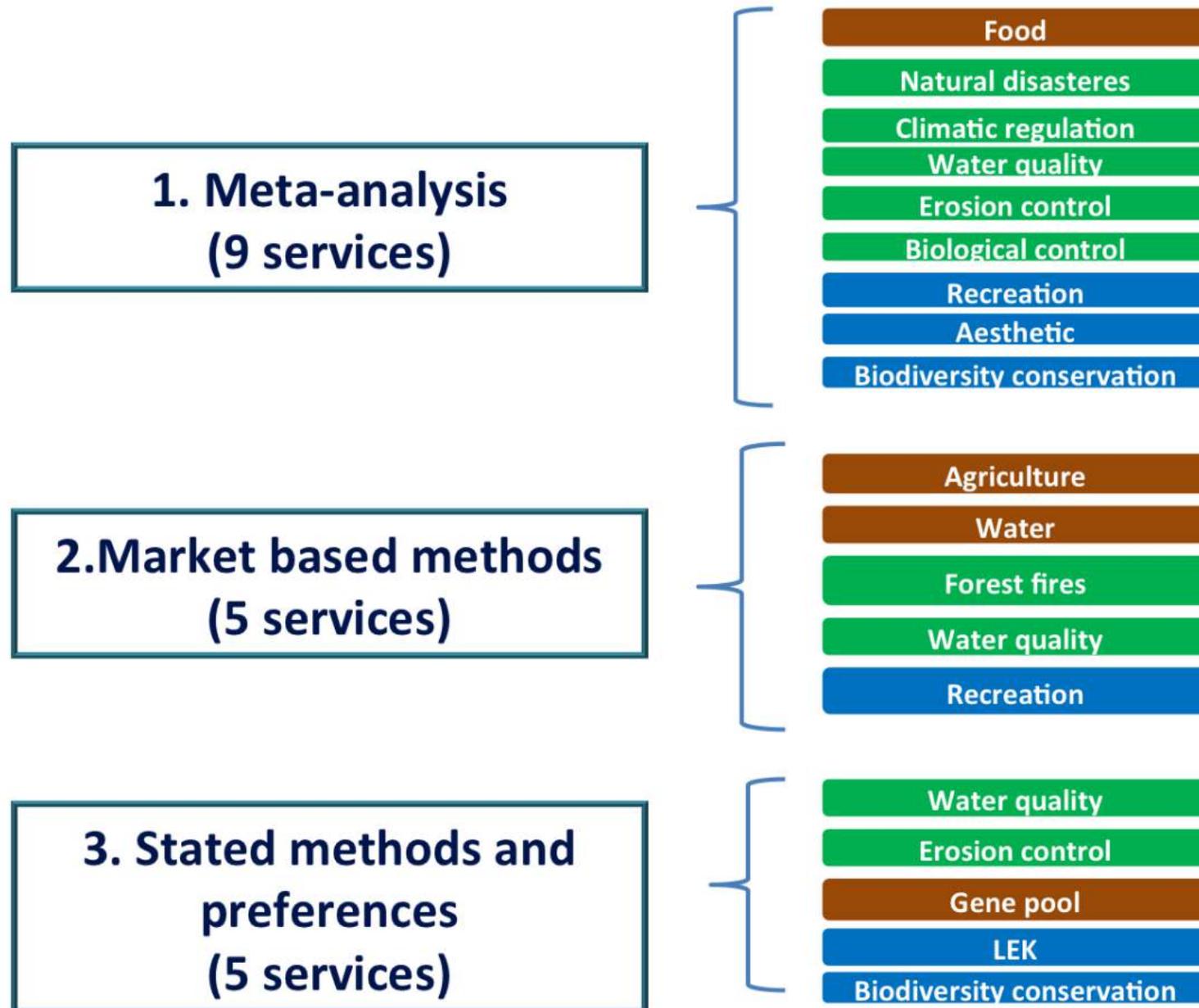
# ES Social Preferences



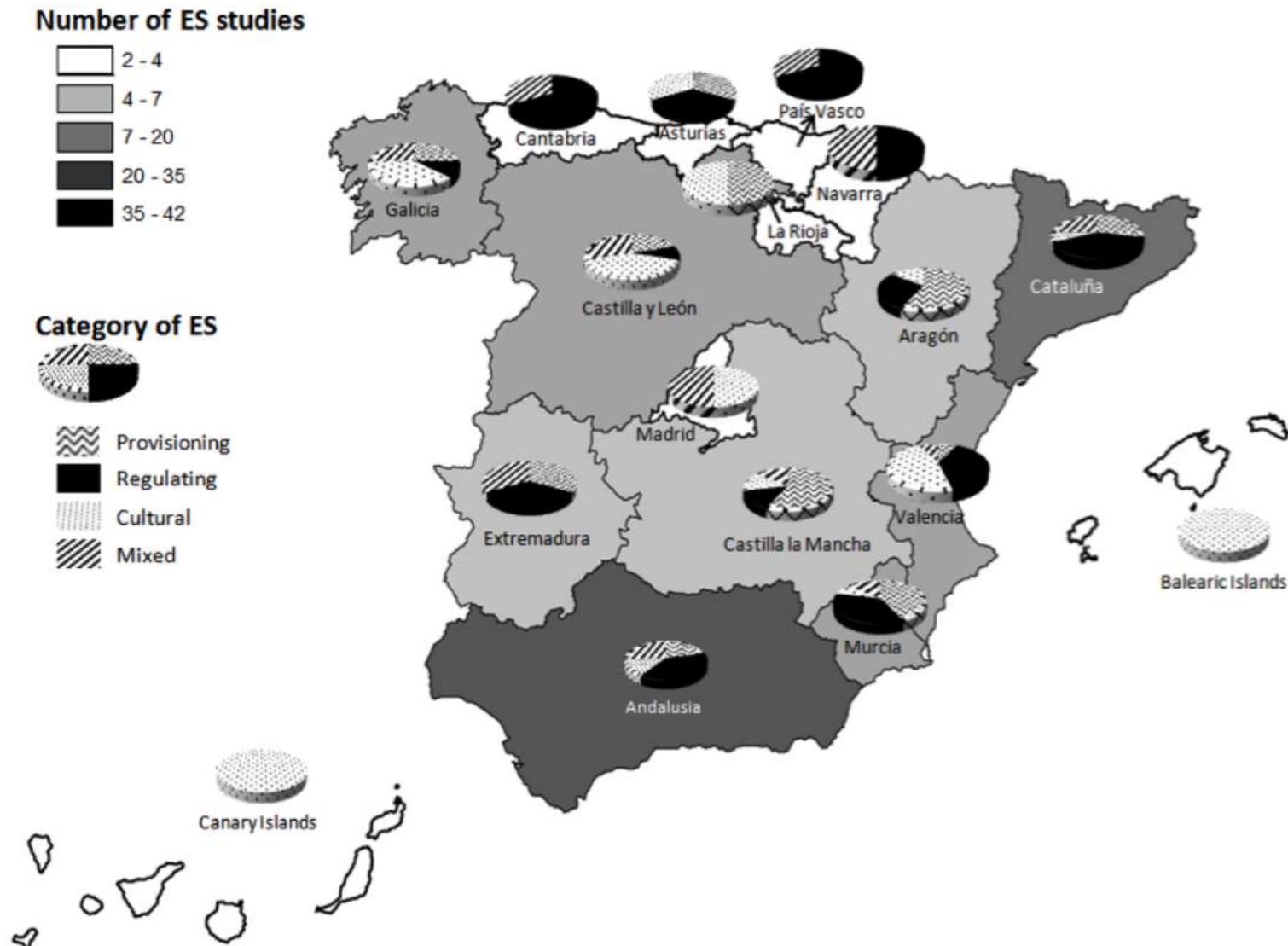
■ Non-perceived ecosystem services

■ Perceived ecosystem services

# ES Economic Assessment



# Meta-analysis: State of the art of ES economic valuation



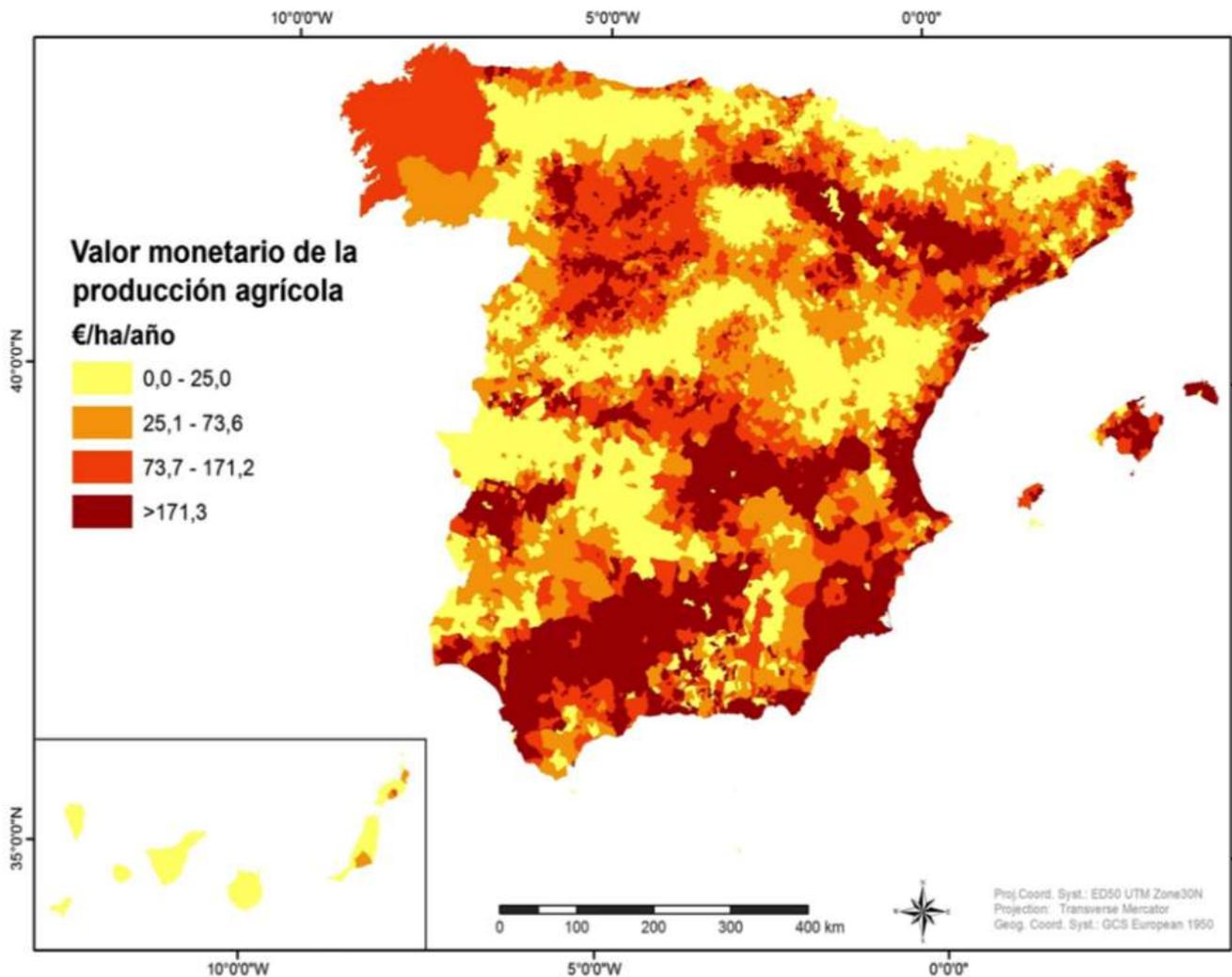
# Stated preference methods: Choice experiment

Tarjeta 1 de 9 (bloque 1)			
	Opción de futuro 1	Opción de futuro 2	Opción futuro 3: Mantener tendencia actual
CALIDAD de AGUA de los RÍOS y sus RIBERAS	RESTAURACIÓN 84% tiene buen y muy buen estado	COMO HOY 58% tiene buen y muy buen estado	COMO HOY 58% tiene buen y muy buen estado
CONOCIMIENTO ECOLÓGICO LOCAL	PRESERVACIÓN Puesta en valor y reconocimiento	COMO HOY Pérdida de conocimiento y abandono de prácticas	COMO HOY Pérdida de conocimiento y abandono de prácticas
ESPECIES AMENZADAS	COMO HOY 20% de especies protegidas	CONSERVACIÓN TOTAL 95% de especies protegidas (anfibios, aves, reptiles, peces, invertebrados, mamíferos, plantas)	COMO HOY 20% de especies protegidas
CONTROL de la EROSIÓN del SUELO	COMO HOY 64% superficie con baja erosión	RESTAURACIÓN 70% superficie con baja erosión	COMO HOY 64% superficie con baja erosión
RAZAS GANADERAS AUTÓCTONAS	COMO HOY 70% de razas con programas de mejora	MEJORA 95% de razas con programas de mejora	COMO HOY 70% de razas con programas de mejora
COSTE por HOGAR (impuestos extras) PERIODO 2014-2020	70€/hogar Al año y hasta 2020	10€/hogar Al año hasta 2020	0€/hogar NO se llevarán a cabo las propuestas
Yo prefiero:	<input type="checkbox"/> (pinchar abajo "opción futuro 1")	<input type="checkbox"/> (pinchar abajo "opción futuro 2")	<input type="checkbox"/> (pinchar abajo "mantener")

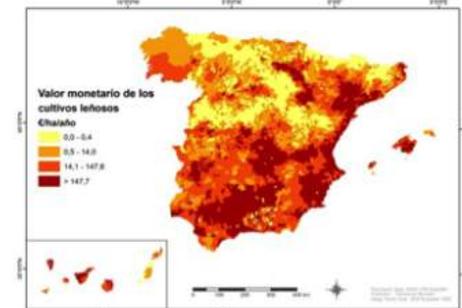
On-line survey with 800 valid questionnaires  
 Representative of the Spanish population  
 Sampling error <5%

# Market based Methods

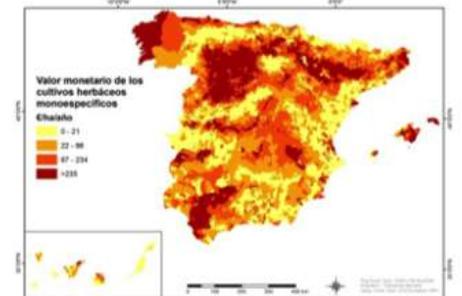
## Total (€/ha/año)



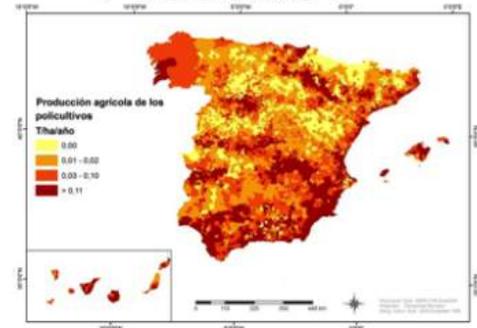
## Woody crops



## Monoespecific



## Policulture



# ES Economic Values

		VALOR ECONÓMICO MEDIO (Min - Max)		
		MERCADOS (€/ha/año)	METAANALISIS (€/ha/año)	MODELOS DE ELECCIÓN (€/hogar/año)
Abastecimiento	1. Alimentos	166.4 (0.1 – 8.100)	371.04 (0.91 -1972.65)	
	2. Agua	3.717 875 – 23.000		
	3. Acervo genético			16.35 (12.41- 20.28)
Regulación	4. Regulación climática		181.35 (0.01 -528.44)	
	5. Depuración hídrica	3.717 (875 – 23.000)	135.31 (0.01- 1970.31)	32.58 (27.05-38.11)
	6. Control de la erosión		31.99 (0.87- 234.72)	14.05 (9.85-18.24)
	7. Perturbaciones naturales	1.75 (0.1- 2.700)	262.83 (1.99-1364.45)	
	8. Control biológico		15.43 (0.15 - 56.30)	
Cultural	9. Recreativo o turismo	41 (1- 700)	186.36 (0.44 -1836.90)	
	10. Conocimiento local			14.50 (9.54-19.46)
	11. Sentimiento espiritual		6.26 (0.12-100.03)	22.50 (9.38-25.62)
	12. Disfrute estético		84.84 (0.41- 1871.99)	

Policy

# EU Assessments

## Country case studies

Belgium

Czech Republic

France

Germany

Norway

Poland

Portugal

Romania

Spain

Switzerland

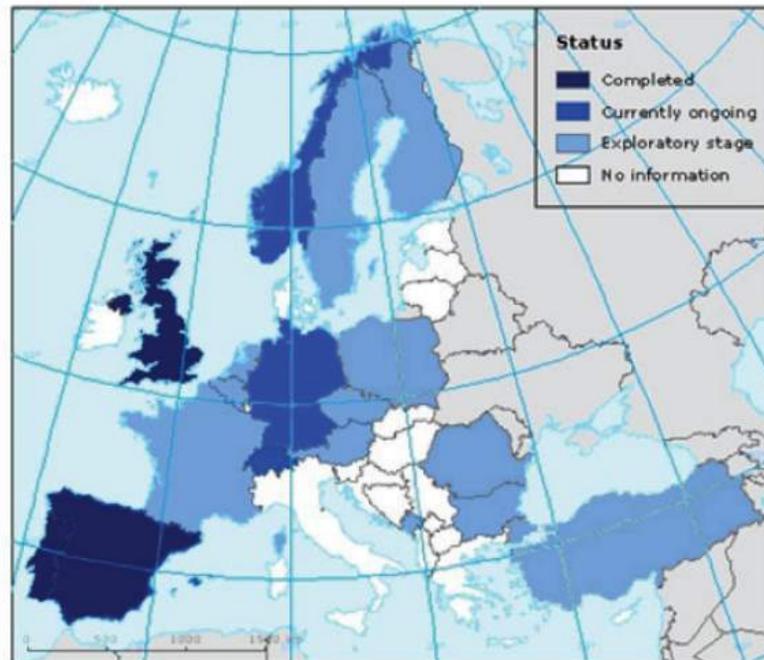
Turkey

United Kingdom

This section aims at recording case studies within Europe. Information, initially collected through a survey conducted in 2010 ([Ecosystem assessments in Europe, 2010 report](#)), is regularly updated based on additional information received from countries (cf "[Ecosystem assessments in Europe Update - June 2011](#)").

For some countries, more information is available by clicking on the map. The case-studies here documented reflect the diversity of approaches and activities among countries.

### Status of national ecosystem assessments in EEA member countries



*If you would like to provide (or update) the information about the initiatives you are involved in, please contact us.*

- Three EEA member countries have completed a national ecosystem assessment: [Portugal](#), [Spain](#) and [UK](#);
- Three EEA member countries are working on national ecosystem assessment: [Switzerland](#), [Germany](#) and [Norway](#);
- And 12 EEA member countries are in an exploratory stage: [Austria](#), [Belgium](#), [Bulgaria](#), [Czech Republic](#), [France](#), [Finland](#), [Montenegro](#), [Netherlands](#), [Poland](#), [Romania](#), [Sweden](#) and [Turkey](#).

# Spain contribution to the EU biodiversity strategy



Are Europe's ecosystems in good shape to continue delivering essential ecosystem services?



Can we value the flow of ecosystem services from ecosystems to society?

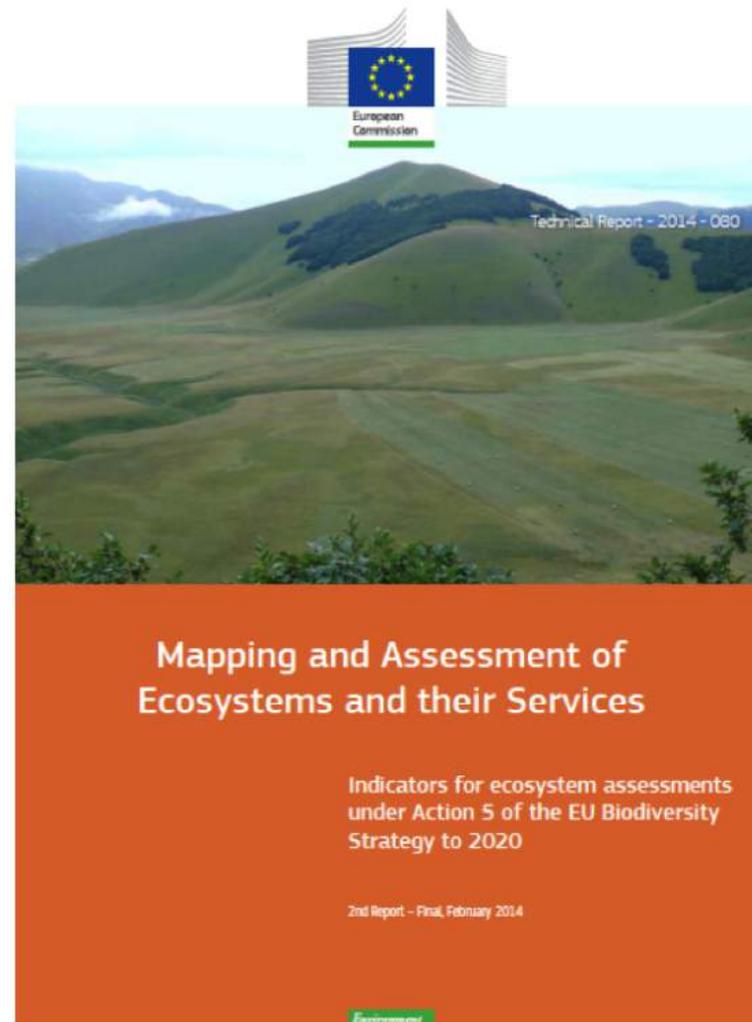
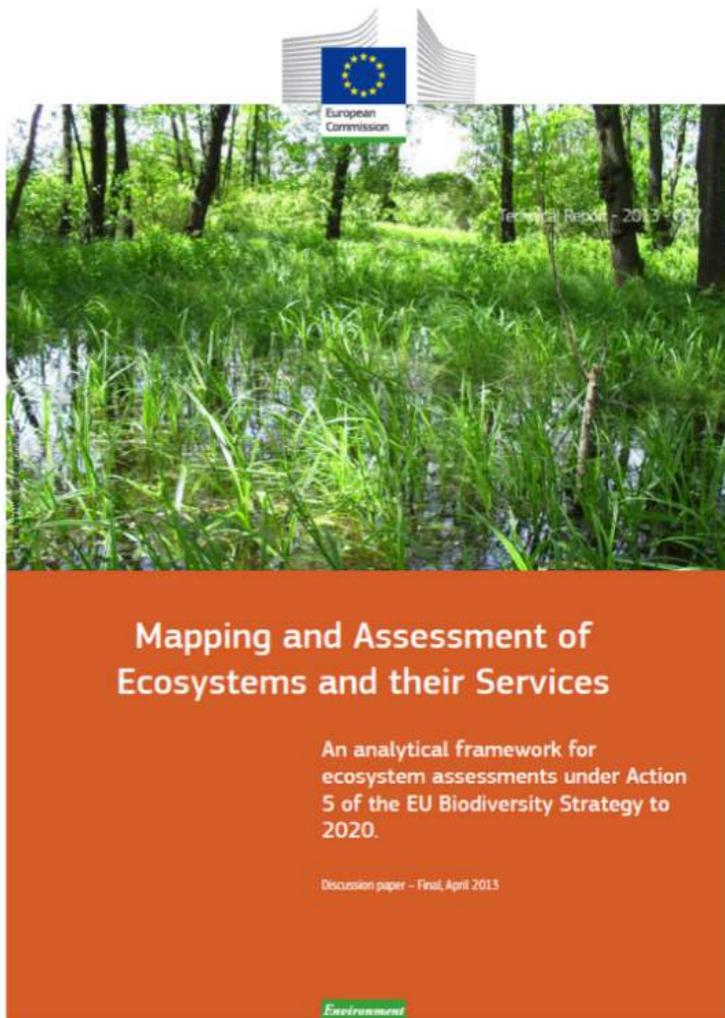


Which drivers of change increase or decrease the delivery of ecosystem services?

**We need to map and assess ecosystems and their services**



# Spain contribution to the MAES WP



# MESEU: Leading role in the Mediterranean MS

<b>UK CEH</b>	<i>Ireland</i>	<i>Denmark</i>	<i>Sweden</i>	<i>Finland</i>	<i>Germany</i>
<b>Spain UAM</b>	<i>Portugal</i>	<i>Italy</i>	<i>Greece</i>	<i>Malta</i>	<i>CypruS</i>
<b>Austria UBA</b>	<i>Czech R</i>	<i>Slovak R</i>	<i>Croatia</i>	<i>Hungary</i>	<i>Slovenia</i>
<b>Belgium INBO</b>	<i>Luxemburg</i>	<i>France</i>	<i>Romania</i>	<i>Bulgaria</i>	<i>Poland</i>
<b>Netherlan ds ALTERRA</b>	<i>Estonia</i>	<i>Lithuania</i>	<i>Latvia</i>	<i>Israel</i>	

# Contributions to IPBES: Assessment catalog, Deliverable 2a & 2b



[Home](#)

[About the Catalogue](#)

[Contact](#)

[Login to add/edit data](#)

## Spanish National Ecosystem Assessment *Spain*

[PRINT ASSESSMENT](#)

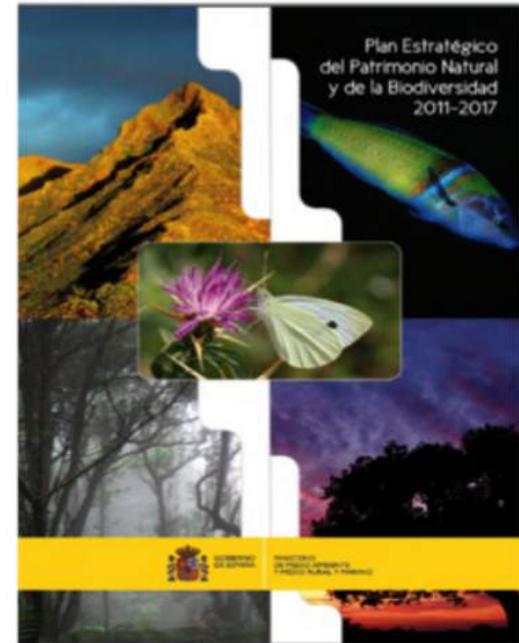
[DOWNLOAD EXCEL](#)

### Geographical coverage

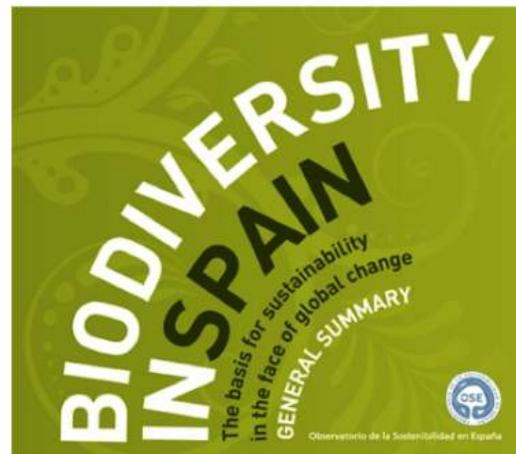
A light blue world map serves as the background for the table. On the left side of the map, there is a vertical toolbar with two square icons: the top one is a white square with a grey border, and the bottom one is a grey square with a white border.

Geographical scale of the assessment	National
Country or countries covered	Spain
Any other necessary information or explanation for identifying the location of the assessment, including site or region	Europe

# Linking EU and Spanish biodiversity strategy



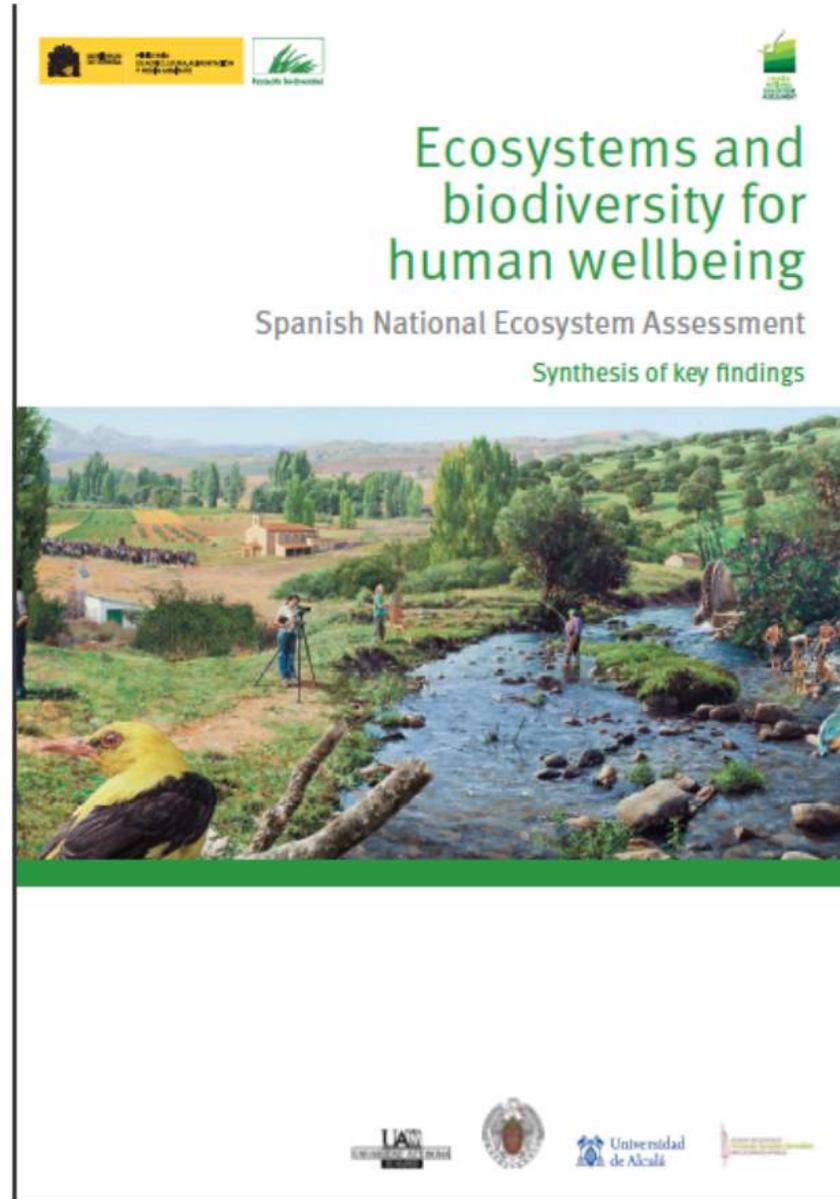
# Contributions to other assessments in Spain





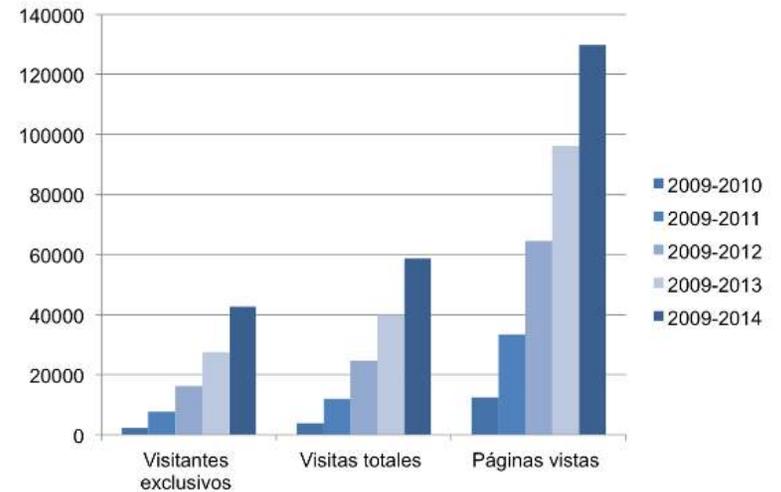
# Communication

# SYNTHESIS OF BIOPHYSICAL ASSESSMENT



# www.ecomilneo.es

Totales desde la creación de la web



# Communication materials

BOLETÍN Nº11

Primavera-Verano 2014



EVALUACIÓN  
DE ECOSISTEMAS  
DEL MILENIO  
DE ESPAÑA



Fundación Biodiversidad

## Editorial

POR EQUIPO DE COMUNICACIÓN DE EME



**Nuevo proyecto: Evaluación del servicio de la pesca en el contexto de los ecosistemas acuáticos de España.**

El proyecto de investigación aplicada "Evaluación del servicio de la pesca en el contexto de los ecosistemas acuáticos de España" se enmarca, conceptual y metodológicamente, en el proyecto la Evaluación de los Ecosistemas del Milenio de España ([www.ecomilenio.es](http://www.ecomilenio.es)) que ha evaluado el estado de los servicios de los ecosistemas y su incidencia en el bienestar humano a escala estatal en los últimos 50 años.

[Leer completo](#)



RESUMEN DEL ESTADO DEL PROYECTO

### Finaliza el EMEC

El proyecto de investigación aplicada "VALORACIÓN ECONÓMICA DE LOS SERVICIOS DE LOS ECOSISTEMAS SUMINISTRADOS POR LOS ECOSISTEMAS DE ESPAÑA" ha finalizado su andadura en junio de 2014. Durante los próximos meses se van a presentar los resultados y los informes técnicos correspondientes a las distintas entidades que nos han apoyado durante estos dos últimos años. Este proyecto se enmarca, conceptual y metodológicamente, en el proyecto "La Economía de los ecosistemas y la Biodiversidad" (TEEB en sus siglas en inglés, <http://www.teebweb.org/>).

[Leer resumen completo](#)

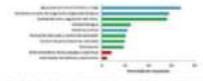


Figura 2. Distribución de los recursos económicos del proyecto de Evaluación de los Ecosistemas del Milenio de España.

**CASO DE ESTUDIO**  
**Valoración socio-económica de servicios de los ecosistemas**

## Destacados

**Materiales educativos de la "Evaluación de los Ecosistemas del Milenio de España"**



**Guía del profesorado de los materiales educativos de la "Evaluación de los Ecosistemas del Milenio de España"**



**EME participa en el 2º informe de "Mapping and Assessment of Ecosystems and their Services" (MAES)**

EVALUACIÓN DE LOS ECOSISTEMAS DEL MILENIO DE ESPAÑA (EME)

Material educativo



Lessons

Ecosystem assessments have revealed new possibilities for analyzing the complex relations between nature and human society.

There are some frameworks that can help simplify the complexity and help us figure out what to measure

There are some existing data sources that might help but the gaps are problematic

A key challenge to be addressed is developing comprehensive assessment frameworks, in which biophysical, socio-cultural, and economic value domains can be properly integrated

National ecosystem assessments provide evidence on the status and trends of ecosystem conditions with potential policy implications at different levels but it also have limitations

More structural changes are required in the Spanish institutional framework to reach 2020 biodiversity international targets



Ecosystem assessments have revealed new possibilities for analyzing the complex relations between nature and human society.

There are some frameworks  
that can help simplify the  
complexity and help us  
figure out what to measure

There are some existing data sources that might help but the gaps are problematic

A key challenge to be addressed is developing comprehensive assessment frameworks, in which biophysical, socio-cultural, and economic value domains can be properly integrated

National ecosystem assessments provide evidence on the status and trends of ecosystem conditions with potential policy implications at different levels but it also have limitations

More structural changes are required in the Spanish institutional framework to reach 2020 biodiversity international targets

# thank you!

Dr. Fernando Santos Martín

Social-Ecological Systems Lab. Dpt. Ecology,  
Universidad Autónoma de Madrid, Spain

[fernando.santos.martin@uam.es](mailto:fernando.santos.martin@uam.es)

[www.ecomilenio.es](http://www.ecomilenio.es)

[www.uam.es/Sociecosistemas](http://www.uam.es/Sociecosistemas)



Assessment

Policy

Spanish NEA:  
From research applications  
to policy implications



Lessons



Research

Communication