STATI GENERALI della Green Economy 2014

5 e 6 novembre 2014

Sessione Tematica
"Capitale naturale: contabilità e responsabilità degli attori"

From knowledge of ecosystems and their services to environmental accounting

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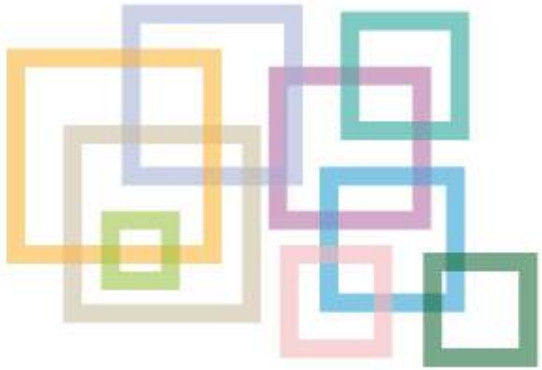


Understanding the **value of nature** by analysing ecosystem structure and function

Assessing the **conservation status** of ecosystems

Highlighting the importance of **agrobiodiversity** and of **green infrastructures**

Using **ecological land classification** to define landscape characteristics, vulnerability and vocation

Appreciating **protected areas** as biodiversity sources with high economic value

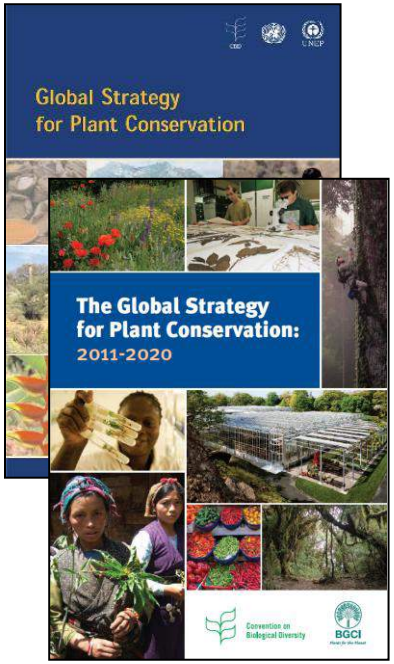
Monitoring loss of agricultural and natural areas in quali-quantitative terms

Understanding the **value of nature** by analysing ecosystem structure and function

The Global Policy framework

Convention on Biological Diversity - 1992

The ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way (COP 5, 2000)



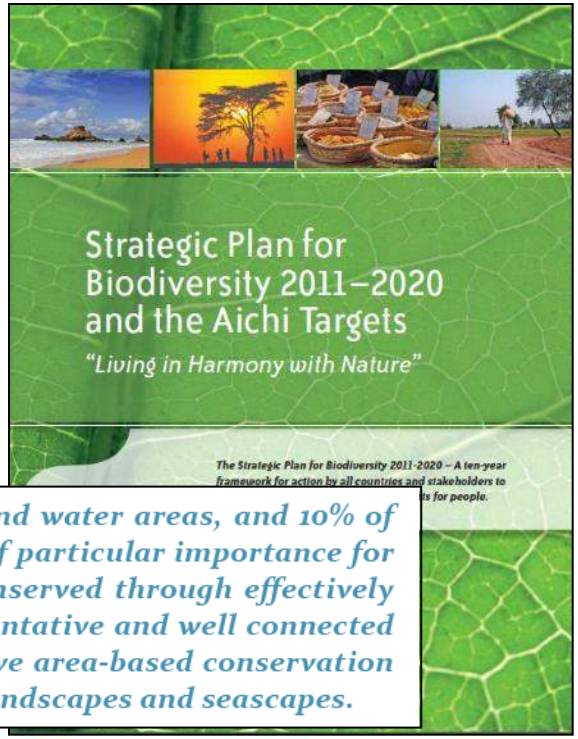
Global Strategy for Plant Conservation

First adoption: 2002

Last update: 2010

Aichi Targets

In 2010, the CBD Parties adopted the **Strategic Plan for Biodiversity 2011–2020**, including a set of 20 headline targets known as **Aichi Biodiversity Targets**

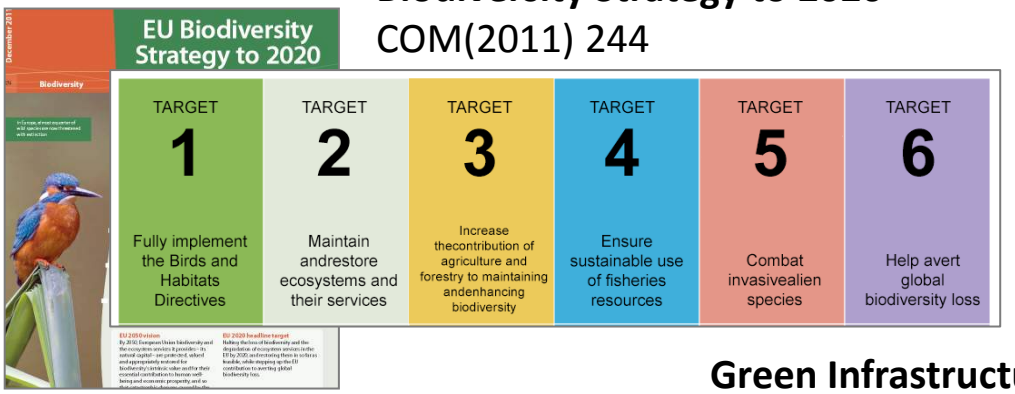


Target 11:

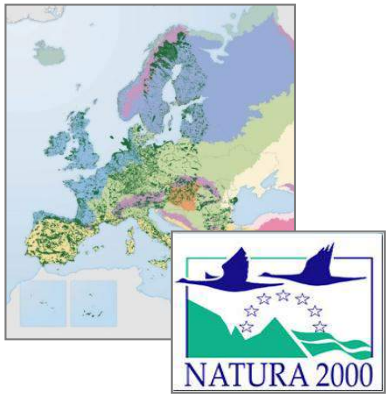
By 2020, at least 17% of terrestrial and inland water areas, and 10% of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

The European Policy framework

Biodiversity Strategy to 2020
COM(2011) 244

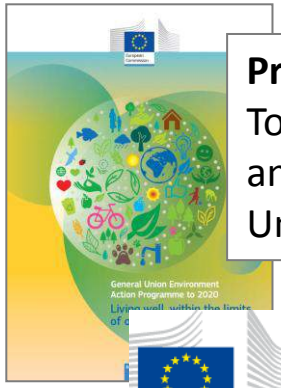


Habitats Directive and
Natura 2000 network



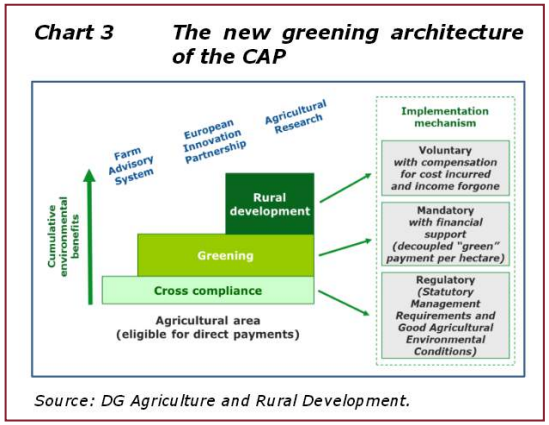
Green Infrastructure Strategy

7th Environment Action Programme (EAP)



Priority objective 1:
To protect, conserve and enhance the Union's natural capital

PAC 2014-2020
-Greening
- Agri-Environment Payments



Horizon 2020

Carta of Rome on Natural and Cultural Capital

italia2014.eu

Mapping and Assessment on Ecosystems and their Services (MAES)

The MAES project: Europe and Italy

http://biodiversity.europa.eu/maes/maes-catalogue-of-case-studies/ ecosystem-map-of-italy.pdf

A **Working Group on Mapping and Assessment on Ecosystems and their Services (MAES)** was set up under the Common Implementation Framework (CIF), to support the implementation of Action 5 by the EU and its Member States

Indicators for mapping and assessment of ecosystems and their services are based on

i) data availability
ii) ability to convey information to the policy making and implementation processes

First Report - Apr 2013

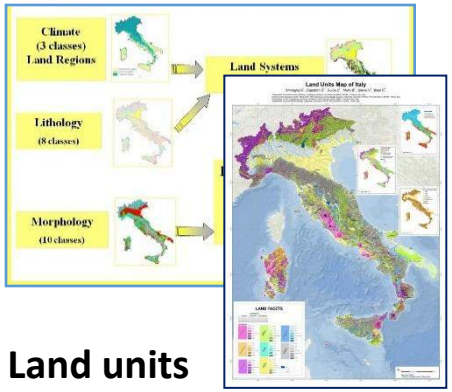
Second Report – Feb 2014

1 - Mapping

2 - Assessment

3 - Economic valuation

Recent national projects on environment and biodiversity



Land units

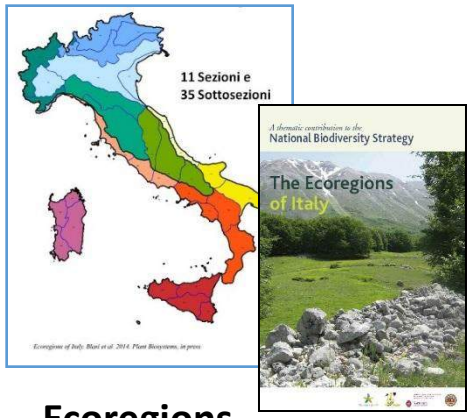
SMIRAGLIA D., et al 2013.
JOURNAL OF MAPS

Phytoclimate

Blasi and Michetti 2007
Biodiversity in Italy

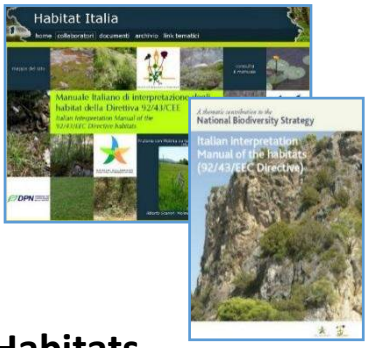
Potential Natural Vegetation

BLASI C. Ed. (2010).
Blasi et al . 2004 , **FITOSOCIOLOGIA** 41 (1), suppl. 1: 21-25



Ecoregions

Blasi et al., 2014 **PLANT BIOSYSTEMS**

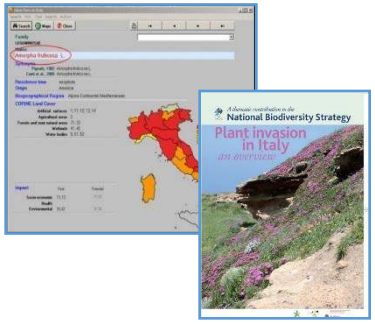


Habitats

Biondi E., C. 2012. **PLANT SOCIOLOGY**, 49(1), 5-37

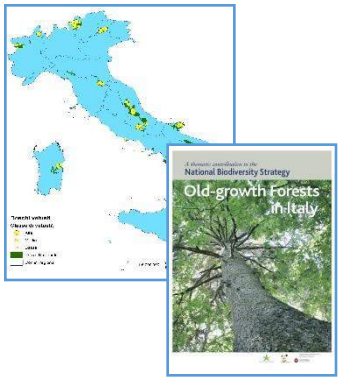
Important Plant Areas

BLASI C. et al (2011). **BIOLOGICAL CONSERVATION,** vol. 144, p. 220-226



Plant Invasion

L. Celesti-Grapow, 2009 **PLANT BIOSYSTEMS**



Old-growth forests

Blasi et al 2010**, PLANT BIOSYSTEMS**

Since the 90's a very high number of projects on Italian environmental heterogeneity and biodiversity have been completed through the cooperation between the Ministry of the Environment, Italian Botanical Society and the Sapienza University with the very high cooperation with the scientific community.

<u>This background knowledge allowed to build the current Map of Italian Ecosystems</u>

The first step of the MAES process in Italy – MAP ECOSYSTEMS

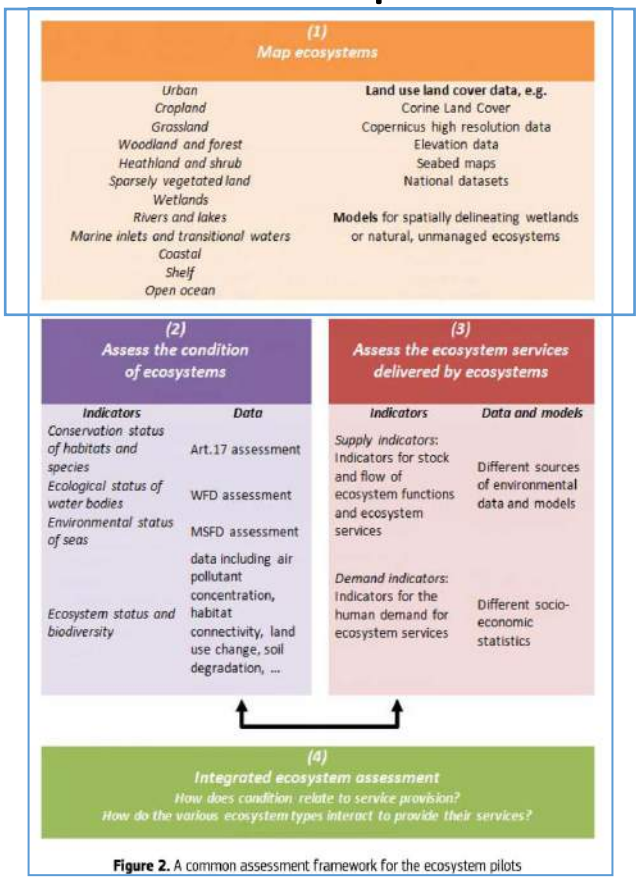
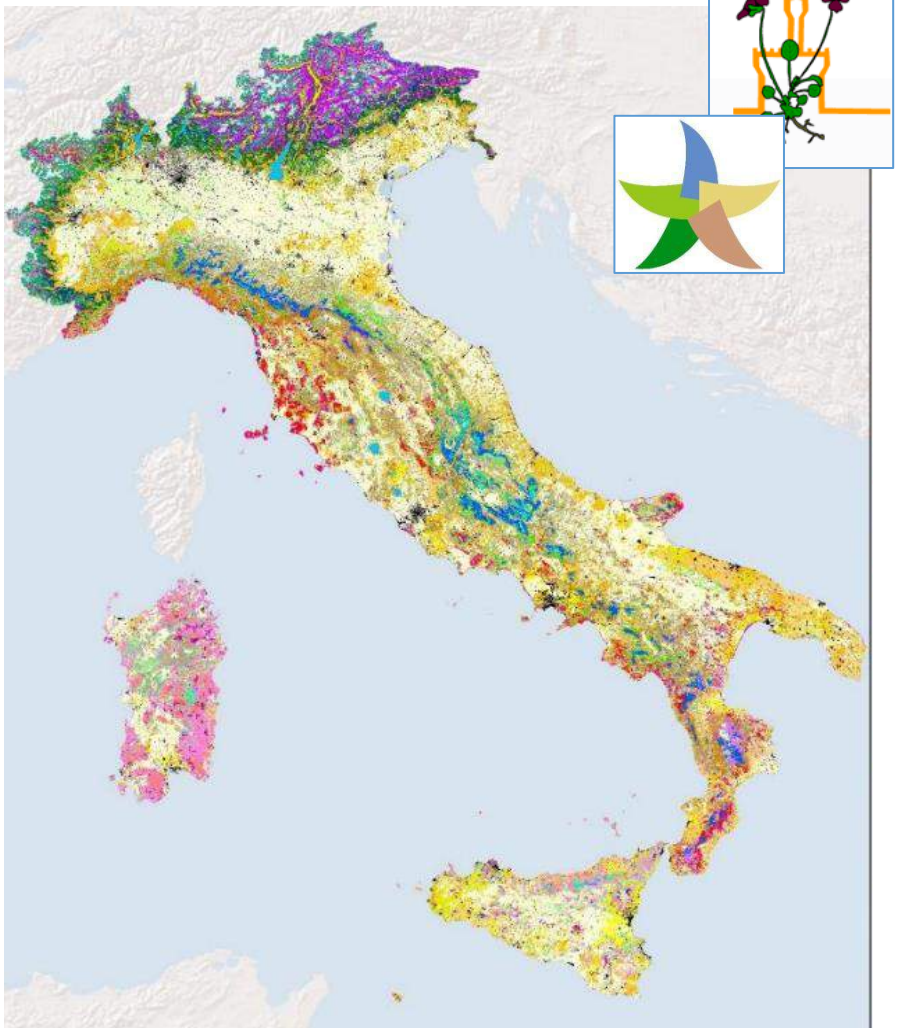


Figure 2. A common assessment framework for the ecosystem pilots

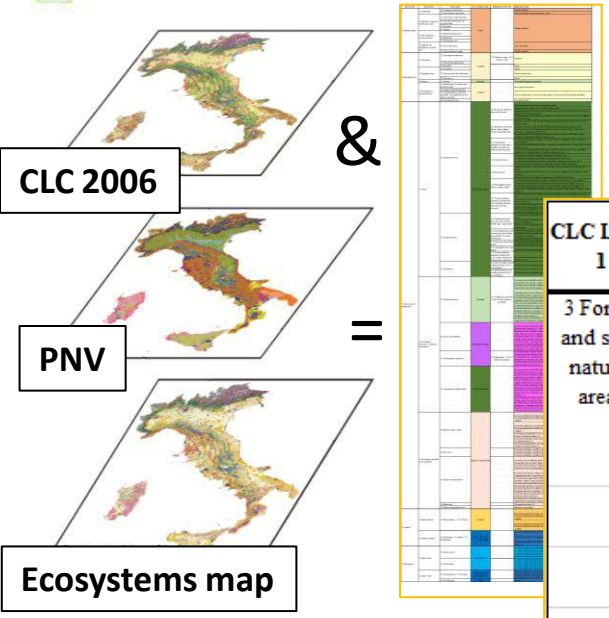
1st Italian Meeting on the MAES Working Group
Rome, Sapienza University 27.2.2014

Official presentation of the Italian MAES project
Bruxelles 06.3.2014



Ecosystem Map of Italy (1:100,000)

Legend of the Ecosystem Map of Italy



Correspondence between CLC classes - EU ecosystem types - Italian ecosystem types

CLC Level 1	CLC Level 2	CLC Level 3	EU ecosystem types	Italian CLC Level 4 (5)	Italian Ecosystems
3 Forest and semi natural areas	31 Forests	311 Broadleaved forest	Woodland and forest	3111 Evergreen oak forests (holm and cork oaks)	SubMediterranean Quercus ilex woodlands of Insubria
					SubMediterranean Quercus ilex woodlands of the Po Plain
					Mediterranean and subMediterranean woodlands with Quercus ilex and/or Q. suber (in Salento, Q. calliprinos) of the Italian peninsula
					Mediterranean and subMediterranean woodlands with Quercus ilex, Q. suber and/or Q. calliprinos of Sicily and Sardinia
				3112 Deciduous oak forests (turkey, downy, Italian, sessile, pedunculate oaks)	Deciduous oakwoods of the Alps and Prealps (with Quercus petraea, Q. pubescens, Q. robur and/or Q. cerris)
					Deciduous oakwoods of the Po Plain (with Quercus robur, Q. petraea and/or Q. cerris)
					Decidous oakwoods of the Italian peninsula (with Quercus cerris, Q. robur, Q. petraea, Q. pubescens, Q. virgiliana, Q. frainetto, ecc.)
					Mediterranean and subMediterranean deciduous oakwoods of Sicily and Sardinia (with Q. virgiliana, Q. congesta, Q. ichnusa, Q. gussoni, etc.)
				3115 Beech forests	Montane beech forests with Picea abies, Abies alba, Sorbus aucuparia, etc. of the Alps and Prealps
					Montane beech forests with Abies alba, Taxus baccata, Ilex aquifolium, Acer lobelii, etc. of the Apennines
					Montane beech forests of Sicilian mountain ranges (Madonie, Nebrodi, Etna)
...	...	...	...	...	...

90 classes (36 are forests)

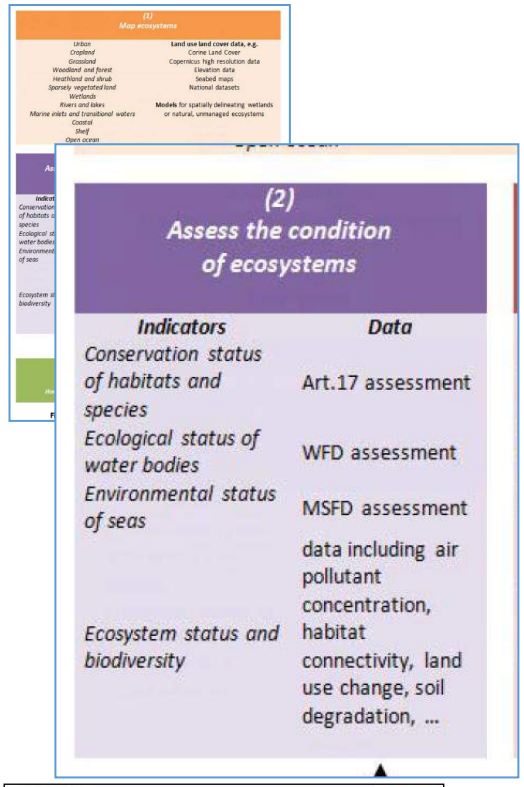
Minimum mapping unit **25ha**

Structure of the legend classes

FEATURES	Biogeography/ Bioclimate	Structure	Geographic location	Physiognomy
Example	Mediterranean and subMediterranean	deciduous oakwoods	of Sicily and Sardinia	with *Quercus virgiliana, Q. congesta, Q. ichnusa* etc.

Assessing the **conservation status** of ecosystems

The second step of the MAES process in Italy – ASSESSMENT THE CONDITION OF ECOSYSTEMS



for natural and semi-natural systems

vegetation dynamics

structural and compositional distance between the actual vegetation cover and the mature stage of the potential natural vegetation/PNV

for agricultural systems

cultural intensity

impact of agricultural practices on ecological resources and processes

for urban systems

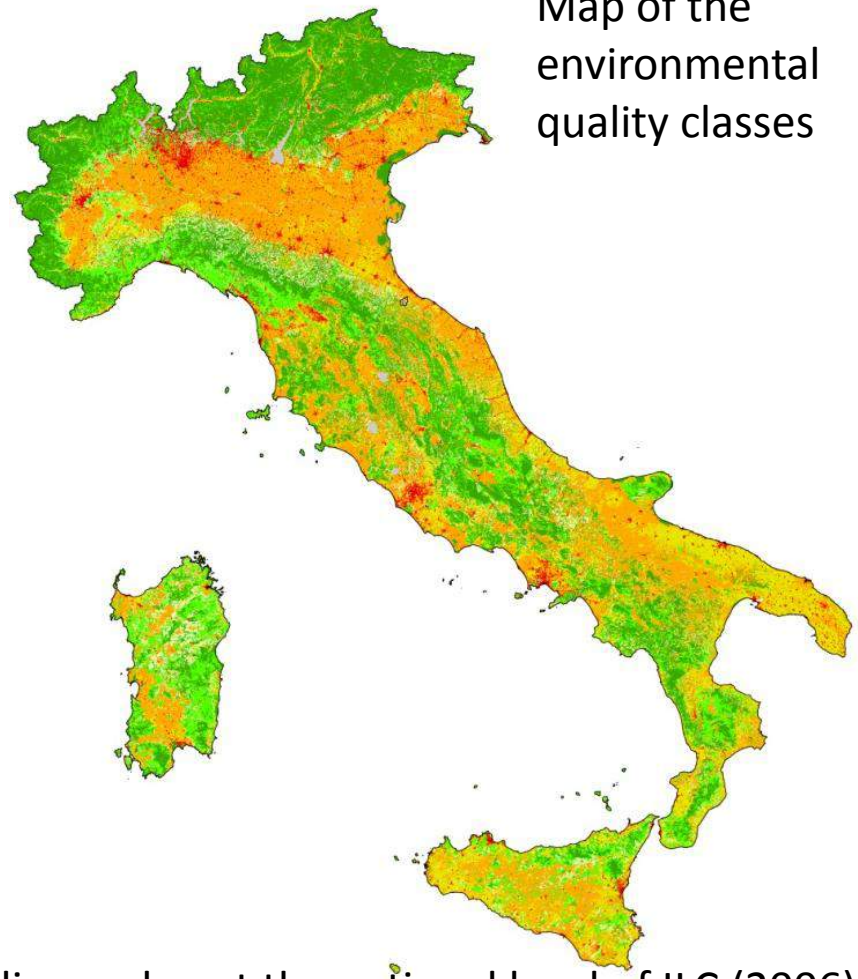
artificialisation

degree of soil sealing

Environmental quality (*conservation and environmental status*) of ecosystems and spatial indices of conservation status

Application within the MAES process in Italy

nr of ecosystem types	ecosystem groups (short name)	Quality classes 1	2	3	4	5	6	7	8	9	NV
1	Artificial										
1	Urban discont										
1	Urban green										
1	Arable										
1	Rice fields										
1	Vineyards										
1	Fruit trees										
1	Olive groves										
1	Arboriculture										
1	Pastures										
1	Heterog agric										
1	Agric with natural										
1	Agro-forestry										
4	Evergreen forests										
4	Deciduous oak forests										
3	Mixed mesophil forests										
4	Chestnut forests										
3	Beech forests										
4	Hygrophilous forests										
4	Non native broadleaf forests										
3	Mediterranean pine forests										
3	Mountain pine forests										
2	Fir/spruce forests										
2	Non native conifer forests										
8	Natural and open grasslands										
5	Mountain shrubs										
3	Maquis										
8	Transitional shrubs										
7	Open psammophilous/hygrophilous										
3	Rocky vegetation										
1	Glaciers/snow										
3	Inland wetland										
3	Halophilous										
4	Water courses										
4	Water bodies										
3	Coastal waters										



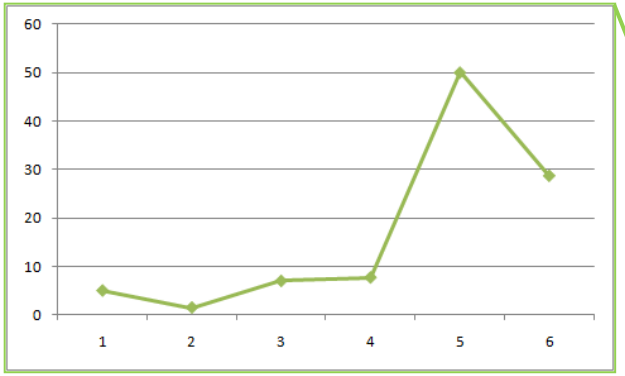
Map of the environmental quality classes

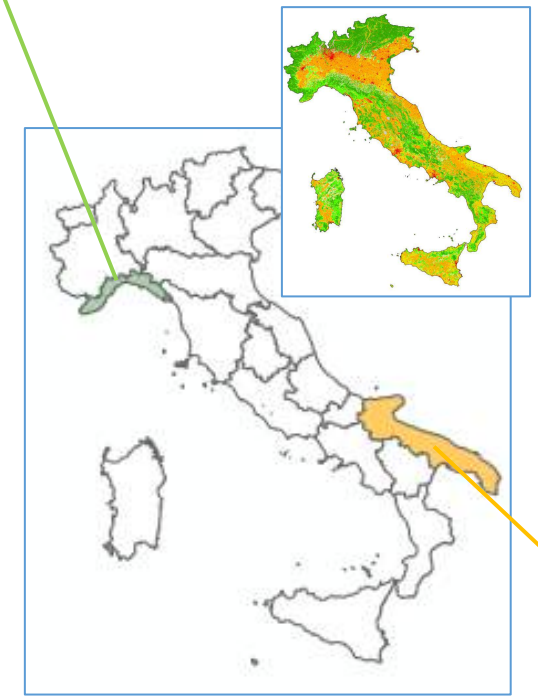
Medium value at the national level of ILC (2006) = 0.56 but with important variation at different locations

Environmental quality (*conservation and environmental status*) of ecosystems and spatial indices of conservation status

ILC based on the ecosystems of Italy

Comparison among administrative regions



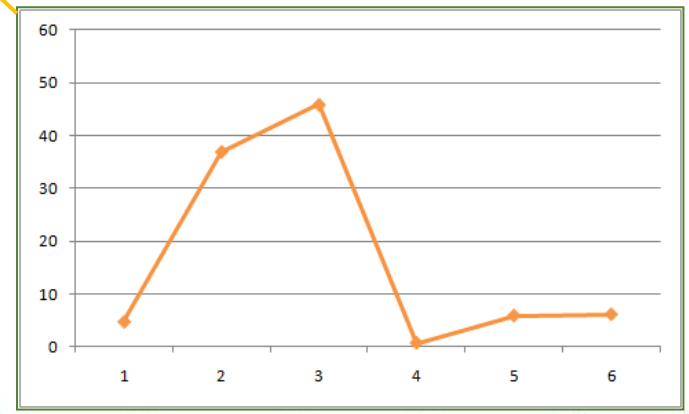


Liguria Region (NW Italy)

ILC (2006) = **0.77**

Puglia Region (SE Italy)

ILC (2006) = **0.37**



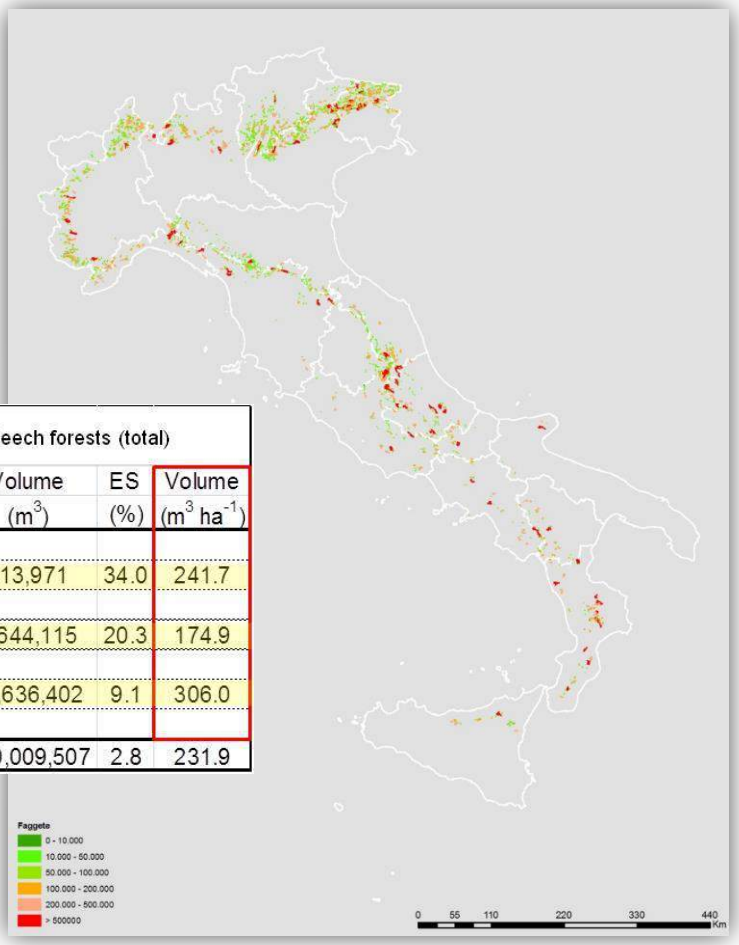
Analysis of Carbon stock and sink

Crosswalk CLC types – INFC types

Codice CLC	Descrizione legenda CLC	Codice INFC	Descrizione legenda INFC
3111	Bosco a prevalenza di leccio e sughera	**15 +16**	Leccete + Sugherete
3112	Bosco a prevalenza di querce caducifoglie	**9+10**	Boschi di rovere, roverella e farnia + Boschi di cerro, farnetto, fragno e vallonea
3113	Bosco a prevalenza di latifoglie mesofile	**12**	Ostrieti e carpineti
3114	Bosco a prevalenza di castagno	**11**	Castagneti
3115	Bosco a prevalenza di faggio	**8**	Faggete
3116	Bosco a prevalenza di specie igrofile	**13**	Boschi igrofili
3117	Bosco a prevalenza di latifoglie non native	**14**	Altri boschi caducifogli
3121	Bosco a prevalenza di pini mediterranei	**6**	Pinete di pini mediterranei
3122	Bosco a prevalenza di pini montani e oromediterranei	**4+5**	Pinete di pino silvestre, pino montano + Pinete di pino nero, pino laricio, pino loricato
3123	Bosco a prevalenza di abete bianco e/o abete rosso	**2+3**	Boschi di abete rosso + Boschi di abete bianco
3124	Bosco a prevalenza di larice e/o pino cembro	**1**	Boschi di larice - cembro
3125	Bosco a prevalenza di conifere non native	**7**	Altre formazioni di conifere, pure o miste
31311	Boschi misti a prevalenza di leccio	**15 +16**	Leccete + Sugherete
31312	Boschi misti a prevalenza di querce caducifoglie	**9+10**	Boschi di rovere, roverella e farnia + Boschi di cerro, farnetto, fragno e vallonea
31313	Boschi misti a prevalenza di latifoglie mesofile	**12**	Ostrieti e carpineti
31314	Boschi misti a prevalenza di castagno	**11**	Castagneti
31315	Boschi misti a prevalenza di faggio	**8**	Faggete
31316	Boschi misti a prevalenza di specie igrofile	**13**	Boschi igrofili
31317	Boschi misti a prevalenza di latifoglie non native	**14**	Altri boschi caducifogli
31321	Boschi misti a prevalenza di pini mediterranei	**6**	Pinete di pini mediterranei
31322	Boschi misti a prevalenza di pini montani e/o oromediterranei	**4+5**	Pinete di pino silvestre, pino montano + Pinete di pino nero, pino laricio, pino loricato
31323	Boschi misti a prevalenza di ab. bianco e/o ab. rosso	**2+3**	Boschi di abete rosso + Boschi di abete bianco
31324	Boschi a prevalenza di larice e/o pino cembro	**1**	Boschi di larice - cembro
31325	Boschi a prevalenza di conifere non native	**7**	Altre formazioni di conifere, pure o miste

Analysis of Carbon stock and sink

Beech forests



Administrative region	Beech forests (total)		
	Volume (m^3)	ES (%)	Volume (m^3 ha^{-1})

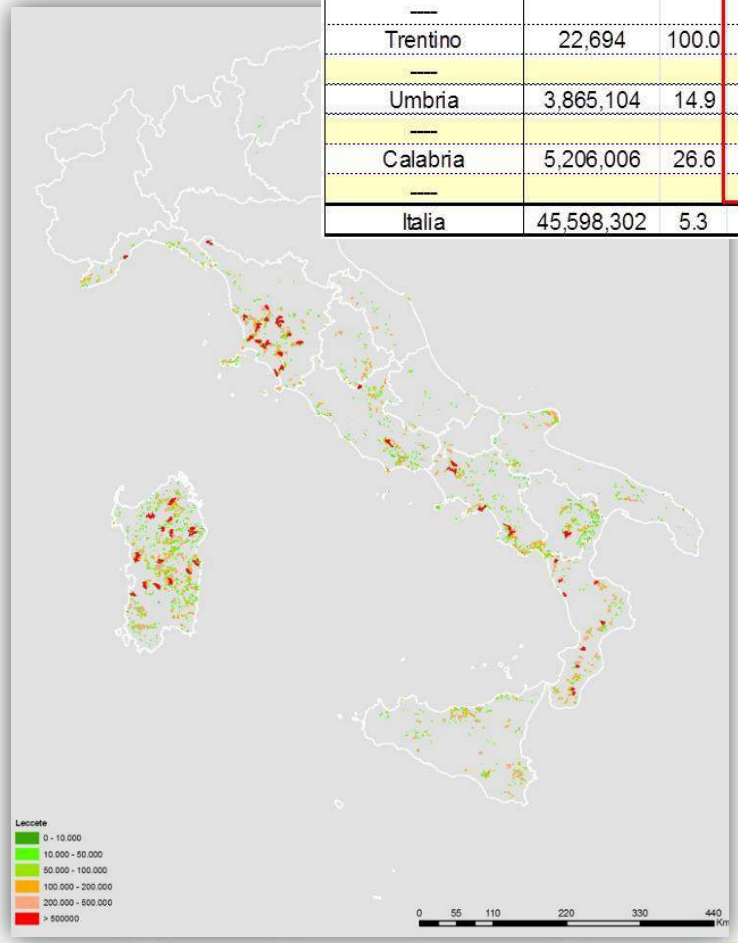
Alto Adige	913,971	34.0	241.7

Umbria	2,644,115	20.3	174.9

Calabria	23,636,402	9.1	306.0

Italia	240,009,507	2.8	231.9

Evergreen holm-oak woodland



Administrative region	Holm-oak woods (total)		
	Volume (m^3)	ES (%)	Volume (m^3 ha^{-1})

Trentino	22,694	100.0	63.0

Umbria	3,865,104	14.9	97.1

Calabria	5,206,006	26.6	119.3

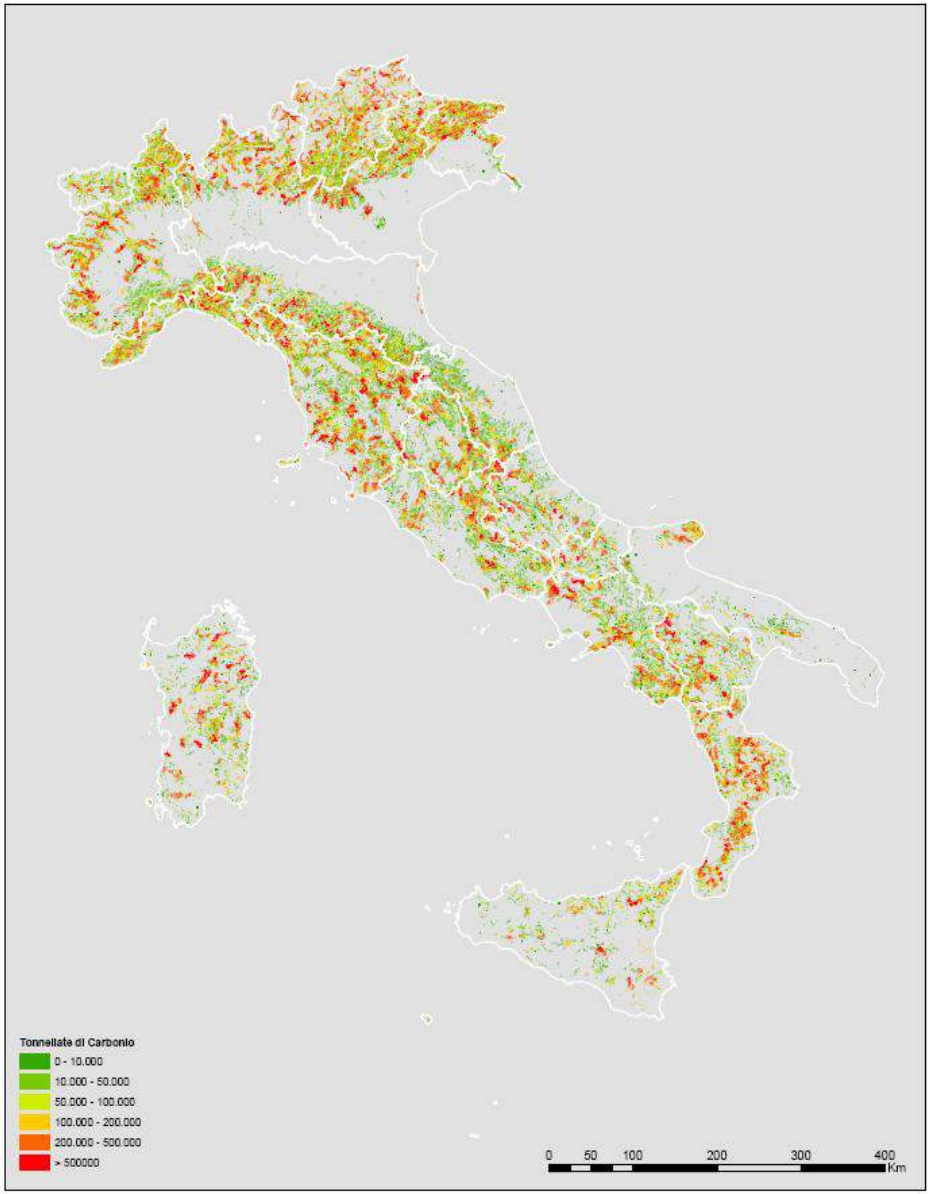
Italia	45,598,302	5.3	73.5

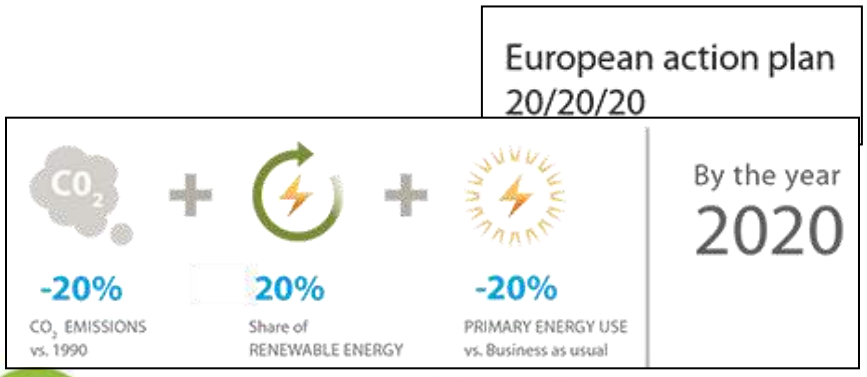
Analysis of Carbon stock and sink

Values of biomass (volume) and increase in class cover have been associated to mapping of forest types

Carbon dioxide stock storage (as volume) have been calculated through the biomass values

The increase in class cover has been used to calculate carbon sinks and carbon dioxide sinks by 2020 *(UE 20-20-20 targets)*

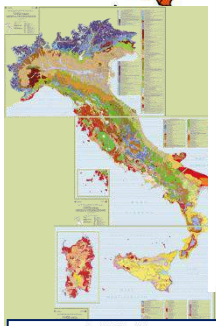


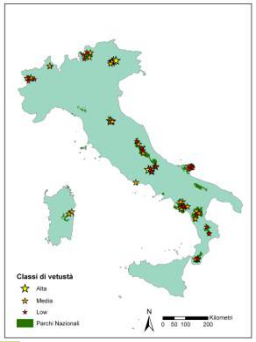


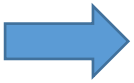
Environmental accounting and National Parks

Appreciating **protected areas** as biodiversity sources with high economic value

Using **ecological land classification** to define landscape characteristics, vulnerability and vocation







SOCIETA'

	SETTORE	TEMATISMO	INDICE	INDICATORE
				Popolazione residente (n°)
				Densità media (n° abitanti /km2)
				Variazione popolazione (assoluta n° e

ECONOMIA

	SETTORE	TEMATISMO	INDICE	INDICATORE
1	Pressione del sistema socio economico locale	Pressione sulle risorse	Intensità turistica	visitatori/popolazione residente (%)
				indice di concentrazione temporale (%)
2	Pressione del sistema socio economico locale	Pressione sulle risorse	Rifiuti Solidi Urbani	produzione di Rifiuti Solidi Urbani (Kg/pro capite)
				raccolta differenziata rifiuti solidi urbani

GOVERNANCE

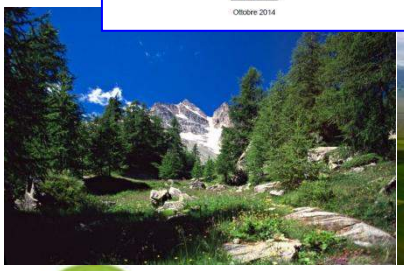
	SETTORE	TEMATISMO	INDICE	INDICATORE
				Comunità del Parco (n. riunioni, n.pareri)

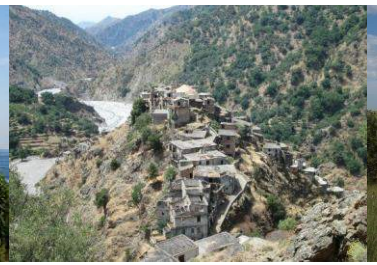
AMBIENTE

	SETTORE	TEMATISMO	INDICE	INDICATORE
1	Capitale naturale	Biodiversità e Risorse genetiche	Ricchezza floristica	Specie endemiche nazionali (n., %, elenco)
			Ricchezza faunistica	Specie endemiche nazionali (n., %, elenco)
			Ricchezza vegetazionale	Tipologie di copertura vegetale (n., %, elenco, scala 1:25.000 o 1:10.000)
			Ricchezza ecosistemica	Superficie ZSC - sic - ZoneA - RNS/Superficie PN
2	Capitale naturale	Biodiversità e Risorse genetiche	Livello di minaccia delle specie vegetali	specie che ricadono nelle categorie della Lista Rossa IUCN (n, %, elenco)
			Livello di minaccia delle specie animali	Specie che ricadono nelle diverse categorie della Lista Rossa IUCN (n,%, elenco)
3	Capitale naturale	Risorse forestali e paesaggistiche	Incendi boschivi	n. incendi e sup annua / n. inc. e sup. inc. ultimi 10 anni
				Superficie totale percorsa dal

PN GRAN PARADISO

	SELEZIONE INDIVIDUATA
HABITAT	9420 Foreste alpine di Larix decidua e/o Pinus cembra
	6150 Formazioni erbose boreo-alpine silicee
	7110* Torbiere alte attive
SPECIE FAUNISTICHE	Gypaetus barbatus
	Capra ibex
	Euphydryas aurinia
SPECIE FLORISTICHE	Trifolium saxatile All.
	Veronica allionii Vill.
	Astragalus alopecurus Pall.
TIPI DI PAESAGGIO	Paesaggio glaciale di alta quota: creste e pinnacoli rocciosi, circhi, selle, soglie, conche, valli a "U", valli sospese, rocce montonate, forme di accumulo glaciale, laghi di circo e laghi di soglia





Monitoring loss of agricultural and natural areas in quali-quantitative terms

Environmental accounting and National Parks

Corine Land Cover 1990

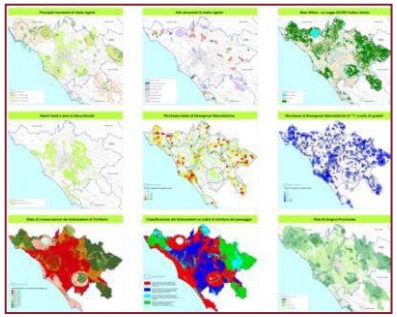
Corine Land Cover 2006

	Parco		Area limitrofe	
	ILC 1990	ILC 2006	ILC 1990	IIC 2006
PN DEL GRAN PARADISO	0,95	0,95	0,89	0,88
PN DELLA VAL GRANDE	0,88	0,88	0,82	0,82
PN DELLO STELVIO	0,96	0,96	0,85	0,84
PN DELLE DOLOMITI BELLUNESI	0,91	0,90	0,81	0,80
PN DELLE CINQUE TERRE	0,78	0,78	0,77	0,77
PN DELL'APPENNINO TOSCO EMILIANO	0,94	0,94	0,84	0,84
PN DELLE FORESTE CASENTINESI, MONTE FALTERONA E CAMPAGNA	0,92	0,92	0,79	0,79
PN DEI MONTI SIBILLINI	0,77	0,80	0,72	0,71
PN DEL GRAN SASSO E MONTI DELLA LAGA	0,87	0,87	0,67	0,67
PN DELLA MAIELLA	0,86	0,86	0,70	0,69
PN D'ABRUZZO, LAZIO E MOLISE	0,92	0,91	0,77	0,77
PN DELL'ARCIPELAGO TOSCANO	0,81	0,81	0,68	0,66
PN DEL CIRCEO	0,68	0,70	0,25	0,25
PN DEL VESUVIO	0,69	0,70	0,28	0,26
PN DEL CILENTO VALLO DI DIANO E ALBURNI	0,82	0,82	0,60	0,60
PN DELL'APPENNINO LUCANO, VAL D'AGRI E LAGONEGRESE	0,87	0,86	0,66	0,65
PN DEL POLLINO	0,82	0,82	0,63	0,64
PN DELLA SILA	0,79	0,79	0,70	0,70
PN DELL'ASPROMONTE	0,86	0,86	0,61	0,61
PN DELL'ASINARA	0,83	0,83		
PN DELL'ARCIPELAGO DE LA MADDALENA	0,72	0,73		
PN DEL GOLFO D'OROSEI E DEL GENNARGENTU	0,89	0,90	0,76	0,76
PN DEL GARGANO	0,73	0,73	0,26	0,26
PN DELL'ALTA MURGIA	0,40	0,42	0,35	0,34

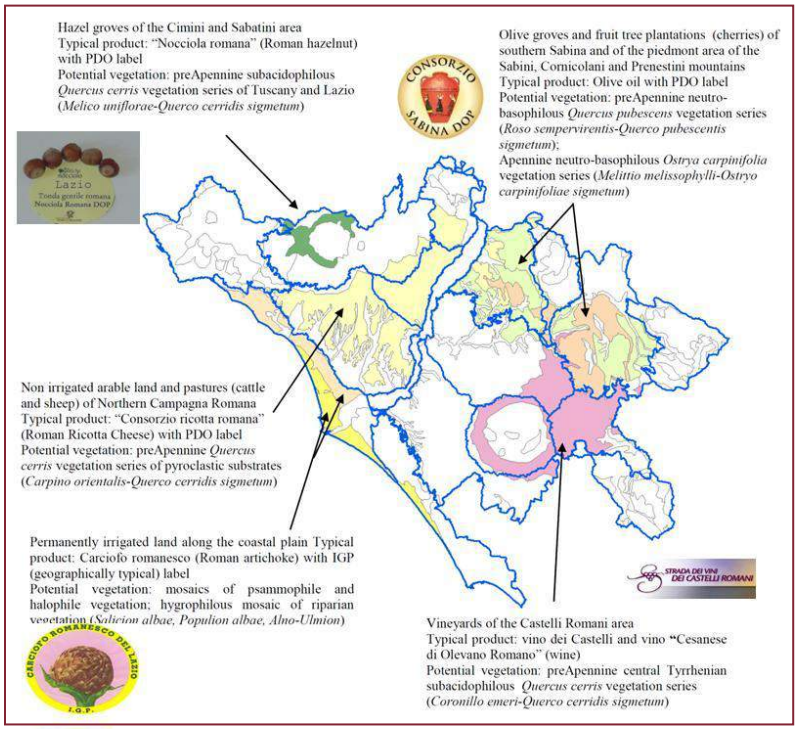
Agrobiodiversity and Green infrastructures

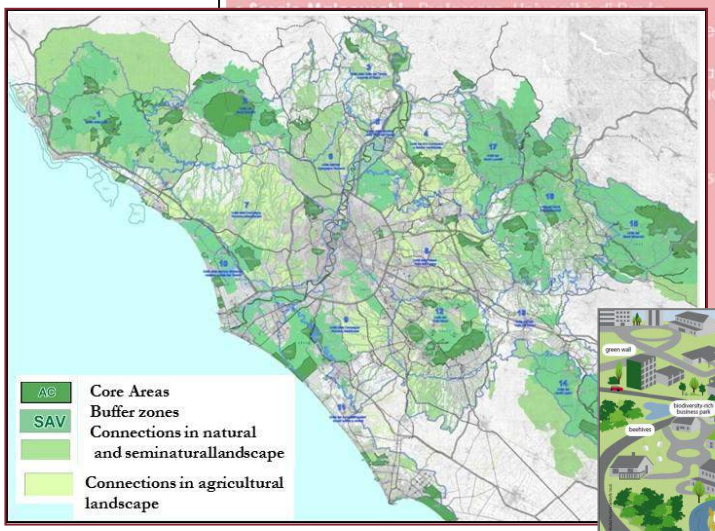
Highlighting the importance of **agrobiodiversity** and of **green infrastructures**

Rome Metropolitan Area



Recognition of areas of floristic, faunistic and habitat concern

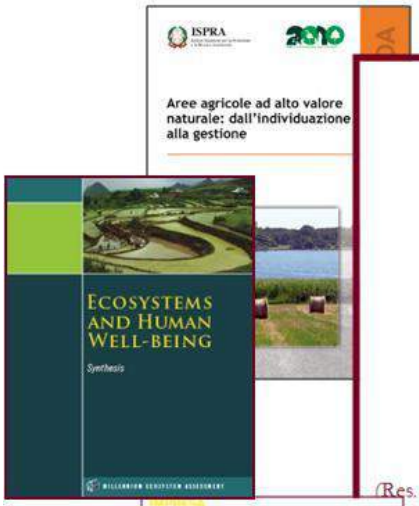


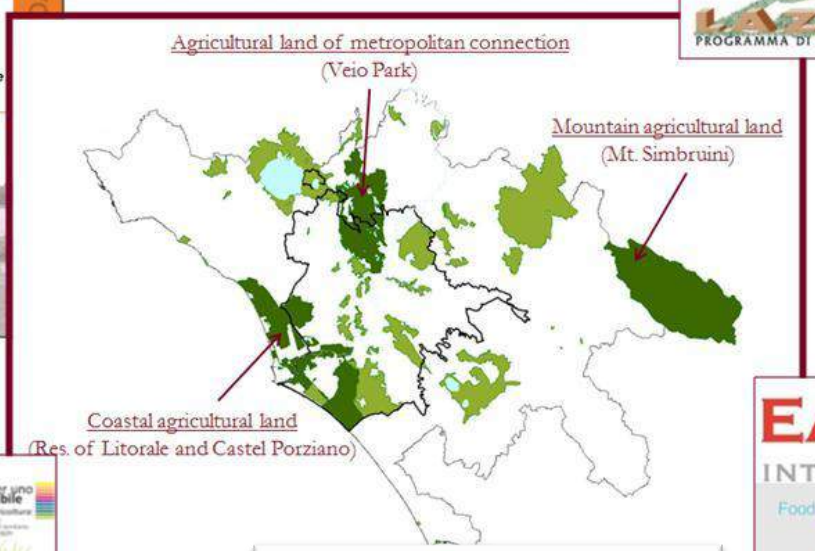


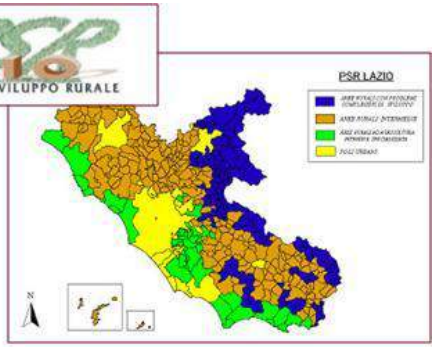
Informing the definition of the Land Ecological Network and weighting the role of agricultural areas

	Node		Landscape connections	
Land cover %	Core Areas	Buffer zones	in natural and seminatural landscapes	in agricultural landscapes
Artificial surfaces	3,8	4	13,4	12,1
Agricultural areas	**13,7**	**31,9**	**51,6**	**84,9**
Forest and semi-natural areas	64,5	63,9	34,3	3,0
Wetlands	0,5	0,1	0,2	0
Water bodies	17,5	0,1	0,5	0
Area (in ha)	44,6	147,0	145,7	68,9
% LEN	11	36	36	17

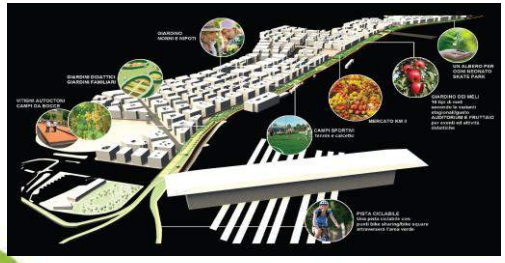
Progetto: Agricoltura e natura in città capitale naturale, green economy, agrobiodiversità, cultura alimentare e benessere umano.







Rete Rurale Nazionale



aree metropolitane
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