

# NATURAL CAPITAL HERITAGE

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## Fourth Report on the State of Natural Capital in Italy

Policy brief

Italian Ministry of Ecological Transition  
and Italian Natural Capital Committee



**This Policy brief has been prepared by**

Italian Natural Capital Committee  
Ministry of Ecological Transition  
Directorate General for Natural Heritage  
Directorate General for Sustainable Growth and Quality of Development.

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***"Ours must be the first generation that leaves natural systems and biodiversity in a better state than they inherited"***

*The vision of the Italian Natural Capital Committee*



## 2021: THE BEGINNING OF THE TEN YEARS TO REVERSE THE ROUTE

*Ecosystems provide the essential resources needed by economic activities*

*A call is needed for a radical cultural and systemic change for a transition to create a more just, healthy, and prosperous society, while ensuring our own survival*

Natural Capital is the entire stock of natural assets, living organisms, air, water, soil, and geological resources, that contribute to providing goods and services of direct or indirect value to humans and to the environment whence they are generated.

According to Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), current extinction rates are 1,000 times higher than natural background rates: we are facing the sixth mass extinction caused, for the first time, by anthropogenic activities.

Nevertheless, five years after the approval of the 2030 Agenda and at the conclusion of the ten-years Global Biodiversity Strategy (2011-2020), the state of global biodiversity keeps worsening.

According to the fifth Global Biodiversity Outlook, released in 2020, none of the Aichi Targets were fully achieved, and only six recorded a partial achievement. Some progress has been made, but not yet enough to ensure that anthropogenic pressure on species and ecosystems will be reduced.

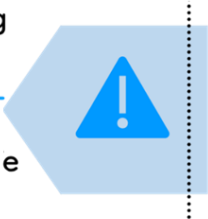
Therefore, the Natural Capital Committee adopted the vision for the post-pandemic recovery and the post-2020 global biodiversity framework: *"ours must be the first generation capable of leaving the natural systems and biodiversity of Italy in a better state than the one we have inherited"*, identifying the aim of achieving, by 2030, the halting of the loss of biodiversity, the reversal of the processes of its degradation and the first results of a great "public work" of restoration of Italian terrestrial and marine environments.

The next ten years will be crucial to concretely put our world on the road to sustainability, respecting what was declared and signed in 2015 by all the countries of the world with the 2030 Agenda and its 17 Sustainable Development Goals to be achieved.

WITH THE AIM  
OF ACHIEVING  
BY 2030

Halting the loss of biodiversity, reversing the processes of its degradation and achieving the first results of a great "public work" of protection and restoration of our terrestrial and marine environments, which are the basis of the welfare and health of all of us and our economy and are able to generate employment

on the safeguarding of biodiversity and **NATURAL CAPITAL** depends the implementation of the 2030 Agenda



Economies and societies are based on the biosphere and its resources



(Folke et al. 2016)

*To mitigate the serious effects of climate change and land consumption, it is urgent to begin a decisive action of restoration of degraded areas.*

In this framework, EU Biodiversity Strategy 2030 outlined incisive actions to reverse the trend over the next decade at European and Member State level: the development of an ambitious plan for nature protection and restoration is urgently needed.

It is now necessary not only to stop nature degradation but also to restore degraded land and its ecological functions. Restoration ecology is a process that use the principles of Nature-Based Solutions and renaturation techniques which help ecosystems to recover their biogeochemical cycles (carbon, water, nitrogen, etc.) after they have been damaged or destroyed.

The EU ecological network Natura 2000 should achieve an extent and level of connectivity among ecosystems so to break up anthropized areas through an uninterrupted green network of protected areas, both terrestrial and marine, to safeguard and improve the ecological state of nature around human settlements and their activities.



## EU Biodiversity Strategy for 2030

### Bringing nature back into our lives

  
reducing the exploitation of marine resources and achieve a good ecological status

**30%**  
at least 30% of the land and 30% of the sea should be protected in the EU

**3**  
planting at least 3 billion additional trees in the EU by 2030


developing an ambitious EU Nature Restoration Plan  
developing a new EU biodiversity governance framework

designating additional protected areas for Natura 2000

  
reducing pollution and pesticide use

**30%**  
reversing the loss trend for vulnerable species, habitats and ecosystems

LEGALLY BINDING EU nature restoration targets to restore degraded ecosystems

  
renewable energy production respecting biodiversity

at least 25,000 km of rivers should be restored into free-flowing rivers

## SAFEGUARDING BIODIVERSITY IS CRUCIAL TO PREVENT PANDEMICS

*Scientific knowledge confirms that if we preserve nature, we preserve ourselves, and if we weaken nature, we weaken ourselves*

Reconsidering current development patterns towards sustainability is a momentous commitment that has been dramatically reinforced by the SARS-CoV-2 pandemic and its devastating effects on all people around the world.

This pandemic is a clear demonstration of the current unhealthy relationship with nature and further highlights the deep interconnection between human health and the health of natural systems.

Therefore, a radical cultural and systemic change is urgently needed, a change that until now our civilization has not been able to implement: a transition to a society and an economic system based on the central importance of nature for the future of all humanity (One Planet - One Health), to create a more just, healthy, and prosperous society, while

## AT THE CROSSROADS OF THE LEGACY WE HAND OVER TO FUTURE GENERATIONS

*Great planetary challenges are forcing people and governments to rethink their relationship with nature and to consider the deep concerns arising from current rates of consumption of natural resources.*

The fifth Global Biodiversity Outlook states that humanity is at a crossroads of the legacy it must leave to future generations.

Biodiversity is declining at an unprecedented level, and the pressures driving this decline are intensifying. Earth's living systems are compromised undermining its contributions to the prosperity of present, younger, and future generations.

The integrated programme of Next Generation EU foresees an unprecedented, concerted spending effort for Europe to implement specific National Recovery and Resilience Plans, dedicating 37% of the resources, deployed by individual states, to climate action, climate change adaptation and biodiversity.

To realize the above vision, actions to restore our ecosystem are critical, which also respond to the commitment outlined by the United Nations Decade on Ecosystem Restoration 2021-2030 and to address the issues of adaptation to ongoing climate change.

Italian Natural Capital Committee believes that it is essential that nature and biodiversity are considered as a central factor for our future. Time is short, but the pandemic has also shown that transformative changes are possible when they must be made.



## THE ECOLOGICAL STATE OF THE ITALIAN NATURAL CAPITAL

*More than 90% of the ecosystems in the Adriatic Ecoregion are at risk and only the 8% of the Po Valley Ecoregion host natural and semi-natural ecosystems*

Recently, the National Ecosystems Red List has been published. The list has been realized following the IUCN criteria for the assessment of the threatened terrestrial eco-systems' degree at national level, through the creation of databases and cartographic documents.

The risk assessment, based on quantitative criteria designed to reflect the variation of the degrees of threat, outlined an ecosystems mapping, named of the "Ecosystem Map of Italy V2.0", of 85 ecosystem types at the national level.

Given the high environmental heterogeneity of the country, risk assessments for each mapped ecosystem were carried out within specified ecological areas, defined as Ecoregions (Alpine, Po Valley, Apennine, Tyrrhenian, and Adriatic).

The five Ecoregions were identified as reference territorial contexts within which to integrate local knowledge on pressures and critical conditions for ecosystems. Results are summarized in the Table below.

There are 29 ecosystems at high risk related to intensive anthropogenic activities and they are mainly coastal, wet, and plain ecosystems. For instance, in the Po Valley Ecoregion, only the 8% of the whole area host natural and semi-natural ecosystems.

Italian forest ecosystems have an extraordinary richness of tree species and represent a hot spot of biodiversity resulting from the environmental variability and natural history typical of the Mediterranean region. National forest ecosystems are among the most biodiverse in Europe; about 45% of Italian forests are composed of 4-5 different tree species and about 25% of 6 or more tree species, one of the highest values of forest biological diversity in Europe.

- Alpine Ecoregion
- Po Valley Ecoregion
- Apennine Ecoregion
- Tyrrhenian Ecoregion
- Adriatic Ecoregion



ECOREGIONAL STATUS	ECOREGION				
	ALPINE	PO VALLEY	APPENNINE	TYRRHENIAN	ADRIATIC
Critically Endangered - CE	1	5	-	1	2
Endangered - EN	5	7	3	8	5
Vulnerable - VU	7	4	5	19	6
Near Threatened - NT	7	-	10	5	1
Least Concern - LC	2	-	1	1	-
Number of ecosystems at risk (VU+EN+CE)	13	16	8	28	13
Number of ecosystems per Ecoregion	22	16	19	34	14
Percentage of ecosystems at risk (VU+EN+CE)	59%	100%	42%	82%	93%

*Annually Italian forests absorb the 12% of all national carbon dioxide emissions.*

*Several species are living the extinction dealing with habitat loss.*

Over the last 70 years, Italian forests have expanded, especially in mountainous areas, reaching an extension of 12 million hectares, equal to almost 40% of the national total area.

Total amount of carbon stocked in Italian forest ecosystems is equal to 4.5 billion tons and annually, as a result of the tree growth, 46.2 million tons of carbon dioxide are fixed from the atmosphere, or 12% of all Italian emissions.

Forests are also important in urban areas to mitigate climate change and reduce air pollution improving health and preventing infringement proceedings.

To protect biodiversity and ecosystem services, the Natural Capital Committee recommends an urban reforestation action using native trees and shrubs, according to Potential Natural Vegetation (PNV) and to an established list for each urban area and regional area based on biogeography, ecology, lithomorphological data, and climate, at a local scale.

The Fourth Report also evaluated data on the state of conservation of birds at a national level. Several species are living an ecological crisis, linked above all to the reduction or completed loss of their habitats. 63% of the bird species breeding in Italy are in a poor or inadequate state of conservation, while the recent National Red List classified 72 species (i.e., 25.9% of the assessed species) at risk of extinction, of which 10 are critically endangered, 39 endangered and 23 vulnerable.

High-altitude grasslands are particularly threatened by climate warming and tree line advance; wetlands remain under threat since water unsustainable use, disrupted flows from dams, soil sealing and soil erosion upstream; forests, although they have increased, are not always in good ecological condition but still affected by fire, storms and epidemics; finally marine and coastal ecosystems are threatened by soil sealing, unsustainable tourism, plastic pollution and depletion of fish stock.

*Posidonia oceanica* forms large underwater meadows along the Italian coastal perimeter, generating important ecosystem services, such as the protection of coastlines from erosion, nursery habitat for juveniles of marine species, and climate regulation by storing the so-called "coastal blue carbon".

Nonetheless, 30% of underwater meadows have been lost over the past century, resulting in a loss of carbon sequestration service, estimated at about 226,000 tons per year of sequestered carbon.



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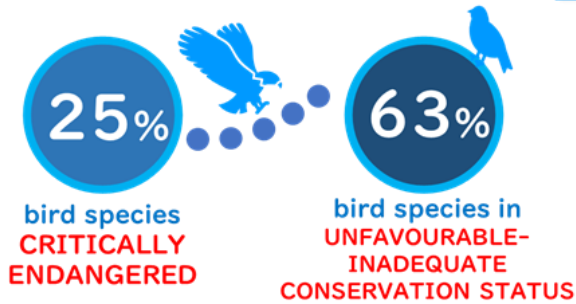
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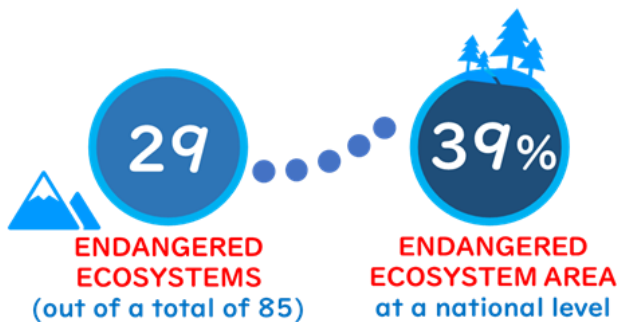
## THE ECOLOGICAL STATE OF ITALIAN NATURAL CAPITAL RESULTS FROM THE FOURTH ANNUAL REPORT



**PARTICULARLY EN-DANGERED**  
Passeriform bird and species living in wetlands and extensive agriculture areas

### IMPACTS & THREATS

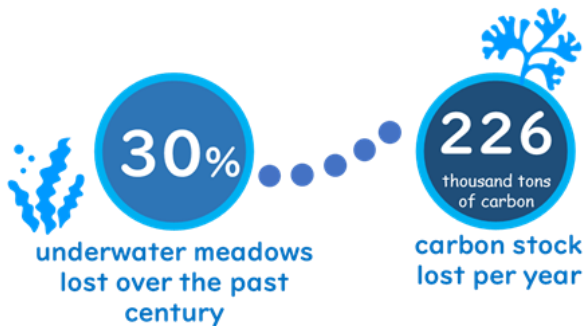
habitat loss, wetland degradation, abandoning traditional agricultural practices, pesticide use, illegal and excessive hunting, impacting linear infrastructure



**PARTICULARLY ENDANGERED**  
Adriatic and Po Valley Ecoregion

### IMPACTS & THREATS

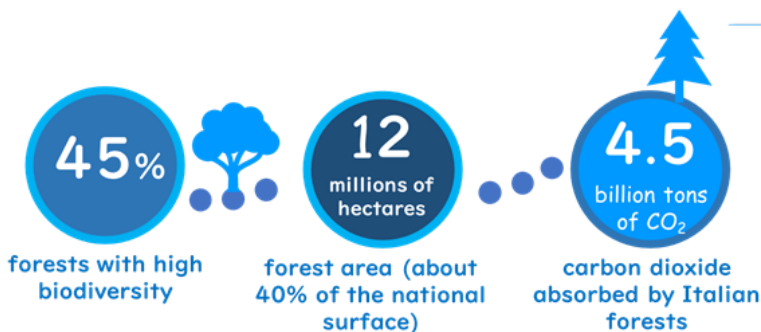
decreasing of geographic distribution, fragmentation, reduction of interactions among ecosystems, degradation of abiotic environment and biotic processes



**PARTICULARLY ENDANGERED**  
Strait of Sicily and Southern Adriatic

### IMPACTS & THREATS

direct anthropogenic pressures, physical removal of seagrasses, eutrophication, climate change



The **ANNUAL FOREST INCREMENTATION** is equal to 0.2%.

**NATIONAL PARKS** are the areas with the highest tree density index

### IMPACTS & THREATS

natural disturbances, fires, insect epidemics, windstorms

## BIOPHYSICAL AND ECONOMIC VALUATION OF ECOSYSTEM SERVICES

*Accounting for ecosystem services can be used to guide socio-economic needs within the bounds of environmental sustainability.*

Economic prosperity and well-being depend on the good state of Natural Capital, and its goods and services. Accounting for ecosystem services can be used as an assessment tool for calibrating the socio-economic needs within the limits imposed by the sustainable use of ecosystems, thus providing useful information to the policy maker who must preserve the natural system.

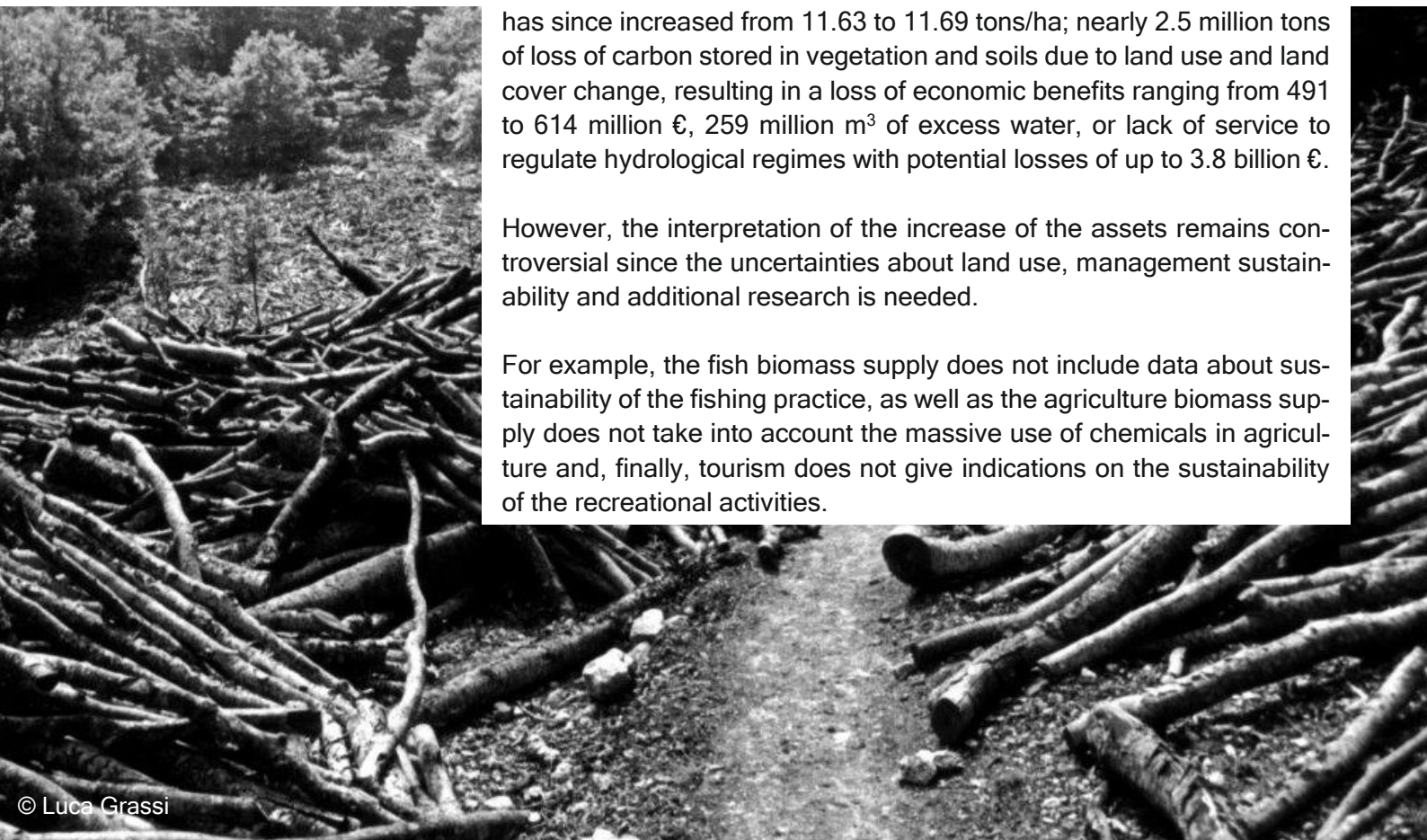
The biophysical valuation is then translated into monetary units using valuation methods consistent with the System of National Accounts. Methodology depending on the ecosystem service and its physical and use features.

The Fourth Report analyzed 12 ecosystem services (woody biomass supply, agricultural, fish, water availability, pollination, flood risk regulation, erosion protection, hydrological regime regulation, water purification by soils, habitat quality, carbon sequestration and storage, and recreational tourism) and their change between 2012 and 2018.

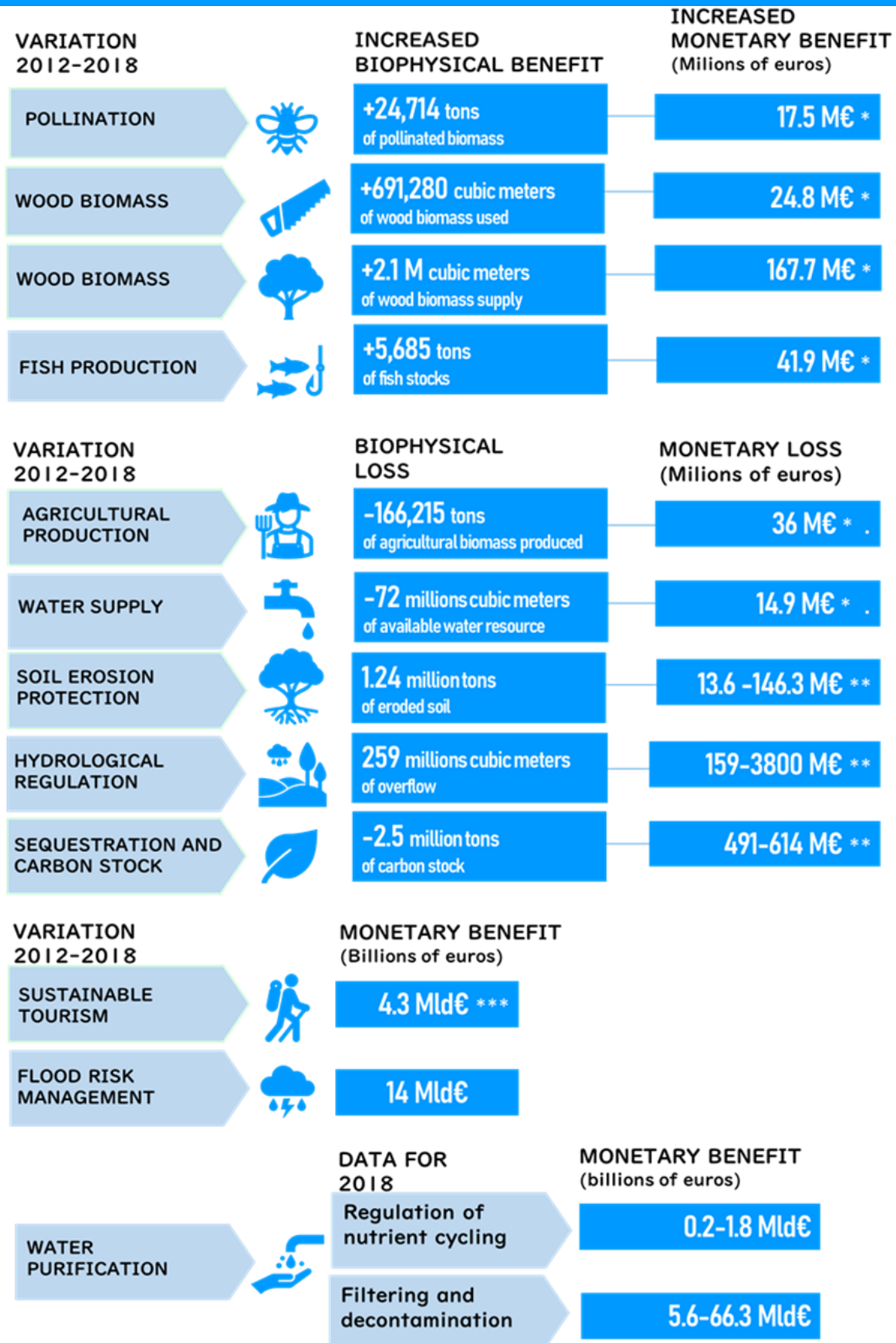
Estimates show, over a period of six years, decreases in the flow of many of the ecosystem services analyzed, negatively impacting the economic values dependent on them: 72 million m<sup>3</sup> less water resource recharged into aquifers as of 2018 compared to the base year; up to 146 million € in economic losses associated with increased soil erosion that has since increased from 11.63 to 11.69 tons/ha; nearly 2.5 million tons of loss of carbon stored in vegetation and soils due to land use and land cover change, resulting in a loss of economic benefits ranging from 491 to 614 million €, 259 million m<sup>3</sup> of excess water, or lack of service to regulate hydrological regimes with potential losses of up to 3.8 billion €.

However, the interpretation of the increase of the assets remains controversial since the uncertainties about land use, management sustainability and additional research is needed.

For example, the fish biomass supply does not include data about sustainability of the fishing practice, as well as the agriculture biomass supply does not take into account the massive use of chemicals in agriculture and, finally, tourism does not give indications on the sustainability of the recreational activities.



## PHYSICAL AND MONETARY VALUATIONS OF ECOSYSTEM SERVICES RESULTS FROM THE FOURTH ANNUAL REPORT



\*Values produced / yield of the resource; \*\* Predicted additional costs; \*\*\* Expenditure for using

## ORIENTING FINANCE AND TAXATION TO PROTECT NATURAL CAPITAL

*Biodiversity finance is the practice of raising and managing capital and financial incentives to protect and restore biodiversity and Natural Capital.*

Recent OECD assessments estimate that global biodiversity funding amounts to 78-91 billion \$ per year, compared to an estimated 140-440 billion \$ per year needed to close the funding gap for biodiversity conservation (defined in relation to the achievement of the Aichi Targets).

Confirming the critical role of resource mobilization in ensuring adequate funding for the Aichi Targets, the Convention on Biological Diversity has adopted several instruments aimed at increasing funding for biodiversity.

**RESOURCE PLANNING** - The international debate clearly demonstrates the growing interest about sustainable finance even in contexts where it was not previously discussed. What once was considered a limitation for public and private finance is now beginning to be seen as an opportunity for economic resilience and prosperity. Enabling policy and regulatory frameworks has intensified in recent years, but there is still a need for resource planning based on the achievement of the SDGs of the 2030 Agenda, and within national strategies for sustainable development, climate, and biodiversity, including sustainable finance and resource mobilization strategies.

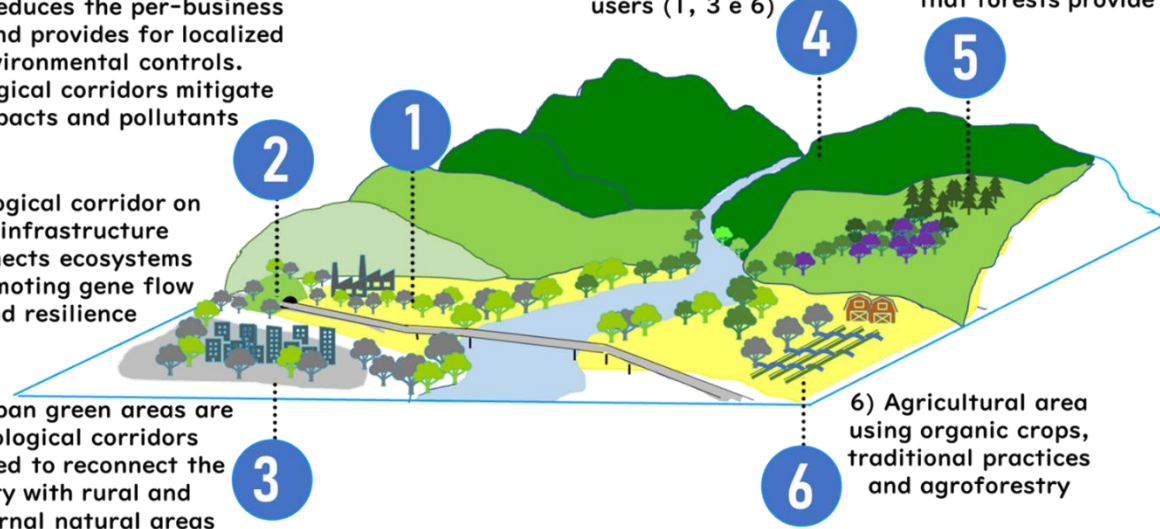
**CLIMATE AND BIODIVERSITY FINANCING SOLUTIONS** - New efforts are needed to identify mechanisms that complement traditional financing sources with innovative financial instruments in a longer-term view; several financial sector challenges remain as to guarantee the access to finance, especially small and medium-sized enterprises, even considering microcredit systems to ensure environmental sustainability together with social and economic sustainability. In this way, the **UNDP-BIOFIN Catalogue** provides more than 150 financing solutions for sustainable activities, both public and private (e.g. carbon markets, mitigation banks) to be considered and adopted also within national biodiversity and climate resource mobilization plans.



# NATURAL CAPITAL

## ENVIRONMENTAL PLANNING AT LANDSCAPE SCALE

- 1) Concentrating industrial area reduces the per-business cost and provides for localized environmental controls. Ecological corridors mitigate impacts and pollutants
- 2) Ecological corridor on grey infrastructure reconnects ecosystems by promoting gene flow and resilience
- 3) Urban green areas are ecological corridors needed to reconnect the city with rural and external natural areas



4) Water sources managed with protection policies and funded with, inter alia, water royalties, tariffs and payment to ecosystem services by users (1, 3 e 6)

5) Forests managed with the Sustainable Forest Management criteria and climate smart forestry to increase benefits that forests provide

6) Agricultural area using organic crops, traditional practices and agroforestry

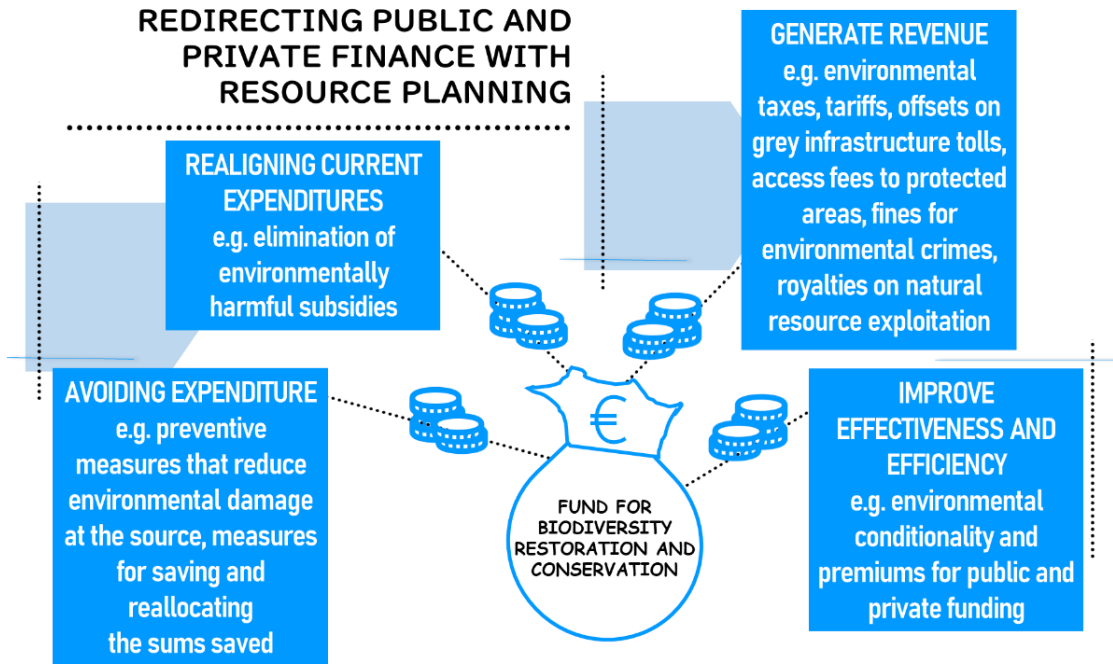
*Careful management and planning at a landscape level should be adopted to sustainably calibrate the upcoming extraordinary monetary efforts and activities needed.*

**TAX POLICY AND FISCAL REFORM** are among the main tools for sustainable public financing able to leverage the private sector all over the transition. Tax expenditures could be reviewed and all forms of incentives harmful to environment, biodiversity, and climate, starting with fossil fuel subsidies, should be removed, progressively but with certainty.

**A NEW COORDINATION OF ECONOMIES** - A coordination among Green Economy activities, Ecosystem Restoration activities and Circular Economy activities should be encouraged, as much as possible, also in view of supporting the green jobs transition.

**THE GOVERNANCE** - A strengthened governance must be ensured to achieve, despite tight timelines, an appropriate level of science-based knowledge and involvement of capacities in both ecological sciences and environmental economics in the sustainable finance sector.

### REDIRECTING PUBLIC AND PRIVATE FINANCE WITH RESOURCE PLANNING



*In the year of the COP15 on biological diversity, the achievement of the Aichi target 3 should be verified: it provides for the elimination, by 2020, of incentives, including subsidies, harmful to biodiversity.*

**A BROAD SHARED FRAMEWORK FOR SUSTAINABLE FINANCE** - Alignment among environmental objectives and resource mobilization would provide sustainable finance with, inter alia, a better reporting activity and a measuring progress and transparency framework. Resource planning is also strictly connected with the definition of the technical screening criteria for economic activities in line with a Taxonomy for sustainable investment and activities (see e.g. the EU Regulation, China's Taxonomy) and the Do Not Significant Harm principle.

Criteria are crucial for establishing a sustainable result-based conditionality (e.g. credit access or manager bonus) and, hence, for the adoption of non-financial disclosure and voluntary certification systems; considering that accountability facilitates investments, a virtuous circle of improved transparency and efficiency arises, allowing governments and communities to receive benefit from the private sector in sustaining the ecological transition.

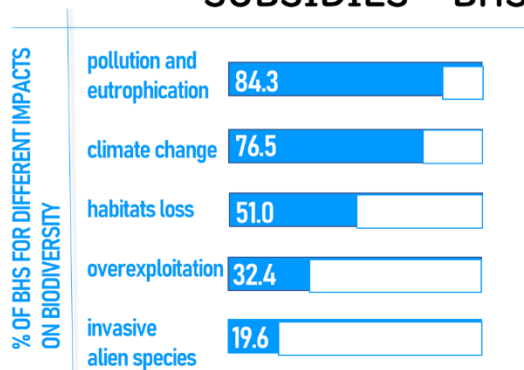
In 2015, Italy launched a "Catalogue of environmentally harmful subsidies and environmentally favourable subsidies" or more briefly Catalogue of Environmental Subsidies (CSA), established at the Ministry for Ecological Transition.

Starting from the information base of the CSA3, the harmful and favourable subsidies for biodiversity have been identified using the method of the Institute for European Environmental

Policy (IEEP) and keeping as a reference for the assessment the principle Do No Significant Harm (DNSH). According to the latter, economic activities to be considered environmentally sustainable must contribute substantially to the achievement of at least one of the six environmental objectives (provided for in Reg. (EU) 2020/852) without causing damage to any of the other five.

Using the IEEP and DNSH criteria, giving priority to the Natural Capital issues, biodiversity harmful subsidies (BHS) are estimated at about 28 billion € for the year 2018.

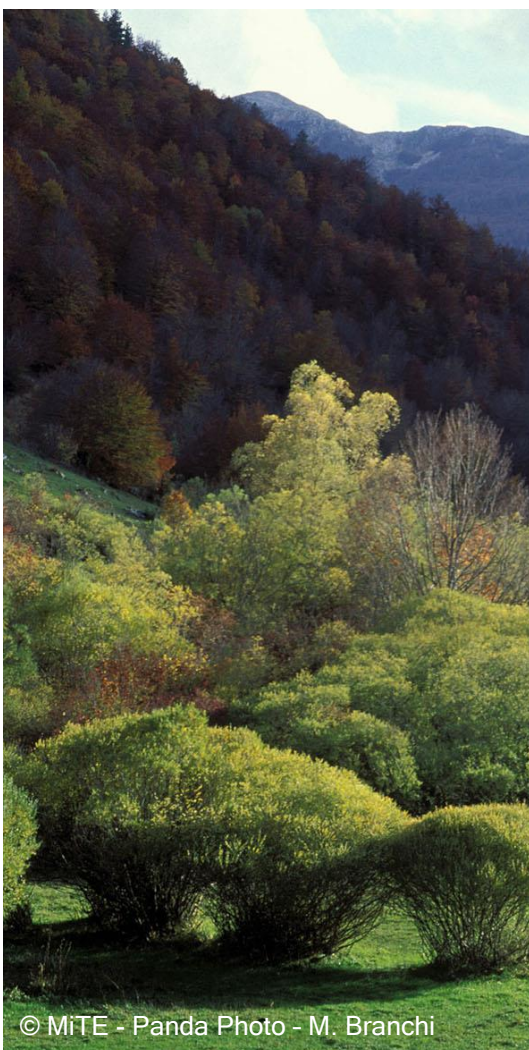
### BIODIVERSITY HARMFUL SUBSIDIES - BHS



**28**  
Mld€

**THE BIODIVERSITY HARMFUL SUBSIDIES FOR THE YEAR 2018**

(estimated using the Institute for European Environmental Policy - IEEP method and DNSH criteria)



# ITALIAN NATURAL CAPITAL

## PRIORITY ACTIONS



### HALT SOIL CONSUMPTION

Use all legal, regulatory, and legislative tools to achieve land degradation neutrality



### RESTORE DEGRADED AREAS

Recover and restore coastal, marine, wetland and lowland ecosystems, and foster urban and river regeneration, offsets, and mitigation using the principles of restoration ecology



### RECONNECTING ECOSYSTEMS

Complete and effectively manage the Natura 2000 network with new sites, especially marine, urban forestation, and fragmenting grey infrastructure with new ecological corridors



### NATURAL CAPITAL MONITORING

Keep strengthening biodiversity and Natural Capital monitoring, finalize the national forest inventory, and enhance fauna and avifauna monitoring programs



### SUSTAINABLE ECONOMIC ACTIVITIES AND GREEN JOBS

Support new job opportunities and activities in the circular economy, ecosystem remediation and recovery, decarbonization, and natural capital monitoring



### RESOURCE PLANNING

Assess and redirect finance, public and private, towards Natural Capital conservation, using e.g. tax reform and elimination of environmental harmful subsidies, carbon market, mitigation bank, tariffs, royalties, blue and green bonds



